

Classification of Animals

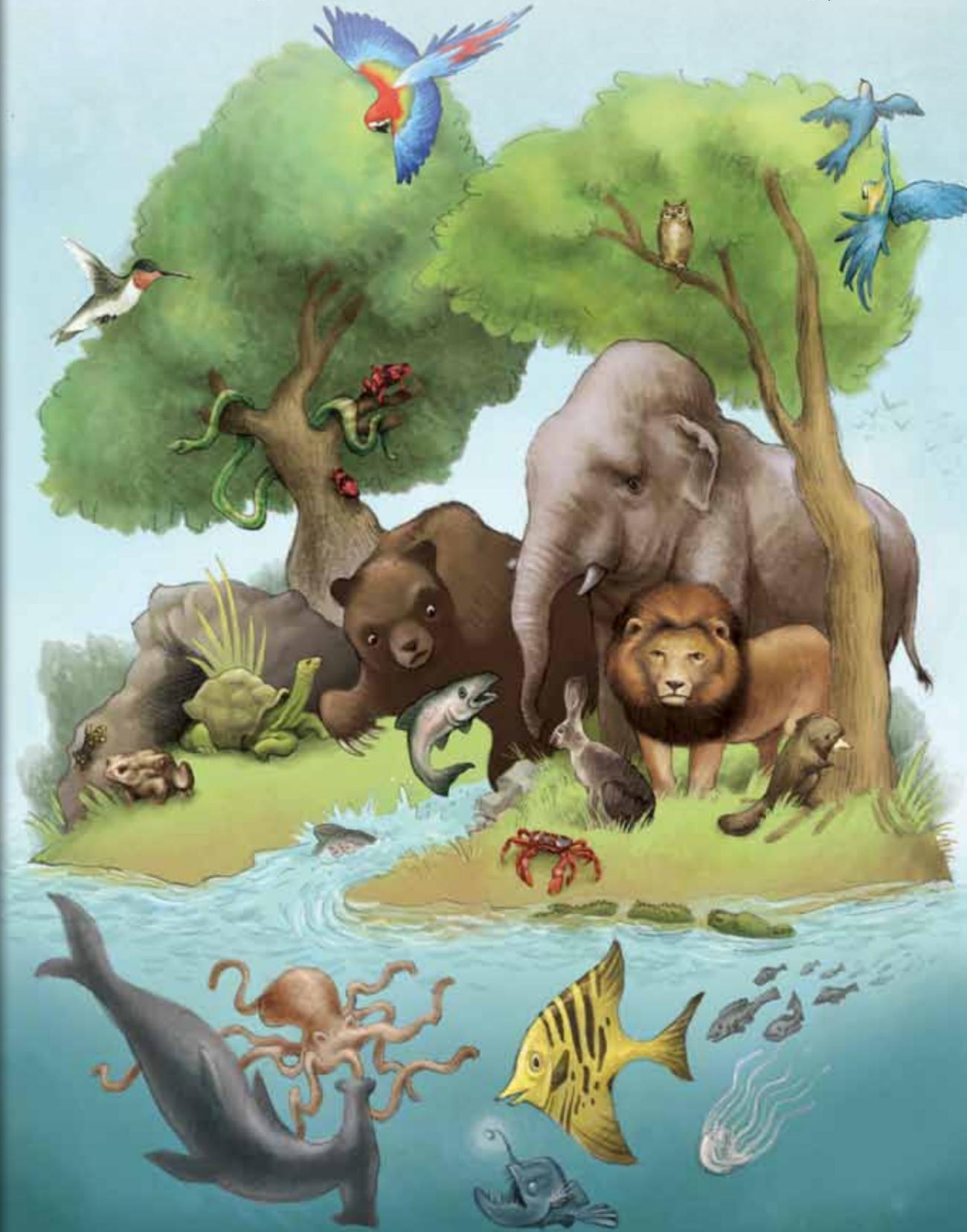
Tell It Again!™ Read-Aloud Anthology

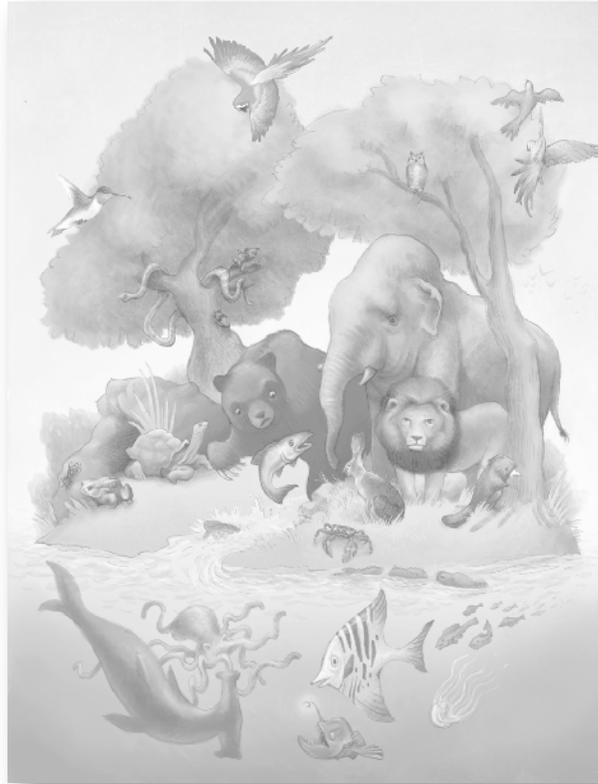
Core Knowledge Language Arts® • Listening & Learning™ Strand



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GRADE 3





Classification of Animals

Tell It Again![™] Read-Aloud Anthology

Listening & Learning[™] Strand

GRADE 3

Core Knowledge Language Arts[®]



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Alignment Chart for Classification of Animals

The following chart contains core content objectives addressed in this domain. It also demonstrates alignment between the Common Core State Standards and corresponding Core Knowledge Language Arts (CKLA) goals.

Alignment Chart for Classification of Animals

Core Content Objectives	Lesson								
	1	2	3	4	5	6	7	8	9
Observe and describe basic characteristics of an animal	✓	✓	✓	✓	✓	✓	✓	✓	✓
Explain that scientists classify animals by common or shared characteristics	✓	✓	✓	✓	✓	✓	✓	✓	✓
Explain that scientists classify animals in order to study them and show relationships	✓	✓	✓	✓	✓	✓	✓	✓	✓
Demonstrate familiarity with the poem “The Crocodile”		✓							
Identify cold-blooded/warm-blooded and vertebrate/invertebrate as important characteristics used to classify animals	✓	✓	✓						✓
Describe basic characteristics of vertebrate/invertebrate animals	✓		✓						✓
Classify particular animals as vertebrates or invertebrates	✓		✓	✓	✓	✓	✓	✓	✓
Describe basic characteristics of cold-blooded/warm-blooded animals		✓	✓						✓
Classify particular animals as cold-blooded or warm-blooded		✓	✓	✓	✓	✓	✓	✓	✓
Identify fish, amphibians, reptiles, birds, and mammals as groups of vertebrates	✓	✓	✓	✓			✓		✓
Identify basic characteristics of fish, amphibians, reptiles, birds, and mammals		✓	✓	✓	✓	✓	✓	✓	✓
Classify particular animals as fish, amphibians, reptiles, birds, or mammals	✓		✓	✓	✓	✓	✓	✓	✓
Compare and contrast two groups of vertebrates				✓	✓	✓	✓	✓	✓
Identify insects as invertebrates	✓	✓	✓						✓
Identify insects as the most numerous group of animals that have currently been identified	✓	✓	✓						✓
Explain that there are a large number of animals that have not yet been identified	✓		✓						

Lesson

**Alignment Chart for
Classification of Animals**

1	2	3	4	5	6	7	8	9
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Reading Standards for Informational Text: Grade 3

Key Ideas and Details

STD RI.3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.								
CKLA Goal(s)	Ask and answer questions (e.g., <i>who, what, where, when, why, how</i>), orally or in writing, requiring literal recall and understanding of the details and/or facts of a nonfiction/informational read-aloud					✓			
	Ask and answer questions, orally or in writing, that require making interpretations, judgments, or giving opinions about what is heard in a nonfiction/informational read-aloud, including asking and answering <i>why</i> questions that require recognizing or inferring cause/effect relationships						✓		
STD RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.								
CKLA Goal(s)	Determine the main idea of a nonfiction/informational read-aloud; recount the key details and explain how they support the main idea							✓	

Craft and Structure

STD RI.3.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a Grade 3 topic or subject area.								
CKLA Goal(s)	Determine the literal and nonliteral meanings of and appropriately use common sayings and phrases					✓		✓	✓
	Determine the meaning of general academic and domain-specific words and phrases in a nonfiction/informational read-aloud relevant to a Grade 3 topic or subject area					✓			
STD RI.3.6	Distinguish their own point of view from that of the author of a text.								
CKLA Goal(s)	Distinguish their own point of view from that of the author of a text	✓							✓

Lesson

**Alignment Chart for
Classification of Animals**

1	2	3	4	5	6	7	8	9
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Integration of Knowledge and Ideas

STD RI.3.7	Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).									
CKLA Goal(s)	Describe images, orally or in writing, and how they contribute to what is conveyed by the words in a nonfiction/informational read-aloud (e.g., where, when, why, and how key events occur)									
	Use images (e.g., maps, photographs) accompanying a nonfiction/informational read-aloud to check and support understanding									
	Interpret information from diagrams, charts, graphs, and/or graphic organizers									
STD RI.3.9	Compare and contrast the most important points and key details presented in two texts on the same topic.									
CKLA Goal(s)	Compare and contrast the most important points and key details presented in two nonfiction/informational read-alouds on the same topic									

Writing Standards: Grade 3

Text Types and Purposes: Informative/Explanatory

STD W.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.									
STD W.3.2a	Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.									
CKLA Goal(s)	Identify and use parts of a paragraph, including a topic sentence, supporting details, and a concluding statement, in an informative/explanatory piece									
	Introduce a topic and group related information together; include illustrations when useful to aiding comprehension									
STD W.3.2b	Develop the topic with facts, definitions, and details.									
CKLA Goal(s)	Develop an informative/explanatory topic with clearly presented ideas, facts, and details									
STD W.3.2c	Use linking words and phrases (e.g., <i>also</i> , <i>another</i> , <i>and</i> , <i>more</i> , <i>but</i>) to connect ideas within categories of information.									
CKLA Goal(s)	Use linking words and phrases (e.g., <i>also</i> , <i>another</i> , <i>and</i> , <i>more</i> , <i>but</i>) to connect ideas within categories of information									
STD W.3.2d	Provide a concluding statement or section.									
CKLA Goal(s)	Provide a concluding statement or section for an informative/explanatory piece									

Lesson

**Alignment Chart for
Classification of Animals**

1	2	3	4	5	6	7	8	9
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Production and Distribution of Writing

STD W.3.4	With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in Standards 1–3 above.)									
CKLA Goal(s)	With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose, i.e., ideas and paragraphs presented clearly and in a logical order									
STD W.3.5	With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language Standards 1–3 up to and including Grade 3 on pages 28 and 29.)									
CKLA Goal(s)	With guidance and support from peers and adults, use the writing process of plan, draft, edit, and publish to develop and strengthen writing								✓	✓
STD W.3.6	With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.									
CKLA Goal(s)	Share writing with others									
CKLA Goal(s)	With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others**									✓

Research to Build and Present Knowledge

STD W.3.7	Conduct short research projects that build knowledge about a topic.									
CKLA Goal(s)	Conduct short research projects that build knowledge about a topic								✓	✓
STD W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.									
CKLA Goal(s)	Make personal connections (orally or in writing) to events or experiences in a fiction or nonfiction/informational read-aloud, and/or make connections among several read-alouds	✓	✓	✓	✓			✓	✓	✓
CKLA Goal(s)	Gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories				✓	✓	✓	✓	✓	✓
CKLA Goal(s)	Categorize and organize facts and information within a given domain									

**Alignment Chart for
Classification of Animals**

Lesson

1	2	3	4	5	6	7	8	9
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STD W.3.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.									
CKLA Goal(s)	Write responses to fiction and nonfiction/informational read-alouds that demonstrate understanding of the text and/or express/support opinion, using examples from a text and distinguishing own point of view from that of the author, narrator, or characters (short time frame)									
	With guidance and support from peers and adults, use the writing process of plan, draft, edit, and publish to develop and strengthen writing (extended time frame)								✓	✓
	Write sentences to represent the main idea and details from a fiction or nonfiction/informational read-aloud (short time frame)									

Speaking and Listening Standards: Grade 3

Comprehension and Collaboration

STD SL.3.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on Grade 3 topics and texts, building on others' ideas and expressing their own clearly.									
STD SL.3.1a	Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.									
CKLA Goal(s)	Carry on and participate in a conversation with an adult or peer for at least six turns, staying on topic, building on others' ideas, and expressing their own ideas clearly									
	Demonstrate preparedness for a discussion, having read or studied required material, explicitly drawing on preparation and other information known about the topic to explore content under discussion									
	Prior to listening to a read-aloud, identify (orally or in writing) what they know and have learned that may be related to the specific read-aloud or topic									
	Make predictions (orally or in writing) prior to and during a read-aloud, based on the title, images, and/or text heard thus far, and then compare the actual outcomes to predictions		✓	✓	✓	✓				✓
STD SL.3.1b	Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).									
CKLA Goal(s)	Use agreed-upon rules for group discussions, i.e., look at and listen to the speaker, raise hand to speak, take turns, say "excuse me" or "please," etc.									

Lesson

**Alignment Chart for
Classification of Animals**

1	2	3	4	5	6	7	8	9
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STD SL.3.1c	Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.								
CKLA Goal(s)	Interpret information presented, and then ask questions to clarify information or the topic in a fiction or nonfiction/informational read-aloud				<input checked="" type="checkbox"/>				
STD SL.3.1d	Explain their own ideas and understanding in light of the discussion.								
CKLA Goal(s)	During a discussion, explain ideas and understanding in relation to the topic				<input checked="" type="checkbox"/>				
STD SL.3.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.								
CKLA Goal(s)	Ask and answer questions to clarify directions, exercises, and/or classroom routines and/or what a speaker says about a topic to gather additional information or deepen understanding of a topic or issue				<input checked="" type="checkbox"/>				

Presentation of Knowledge and Ideas

STD SL.3.4	Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.								
CKLA Goal(s)	Summarize (orally or in writing) read-aloud content and/or oral information presented by others				<input checked="" type="checkbox"/>				
	Retell (orally or in writing) important facts and information from a fiction or nonfiction/informational read-aloud				<input checked="" type="checkbox"/>				
STD SL.3.6	Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. (See Grade 3 Language Standards 1 and 3 on pages 28 and 29 for specific expectations.)								
CKLA Goal(s)	Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification				<input checked="" type="checkbox"/>				

Language Standards: Grade 3

Knowledge of Language

STD L.3.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.								
STD L.3.3a	Choose words and phrases for effect.*								
CKLA Goal(s)	Choose words and phrases for effect	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				

Vocabulary Acquisition and Use

STD L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on Grade 3 reading and content, choosing flexibly from a range of strategies.								
STD L.3.4a	Use sentence-level context as a clue to the meaning of a word or phrase.								
CKLA Goal(s)	Use sentence-level context as a clue to the meaning of a word or phrase				<input checked="" type="checkbox"/>				

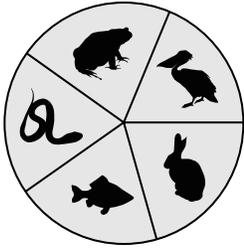
**Alignment Chart for
Classification of Animals**

Lesson

		1	2	3	4	5	6	7	8	9
STD L.3.4b	Determine the meaning of the new word formed when a known affix is added to a known word (e.g., <i>agreeable/disagreeable, comfortable/uncomfortable, care/careless, heat/preheat</i>).									
CKLA Goal(s)	Determine the meaning of the new word formed when a known affix is added to a known word (e.g., <i>agreeable/disagreeable, comfortable/uncomfortable, care/careless, heat/preheat</i>)						✓			
STD L.3.4c	Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., <i>company, companion</i>).									
CKLA Goal(s)	Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., <i>company, companion</i>)	✓	✓		✓	✓			✓	
STD L.3.5	Demonstrate understanding of word relationships and nuances in word meanings.									
STD L.3.5a	Distinguish the literal and nonliteral meanings of words and phrases in context									
CKLA Goal(s)	Determine the literal and nonliteral meanings of and appropriately use common sayings and phrases					✓		✓	✓	
	Distinguish literal language from figurative language as used in a fiction or nonfiction/informational read-aloud					✓		✓	✓	
STD L.3.5b	Identify real-life connections between words and their use (e.g., describe people who are <i>friendly</i> or <i>helpful</i>).									
CKLA Goal(s)	Provide and/or use synonyms and antonyms				✓				✓	
	Identify real-life connections between words and their use (e.g., describe people who are <i>friendly</i> or <i>helpful</i>)						✓			
Additional CKLA Goals										
CKLA Goal(s)	Listen to and understand a variety of texts, including informational texts and poems					✓				
	Draw illustrations to represent the main idea and/or details from a nonfiction/ explanatory read-aloud or to enhance a piece of writing		✓		✓	✓	✓	✓	✓	✓

 These goals are addressed in all lessons in this domain. Rather than repeat these goals as lesson objectives throughout the domain, they are designated here as frequently occurring goals.

- * Skills marked with an asterisk (*) in Language Standards 1–3 are particularly likely to require continued attention in higher grades as they are applied to increasingly sophisticated writing and speaking.
- ** The editing and publishing steps of the informative writing piece have been placed at the beginning of Pausing Point 2. It is highly recommended that this first section of Pausing Point 2 be regarded as *required* in order to most accurately align with the writing requirements of the Common Core State Standards.



Introduction to Classification of Animals

This introduction includes the necessary background information to be used in teaching the *Classification of Animals* domain. The *Tell It Again! Read-Aloud Anthology for Classification of Animals* contains nine daily lessons, each of which is composed of two distinct parts—the Read-Aloud and the Extension—so that the lessons may be divided into smaller chunks of time and presented at different intervals during the day. Each entire lesson will require a total of seventy minutes.

In addition to these lessons, there are two Pausing Points in this domain: one after Lesson 5, and another after Lesson 9. These Pausing Points are designed to allow four total days for reviewing, reinforcing, or extending the material taught up to that point. Two days are included for the Domain Assessment, additional review and reassessment as needed, and extension of the writing process. **You should spend no more than fifteen days total on this domain.**

Domain Overview

Here is an overview of the domain schedule for *Classification of Animals*. Please see the Unit 2 Teacher Guide for the corresponding Skills schedule.

Week One							
Min.	Day 1	#	Day 2	Day 3	#	Day 4	Day 5
50	Lesson 1: “Classifying Animals by Characteristics”		Lesson 2: “Cold-Blooded and Warm-Blooded Animals”	Lesson 3: “Vertebrate Animals”		Lesson 4: “Fish: Fins and Gills”	Lesson 5: “Amphibians: From Water to Land”
20	Lesson 1B: Extensions		Lesson 2B: Extensions	Lesson 3B: Extensions	#	Lesson 4B: Extensions	Lesson 5B: Extensions

Week Two							
Min.	Day 6	#	Day 7	Day 8	Day 9	#	Day 10
50	Pausing Point 1, Day 1	# 10	Pausing Point 1, Day 2	Lesson 6: “Reptiles: Cold-Blooded and Warm-Blooded Animals”	Lesson 7: “Birds: Wings and Feathers”		Lesson 8: “Mammals: Live-Bearing Milk Producers”
20				Lesson 6B: Extensions	Lesson 7B: Extensions		Lesson 8B: Extensions; Informational Writing: Plan/Draft

Week Three										
Min.	Day 11	#	Day 12	# ⑩	Day 13	#	Day 14	⑩	Day 15	†
50	Lesson 9: “Vertebrate Animals Around the World”		Pausing Point 2, Day 1		Pausing Point 2, Day 2		Domain Assessment		Reassess/Remediate as needed; Informational Writing: Publish	
20	Lesson 9B: Extensions; Informational Writing: Draft/Revise		Informational Writing: Edit/Final Copy		Informational Writing: Publish		Domain Assessment; Informational Writing: Publish		Informational Writing: Publish	
30	Informational Writing: Draft/Revise		Informational Writing: Edit/Final Copy		Informational Writing: Publish		Informational Writing: Publish		Informational Writing: Publish	

⑩ Lessons include Student Performance Task Assessments

Lessons require advance preparation and/or additional materials; please plan ahead

† The editing and publishing steps of this informational writing piece have been placed at the beginning of Pausing Point 2. It is highly recommended that you regard this part of Pausing Point 2 as required in order to most accurately align with the writing requirements of the Common Core State Standards.

Domain Components

Along with this Anthology, you will need:

- *Tell It Again! Media Disk* or the *Tell It Again! Flip Book** for *Classification of Animals*
- *Tell It Again! Image Cards* for *Classification of Animals*

*The *Tell It Again! Posters* for *Classification of Animals* are located at the back of the *Tell It Again! Flip Book*.

You may wish to have one notebook/folder readily available for each student to be used for Classification Journals, note-taking, and/or other writing opportunities, including “domain dictionaries” and writing prompts in the comprehension questions.

You will find the Instructional Objectives and Core Vocabulary for this domain below. The lessons that include Image Cards, Posters, Instructional Masters, and Assessments are also listed in the information below.

Why Classification of Animals Is Important

This domain introduces students to the science of classification. Students will learn about five groups of vertebrates, why scientists classify animals into groups, and the characteristics by which they make these determinations. The ability to classify information is an essential skill for organizing, analyzing, and understanding data. Students will develop scientific skills as they observe and practice identifying important characteristics of organisms and objects. Additionally,

students will keep a record of what they learn in a Classification Journal. Throughout the domain, students will add to a classroom Classification Chart that will be displayed and used as a reference.

Sometimes students will be asked to engage in a structured inquiry discussion or exercise. During these activities students will be asked to respond based on their observation and thinking, rather than certain knowledge. By asking questions such as “How do you know?” and “Why do you think so?” the teacher will guide students in making reasonable statements based on what students already know and the evidence they can observe. This type of exercise helps stimulate curiosity and forms a foundation for subsequent learning.

The content students learn in this grade will serve as the basis for more in-depth study in the later grades of how living things are classified, the life cycles and reproduction of animals, oceans and marine life, and evolution.

What Students Have Already Learned in Core Knowledge Language Arts During Kindergarten, Grade 1, and Grade 2

The following domains—and the specific core content that was targeted in those domains—are particularly relevant to the read-alouds students will hear in *Classification of Animals*. This background knowledge will greatly enhance your students’ understanding of the read-alouds they are about to enjoy:

Farms (Kindergarten)

- Identify animals found on farms and the sounds they make
- Identify needs of farm animals: food, water, and space to live and grow
- Match pictures and/or names of farm animal babies to their adult parents
- Describe how farm animal babies need to be fed and cared for by their parents or people

Animals and Habitats (Grade 1)

- Describe what a habitat is
- Explain why living things live in habitats to which they are particularly suited
- Classify water habitats as either freshwater or saltwater habitats
- Identify the characteristics of the freshwater habitat

- Classify animals on the basis of the types of food they eat (herbivore, carnivore, omnivore)
- Describe ocean life as very diverse
- Explain that salt water covers most of Earth and is found in several oceans

Cycles in Nature (Grade 2)

- Explain that a cycle is a sequence of events that repeats itself again and again
- Describe animal processes in spring, summer, autumn (fall), and winter
- Define the term *life cycle*
- Identify the stages of the life cycle of a butterfly (egg to egg)
- Explain metamorphosis
- Identify the stages of the life cycle of a frog (egg to egg)
- Identify the stages of the life cycle of a chicken (egg to egg)

Insects (Grade 2)

- Explain that insects are the largest group of animals on the earth
- Describe some newborn insects as resembling the adults of their species

Core Vocabulary for Classification of Animals

The following list contains all of the core vocabulary words in *Classification of Animals* in the forms in which they appear in the text. The vocabulary words used in the Word Work activities are boldfaced. The multiple-meaning vocabulary words that are used as activities in the Pausing Points are marked with a + sign. The inclusion of the words on this list *does not* mean that students are expected to immediately be able to use all of these words on their own. However, through repeated exposure throughout the lessons, they should acquire a good understanding of most of these words and begin to use some of them in conversation.

Note: You may wish to display these vocabulary words in your classroom for students to reference throughout the domain. You may also wish to have students write these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

Lesson 1

characteristics*
classify*
invertebrates
kingdom*
organisms
taxonomy
vertebrates

Lesson 2

bask
cold-blooded*
constant*
estivate
huddle
internal
regulate
warm-blooded*

Lesson 3

cartilage
column+
crustacean
exoskeleton
nerves
slither
spine*
vertebra*

Lesson 4

aquatic*
fertilizes
gills*
lungs
respiratory
scales
spawn

Lesson 5

amphibians*
dormant
evolved
fluctuates
morph
shed
transformation
wetlands*

Lesson 6

aggressive
calcified
domed
effectively
membranes
sensitive
venomous*

Lesson 7

cavities
glide
insulation
metabolism
nest+
webbed

Lesson 8

diaphragm
infancy
mammary glands
marine
stately
terrestrial

Lesson 9

alpine
antifreeze
delta
hosts
reproduction
tentacles

*The words or variations of the words marked with an asterisk are included in the Skills Reader and Vocabulary Cards.

Comprehension Questions

In the *Tell It Again! Read-Aloud Anthology for Classification of Animals*, there are three types of comprehension questions: literal questions to assess students' recall of the core content; inferential questions to guide students to infer information from the text and think critically; and evaluative questions to guide students to build upon what they have learned from the text to use their creative, analytical, and application skills. Many of these questions are also labeled as writing prompts and are discussed in more detail in the Writing Opportunities section in this introduction.

The last comprehension question in each lesson prompts students to ask, answer, and/or research any remaining questions they may have about the content; this question may also be expanded upon as an “Above and Beyond” research and/or writing activity. Many of these comprehension questions may also serve as meaningful take-home topics to discuss with family members.

It is highly recommended that students answer all comprehension questions in complete sentences—whether orally or in writing—using domain-related vocabulary whenever possible. You may wish to have students collect written responses in a notebook or folder.

Writing Opportunities

In the *Tell It Again! Read-Aloud Anthology for Classification of Animals*, the content is reinforced through an informational piece, which students complete in Lessons 8 and 9, Pausing Point 2, and the domain genre writing time using the steps of the formal writing process: plan, draft, edit, and publish.

Everyday writing opportunities are included in the Comprehension Questions and Extensions in Lessons 1–9, as well as in both Pausing Points.

In the Comprehension Questions, shorter writing prompts that assess students' literal recall of the core content and provide practice for the short-answer writing section of the Domain Assessment are indicated by this icon: . Longer writing prompts that encourage students to think critically and expand creatively upon the content are indicated by this icon: . Some of these prompts may serve both purposes and may also be collected in a notebook or folder to provide source information for students to reference when writing their formal writing piece.

For these writing sessions, it is highly recommended that students take 5–10 minutes of Discussing the Read-Aloud time to write a half to a full page in response to one or more of the prompts, during which time you are encouraged to circulate and provide over-the-shoulder conferencing for a group of students each day. During these daily writing sessions, you may also choose to reinforce what students are learning in the Skills strand by having them practice these skills in their writing. The goal of these extended writing sessions is to provide students with daily, “low-stakes” writing practice and to have them receive immediate feedback on the content, featured skill(s), and clarity and depth of their written expression. You may also choose to publish select pieces of students’ writing—one or two sentences—to reinforce a particular concept or skill. It is highly recommended that students share their writing on a daily basis as time permits.

Student Choice and Domain-Related Trade Book Activities

In the *Tell It Again! Read-Aloud Anthology for Classification of Animals*, Student Choice and Domain-Related Trade Book activities are suggested in both Pausing Points. A list of recommended titles is included at the end of this introduction, or you may select another title of your choice.

Classification of Animals Image Cards

There are twenty-three Image Cards in the *Classification of Animals* domain. These Image Cards include key characteristics of each animal group students will learn about, including vertebrates and a review of insects (the largest group of invertebrates). In the *Tell It Again! Read-Aloud Anthology for Classification of Animals*, Image Cards are referenced in both Pausing Points and in Lessons 1,2,3,6,7, and 8.

Classification of Animals Posters

There are two Posters in the *Classification of Animals* domain, located in the back of the Flip Book. Poster 1 (Invertebrate and Vertebrate Graphic) is a graphic representation comparing the approximate known numbers of invertebrate species and vertebrate species on Earth. Poster 2 (**All My Best Friends Represent Vertebrates!**) shows a mnemonic for remembering the groups of vertebrates. The illustrated first letters of

the words are also the first letters for the following words: *amphibians, mammals, birds, fish, reptiles, and vertebrates*. In the *Tell It Again! Read-Aloud Anthology for Classification of Animals*, the Posters are referenced in both Pausing Points and in Lessons 1, 3, 4, 7, and 9.

Instructional Masters and Family Take-Home Letters

Blackline Instructional Masters and Family Take-Home Letters are included at the back of the *Tell It Again! Read-Aloud Anthology for Classification of Animals*. Instructional Masters are referenced in the Domain Assessment, in both Pausing Points, and in Lessons 1B–9B. The Family Letters are referenced in Lessons 1B and 8B.

Above and Beyond Opportunities

In the *Tell It Again! Read-Aloud Anthology for Classification of Animals*, there are numerous opportunities in the lessons and the Pausing Points to challenge students who are ready to attempt activities that are above grade-level. These activities are identified with this icon: ↗.

These opportunities may be found in the following: Comprehension Questions, Extensions, Pausing Point activities, research activities, and writing exercises.

You may also wish to assign some of these and other exercises as homework for students who are ready for a challenge outside of the classroom. Many of the comprehension questions also serve as meaningful take-home topics to discuss with family members.

Additionally, you may choose to coordinate with your school's science and/or social studies teacher(s) to further reinforce the content covered in this language arts block.

Student Performance Task Assessments

In the *Tell It Again! Read-Aloud Anthology for Classification of Animals*, there are numerous opportunities to assess students' learning. These assessment opportunities range from informal observation opportunities to more formal written assessments and are indicated by this icon: ⑩. There is also a cumulative Domain Assessment. Instructional Masters DA-1, DA-2, and DA-3 are used for this purpose. You may wish to make a copy of the Answer Keys to send home to family members. Use the

Tens Conversion Chart located in the Appendix to convert a raw score on each assessment into a Tens score. On the same page, you will also find the rubric for recording observational Tens scores.

Recommended Resources for Classification of Animals

Trade Book List

It is highly recommended that students spend a minimum of twenty minutes each night reading independently or aloud to family members, or listening as family members read to them. You may suggest that they choose titles from this trade book list. These titles may also be put into the classroom book tub for various reading levels.

1. *About Amphibians: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 2001) ISBN 1561453129
2. *About Birds: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 1997) ISBN 1561451479
3. *About Fish: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 2002) ISBN 1561453358
4. *About Mammals: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 1999) ISBN 1561451746
5. *About Reptiles: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 1999) ISBN 1561452335
6. *Amphibians*, by Melissa Stewart (Children's Press, 2001) ISBN 0516259504
7. *Amphibians: Water-to-Land Animals*, by Laura Purdie Salas (Picture Window Books, 2009) ISBN 9781404855212
8. *Animals Called Fish*, by Kristina Lundblad & Bobbie Kalman (Crabtree Publishing Company, 2005) ISBN 0778722198
9. *Animals with Backbones*, by Keith Pigdon (National Geographic Society, 2003) ISBN 0792242688
10. *The Beauty of the Beast: Poems from the Animal Kingdom*, by Jack Prelutsky (Alfred A. Knopf, Inc., 1997) ISBN 0679970584
11. *The Bird Alphabet Book*, by Jerry Pallotta (Charlesbridge, 1987) ISBN 0881064513

12. *Birds*, by Terry Jennings (QEB Publishing, Inc., 2009) ISBN 9781595667588
13. *Birds*, by Melissa Stewart (Children's Press, 2001) ISBN 0516259547
14. *Birds: Winged and Feathered Animals*, by Suzanne Slade (Picture Window Books, 2009) ISBN 9781404855229
15. *Can You Tell a Skink from a Salamander?*, by Anna Claybourne (Heinemann-Raintree, 2005) ISBN 9781410919670
16. *Classification Clues*, by Catherine Stephens (National Geographic Society, 2004) ISBN 0792245768
17. *Desert Mammals (True Books: Animals)*, by Elaine Landau (Children's Press (CT), 1997) ISBN 9780516260976
18. *Fish: Finned and Gilled Animals*, by Suzanne Slade (Picture Window Books, 2009) ISBN 9781404855236
19. *Forest Mammals*, by Bobbie Kalman (Crabtree Publishing Company 1987) ISBN 9780865051652
20. *The Frog Alphabet Book*, by Jerry Pallotta (Charlesbridge, 1990) ISBN 0881064629
21. *Fun With Nature*, by Mel Boring (Cooper Square Publishing LLC, 1998) ISBN 9781559717021
22. *The Furry Animal Alphabet Book*, by Jerry Pallotta (Charlesbridge, 1991) ISBN 0881064645
23. *Grassland Mammals (True Books: Animals)*, by Elaine Landau (Children's Press (CT), 1997) ISBN 9780516260990
24. *The Kids Guide to Zoo Animals*, by Michelle Gilders (Red Deer Press, 2004) ISBN 0889953015
25. *Kingdoms of Life: Classification (Come Learn with Me)*, by Bridget Anderson (Lickle Publishing, 2003) ISBN 9781890674175
26. *Mammals*, by Loredana Agosta and Anne McRae (McRae Books, 2008) ISBN 9788860980472
27. *Mammals: Hairy, Milk-Making Animals*, by Laura Purdie Salas (Picture Window Books, 2009) ISBN 9781404855250

28. *Many Creatures: A Song About Animal Classifications*, by Laura Purdie Salas (Picture Window Books, 2010) ISBN 9781404857636
29. *Mountain Mammals (True Books: Animals)*, by Elaine Landau Children's Press (CT), 1997) ISBN 9780516261096
30. *Outside and Inside Sharks*, by Sandra Markle (Aladdin, 1999) ISBN 9780689826832
31. *Oxford First Book of Animals*, by Barbara Taylor (Oxford Childrens, 2003) ISBN 9780199109852
32. *Peacocks, Penguins & Other Birds*, by Steve Parker (David West Children's Books, 2007) ISBN 0756518415
33. *Reptiles: Scaly-Skinned Animals*, by Laura Purdie Salas (Picture Window Books, 2009) ISBN 9781404855267
34. *Reptiles of All Kinds*, by Kelley MacAulay & Bobbie Kalman (Crabtree Publishing Company, 2005) ISBN 0778722163
35. *Small Mammals*, by Terry Jennings (QEB Publishing, Inc., 2009) ISBN 9781595667557
36. *The Snake Book*, by Mary Atkinson and Mary King Dorling (Kindersley Publishers Ltd., 1997) ISBN 9780751355659
37. *Temperate Forest Mammals (True Books: Animals)*, by Elaine Landau (Children's Press (CT), 1997) ISBN 9780516261157
38. *Tree Frogs, Mud Puppies & Other Amphibians*, by Daniel Gilpin (David West Children's Books, 2007) ISBN 0756518423
39. *Tropical Forest Mammals (True Books: Animals)*, by Elaine Landau (Children's Press(CT), 1997) ISBN 9780516261164
40. *Warm-Blooded or Cold-Blooded?*, by Bobbie Kalman (Crabtree Publishing Company, 2008) ISBN 9780778733010
41. *A Whale Is Not a Fish and Other Animal Mix-ups*, by Melvin Berger (Scholastic Inc., 1995) ISBN 0590474774
42. *What Is a Bird?*, by Bobbie Kalman (Crabtree Publishing Company, 1999) ISBN 086505892X
43. *What Is a Fish?*, by Bobbie Kalman and Allison Larin (Crabtree Publishing Company, 1999) ISBN 0865058946
44. *What Is a Mammal?*, by Bobbie Kalman (Crabtree Publishing Company, 1998) ISBN 0865058903

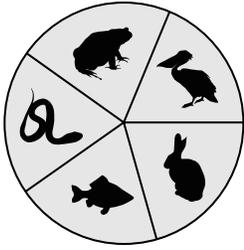
45. *What Is a Reptile?*, by Bobbie Kalman (Crabtree Publishing Company, 1999) ISBN 0865058938
46. *What is a Vertebrate?*, by Bobbie Kalman (Crabtree Publishing Company, 2007) ISBN 9780778732976
47. *What Is an Amphibian?*, by Bobbie Kalman and Jacqueline Langille (Crabtree Publishing Company, 2005) ISBN 0865059527
48. *What Is the Animal Kingdom?*, by Bobbie Kalman (Crabtree Publishing Company, 2005) ISBN 086505889X
49. *The Yucky Reptile Alphabet Book*, by Jerry Pallotta (Charlesbridge, 1989) ISBN 0881064548

Teacher/Family Resources

1. *Bill Nye the Science Guy: Mammals Classroom Edition (DVD)* (Disney Educational Productions, 2008) ISBN B001MEM7DG
2. *The Concise Animal Encyclopedia*, by David Burnie (Kingfisher, 2003) ISBN 9780753455906
3. *Eyewitness Video: Bird* (DK Publishing, 1994) ISBN 1564589145
4. *Life in Cold Blood (DVD)* (BBC Worldwide, 2008) hosted by David Attenborough ISBN 9780691137188

Websites

1. American Museum of Natural History: “OLOGY” for Kids and Families
<http://www.amnh.org/ology>
2. Animal Classification Practice
http://www.sheppardsoftware.com/content/animals/kidscorner/classification/kc_classification_main.htm
3. Discovery Kids
<http://kids.discovery.com/tell-me/animals>
4. Science Daily
<http://www.sciencedaily.com>
5. Smithsonian National Zoological Park: Animal Photo Gallery
<http://nationalzoo.si.edu/Animals/PhotoGallery>
6. Smithsonian National Zoological Park: Animal Species
<http://nationalzoo.si.edu/Animals/AnimalIndex/default.cfm>
7. Video Clips of Hundreds of Animals
<http://www.bbc.co.uk/nature/animals>



Classifying Animals by Characteristics

1

✓ Lesson Objectives

Core Content Objectives

Students will:

- ✓ Observe and describe basic characteristics of an animal
- ✓ Explain that scientists classify animals by common or shared characteristics
- ✓ Explain that scientists classify animals in order to study them and show relationships
- ✓ Identify cold-blooded/warm-blooded and vertebrate/invertebrate as important characteristics used to classify animals
- ✓ Describe basic characteristics of vertebrate/invertebrate animals
- ✓ Classify particular animals as vertebrates or invertebrates
- ✓ Identify fish, amphibians, reptiles, birds, and mammals as groups of vertebrates
- ✓ Classify particular animals as fish, amphibians, reptiles, birds or mammals
- ✓ Identify insects as invertebrates
- ✓ Identify insects as the most numerous group of animals that have currently been identified
- ✓ Explain that there are a large number of animals that have not yet been identified

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Distinguish their own point of view from that of the narrator of a read-aloud (RI.3.6)
- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Classifying Animals by Characteristics” (RI.3.7)
- ✓ Interpret information about animal characteristics and their classifications from diagrams, charts, graphs, and graphic organizers (RI.3.7)
- ✓ Compare and contrast the characteristics of a penguin and a trout, and an elephant and a telephone, and their relative classifications in “Classifying Animals by Characteristics” (RI.3.9)
- ✓ Make personal connections to the experiences of observation and classification of living and nonliving things in everyday life in “Classifying Animals by Characteristics” (W.3.8)
- ✓ Classify and organize living things and nonliving things, and the characteristics of the five groups of vertebrates (W.3.8)
- ✓ Summarize (orally and in writing) information about the characteristics and classification of an elephant (SL.3.4)
- ✓ Create word pairs of adjectives and nouns to effectively describe the characteristics of an elephant, such as *wrinkly skin* (L.3.3a)
- ✓ Listen to and understand a variety of texts, including informational texts and poems

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

characteristics, n. Features or qualities that make one group different from another

Example: JoAnn has a loud, happy laugh and is very friendly, two characteristics that make her fun to be around.

Variation(s): characteristic

classify, v. To sort or group animals or things according to shared characteristics

Example: Sean was asked to classify the songs into three different groups: classical, jazz, and blues.

Variation(s): classifies, classified, classifying

invertebrates, n. Animals that do not have a backbone

Example: Invertebrates do not have a skeleton inside of their bodies; instead, they sometimes have a hard shell-like covering on the outside of their bodies.

Variation(s): invertebrate

kingdom, n. One of the main groups into which living organisms are classified

Example: It is usually easy to tell which living things are in the plant kingdom and which are in the animal kingdom.

Variation(s): kingdoms

organisms, n. A living thing that carries out the processes of life

Example: Caroline loves to explore the stream behind her house because she finds different kinds of fascinating organisms.

Variation(s): organism

taxonomy, n. The science of grouping organisms based on shared characteristics

Example: Scientists study taxonomy so that they can better understand how animals have changed over time.

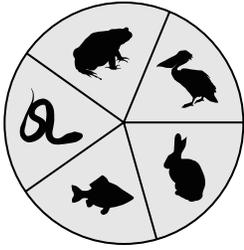
Variation(s): taxonomies

vertebrates, n. Animals that have a backbone

Example: All vertebrates have a backbone that protects their spinal cord.

Variation(s): vertebrate

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	Domain Introduction	Image Cards 1–6; Classification Chart; Instructional Master 1B-1; chart paper, chalkboard, or whiteboard [This activity requires advance preparation.]	10
	Essential Background Information or Terms		
	Classifying Living and Nonliving Things		
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Classifying Animals by Characteristics	Poster 1 (Invertebrate and Vertebrate Graphic); Image Cards 7 and 8	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	Image Cards 1–6, 9 and 10; Classification Chart; Instructional Master 1B-1 (optional); Classification Journal	15
	Word Work: Classify		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Describing Characteristics	Image Card 12; Instructional Master 1B-2 [This activity requires advance preparation.]	20
<i>Take-Home Material</i>	Family Letter	Instructional Masters 1B-3 and 1B-4	



Classifying Animals by Characteristics

1A

Introducing the Read-Aloud

10 minutes

Domain Introduction

Note: You will need to copy Instructional Master 1B-1 onto chart paper, a chalkboard, or a whiteboard in preparation for this lesson.

Display Image Cards 1–6. Ask students to describe what they see and to share what they know about any of these animals. Guide students in a discussion about these animals, letting students share what they know about where the animals might live, what they might eat, and how they live in the world.

Ask students to look at the animals in the images carefully and describe characteristics that they observe. Ask students, “How are these animals similar? How are they different?” Students may include information they have from other experiences; help them note the difference between information they may already have and observable information from the images themselves.

Explain to students that for the next few weeks, they will be learning about different types of animals and how they are grouped. Ask, “Who can tell me which group of animals is greatest in number?” (Hint: This is a particular group of animals that you may have studied in second grade. These animals have six legs. Some of them fly and some of them crawl.) Tell students that insects comprise the group of animals that is largest in number.

Show students the Classification Chart (Instructional Master 1B-1) that is displayed in the classroom. Place Image Cards 1–6 at the top of the appropriate columns on the Classification Chart in this order: insects, piranha, toad, anaconda, egret, and hippopotamus. The image cards will remain on the chart throughout the domain. Explain that the class will be filling in a part of the chart each day as they learn more from the read-alouds. Tell students that they will also be recording information that they learn in their own Classification Journals. Tell students that scientists keep journals, logs, or records—often with illustrations—of experiments, observations, and ideas.

Point to the “Insects” column in the Classification Chart, and explain that this column is already filled in because it is a very important group of animals that they may have learned about in Grade 2. You may wish to review the information already recorded in the “Insects” column at this time, or you may wish to talk about the information as it comes up in later lessons.

If students do not mention it on their own, be sure to mention that humans are scientifically classified as animals as well, although they are not the specific focus of this domain. Tell students they will learn about some of the physical characteristics humans share with other animals. You may wish to explain that humans have many nonphysical differences that make them unique and that distinguish them from other animals.

Note: Throughout the domain, reference is made to groups of vertebrates, and sometimes a group is referred to as a class. The specific taxonomy can be confusing for this grade level. Scientifically, the amphibian, reptile, bird, and mammal groups each comprise a single, different class. For example, the group of animals we call amphibians makes up the Amphibian Class. However, the group of animals we call fish is comprised primarily of three separate classes. Therefore, you will not see any reference to the Fish Class in the discussion of the five vertebrate groups, as this is technically incorrect.

Essential Background Information or Terms

Tell students that with so many animals in the world, it is helpful to put them into groups based on their characteristics. Point to the title of the Classification Chart, and explain that this process of organizing objects, ideas, or living things is called *classification* and can be shown clearly using a chart like this one. Share with students that there are all sorts of things that can be classified, not just animals. Explain that other things that can be classified include objects (desks, backpacks, boxes, etc.) and information (facts for a paragraph, information for a brainstorming web or chart, locations on a map key, etc.). Ask, “Who can tell me how we classify shapes in math?” (circle, square, rectangle, etc.) Ask, “Can you think of how musical instruments are classified?” (bass, strings, percussion, winds) Ask, “How are the ideas, or subjects, of things we learn about in school classified?” (math, language arts, social studies, science, music, art, physical education, foreign languages, etc.)

Explain that the things students just classified (math, musical instruments, school subjects) are examples of nonliving things. Tell students, however, that they will be learning in this domain about how living things, or organisms, are classified. Discuss with students the differences between nonliving and living things, such as needing oxygen to live versus not breathing at all, reproducing versus not reproducing, etc.

Explain that in order to classify all living things, scientists put them into categories called *kingdoms*. Tell students that they have heard of two of these kingdoms; they may know that animals belong to the animal kingdom and that plants belong to the plant kingdom. Students may have learned about plant and animal kingdoms in previous grades.

Classifying Living and Nonliving Things

Tell students that you are going to read a list of things—some plants, some animals, and some nonliving things. If students think what you say belongs to the plant kingdom, they should use their hands and arms to “grow leaves.” If what you say belongs to the animal kingdom, they should use their mouths to “chomp their jaws.” If what you say is nonliving, they should freeze like a nonliving object and do nothing at all. As students respond, say something like, “Yes, a lion is in the animal kingdom,” or “You’re correct! Even though water is often moving and is needed by all living things, it is nonliving.”

- lion (animal kingdom)
- oak tree (plant kingdom)
- rock (nonliving)
- turtle (animal kingdom)
- television (nonliving)
- grasshopper (animal kingdom)
- dandelion (plant kingdom)
- worm (animal kingdom)
- water (nonliving)
- rose bush (plant kingdom)

Scientists can classify the kingdom of animals into smaller groups. Explain to students that they will learn more about all kingdoms in later

grades, but that in this domain they will focus on smaller animal groups. Also, let students know that although scientists have categorized many animals into groups, they still believe there are a large number of animals that have not yet been identified and classified. When exploring dense rainforests and deep parts of the ocean, scientists continue to discover animals they have never seen before. Explain that unpopulated areas—areas where people are not living—are likely to contain many more unidentified animals as well.

Explain that when scientists organize animals into groups, they are organizing them according to particular characteristics that they have in common. By placing animals into groups, scientists can study them and see relationships between them. For example, the mammal group includes animals that give birth to live babies, whereas the bird group includes animals that lay eggs.

Purpose for Listening

Tell students that in today's read-aloud, they will hear about five groups of animals, and that they should listen carefully to find out the names of these animal groups and why scientists group them as they do.



Classifying Animals by Characteristics

← Show image 1A-1: Rattenborough, animal expert with animals and Earth

1 Rattenborough may have taught some of you about animals and habitats in Grade 1. Rattenborough will be our narrator for this domain. As you listen, think about how the information presented from the point of view of a fictional rat may differ from the point of view of another narrator, such as a different animal—fictional or real—or a human such as yourself!

Aha! I'm back. Does anyone remember me? ¹ It's me, Rattenborough, animal expert and world traveler! We've explored lots of animal habitats together, haven't we? From hot savannas to cold arctic regions, we've watched hungry carnivores eat their prey with very sharp teeth while herbivores feast on grasses nearby. Today I've got great fun in store for you! I'm going to present a slide show! But before I do that, I'd like to tell you a little about how scientists understand animals.

- 2 [Point to the animals in the image.]
- 3 [Pause for a few students to share.]
- 4 [Pause for a few students to share.]

Think about all of the different types of animals on Earth—grasshoppers, penguins, rabbits, lions, salmon, turtles, and salamanders are just a few! ² What other animals can you name? ³ Wow, you know lots of animals! How do you tell them apart? How do you recognize, or identify, them? ⁴



← Show image 1A-2: Salamander and squirrel

- 5 [Pause for a few students to share.]
- 6 [Pause for a few students to share.] (body covering, live birth/lay eggs, lungs/gills, diet, etc.)

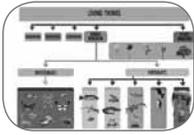
One way that we make sense of our world is by sorting things into categories, or groups. Look closely at these pictures of a salamander and a squirrel, and notice their **characteristics**. Can you name any ways that a salamander and a squirrel are alike? How are they different? ⁵ What other characteristics can you think of to help sort animals into categories? ⁶



← Show image 1A-3: Taxonomists: from Linnaeus to today

In the mid-1700s, about two hundred fifty years ago, a Swedish man named Carolus Linnaeus [la-NEE-us] became fascinated by the many different ways that people all over the world were grouping animals. Some people grouped animals by how they looked; others grouped them by their habits; and still others by where animals lived. It was all a great mumbo-jumbo, so Linnaeus decided to use their ideas to create a worldwide system to **classify**, or group, animals based on their shared characteristics. This science of classifying **organisms** is called **taxonomy**. Using new ideas and

tools, scientists have continued to study organisms and the ways they are similar and different. Over time, ideas about how to classify animals have changed somewhat.



← **Show image 1A-4: “Living Things” chart**

7 You may have learned in Grade 2 that cells are the tiny building blocks of organisms.

Scientists currently recognize three groups of living organisms based on important parts within their cells.⁷ Scientists generally agree that these groups of organisms are then divided into **kingdoms**, the main groups into which all living organisms have been further classified. Plants and animals are the two kingdoms that I know the most about, and today I’m here to talk to you about my favorite one! That’s right—the animal kingdom!

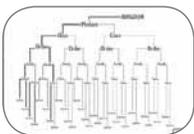
Taxonomists identify animals by their characteristics, or special features that set them apart from others. They divide the five kingdoms into smaller and smaller groups, with each smaller group having more and more in common with one another. Each group has a specific name. For example, you and I not only belong to the same kingdom—the animal kingdom—but we both belong to the same phylum [*FY-lum*]⁸—the phylum known as chordata—because we share similar body characteristics.



← **Show image 1A-5: Child’s spine**

8 [Show Image Card 7 (Rat’s Backbone). Invite students to reach back and feel their own backbones.]

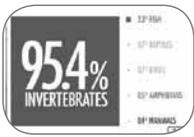
Most animals in the phylum chordata are **vertebrates**. A vertebrate has a backbone. Do you have a backbone? Yes, you do. And so do I! That is one of our common characteristics, one of the ways that scientists group us to show relationships between us.⁸ My backbone is smaller than yours, because I’m much smaller. But if you look closely at this image, you can see how similar the bones are!



← **Show image 1A-6: Taxonomy diagram**⁹

9 [Point to each section of the taxonomy diagram as you read the next six sentences.]

Vertebrates belong to the animal kingdom and are in the phylum chordata. This phylum is divided into even more groups called classes. A class is divided into smaller groups called orders. An order is divided into smaller groups called families. A family is divided into smaller groups, each called a genus. And a genus is divided into even smaller groups called species. There are many, many species within each group!



← **Show image 1A-7: Invertebrate and Vertebrate Graphic**¹⁰

- 10 What can you interpret from this graphic? [Point to the sections on the image as you read the next section.]
- 11 Who can give me an example of an animal that is an invertebrate? (Examples might be insects, spiders, crabs, ticks, clams, jellyfish, sand dollars, etc.)
- 12 [Point to the tiny squares on the right side of the image as you name each of the vertebrate groups.] The small squares next to each vertebrate group show how small each of these groups is compared with the invertebrate group.

A little more than ninety-five percent of all animals on Earth are **invertebrates**. Now that you know that a vertebrate is an animal with a backbone, what do you think an invertebrate is?¹¹ Think about it: more than ninety-five percent of all the species of animals on Earth—that’s a lot of invertebrates! And most of them are fairly small!

Fewer than five percent of all animal species are vertebrates. That means that you and I, and all vertebrates, belong to a very small percentage of all the animals on Earth! Mammals—that includes all humans—are literally just a speck!¹²



← **Show image 1A-8: Rattenborough’s scrapbook page, “Vertebrate Animals Around the World”**¹³

- 13 [As Rattenborough introduces each friend, point to the animal.]

Now that you’ve heard a little about how taxonomists sort animals into categories, I’m ready to begin the slide show of my world-wide travels, and I’m going to teach you all kinds of amazing things about animals. I met the most wonderful new animal friends while I traveled the globe, and so throughout this domain, I will show you my slides so that you can meet them, too! They represent five vertebrate groups of animals. As they are introduced, remember to think about how a scientist might classify each one of my new friends. How is each one like you and how is each one different from you?

Here’s Paolo [*POW*-lo] Piranha from Colombia. This is Tabitha Toad from Brazil. Here’s Anna Anaconda from Peru. This is Ebenezer [*eb-uh-NEE-zer*] Egret from South Africa. And meet Hilda Hippo from Tanzania. Please welcome Paolo, Tabitha, Anna, Ebenezer, and Hilda to your classroom. They are going to appear from time to time in my slides as you learn about the five vertebrate groups of animals. Be sure to keep a sharp eye out for them—you never know when one of them might turn up!

Aren't they a handsome bunch? They all belong to the animal kingdom like you and me. And, they are like us in another way: hey all have backbones.

Now, things get tricky. We are all animals and we are all vertebrates, but we are not all the same, are we? Heavens, no! We have lots of differences as well. You and I belong to the class, or group, called mammals. What makes mammals different from other classes of animals is that they have fur or hair, and the mothers give birth to live babies and feed their babies with the milk their bodies produce. You will learn more about these and other characteristics of mammals another day.¹⁴

14 Which of the animal friends in the slide is a mammal? [Pause for students to share, then point to the hippopotamus in the image.]

My friend Hilda Hippo is indeed a mammal, even though it is hard to see the little bit of hair around her mouth and on the tips of her ears and tail. When I was in Tanzania, Hilda and I had a visit with a proud new mother hippopotamus! Look at her with her baby.¹⁵

15 [Show Image Card 8 (Hippopotamus and Baby).]

So, I'm a mammal, you're a mammal, and Hilda is a mammal. But my other friends have different classifications. One of them is in the reptile class—a scaly creature that likes to warm itself in the sunshine—Anna Anaconda!¹⁶ Isn't she beautiful? She's one of the largest snakes in the world. Though she is not poisonous, her strong muscles help her constrict, or squeeze, her prey!

16 [Point to Anna Anaconda.]

Another of my friends is an amphibian, which means that she lays eggs and lives both in and out of water.¹⁷ Most animals in the amphibian class have smooth, wet skin, but my friend's skin is rather dry and leathery. Who is she? Right again—Tabitha Toad! She looks a lot like her close relative, the frog, doesn't she? Her skin helps protect her as it is camouflaged, or able to blend into the environment.¹⁸

17 [Point to Tabitha Toad.]

18 You may have learned in the *Animals and Habitats* domain in Grade 1 about how another animal, the coyote, is camouflaged in the desert because its coat is the same color as the sand, and so it is well-hidden in its habitat.

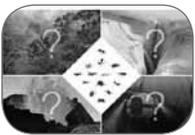
My last two friends should be easy to classify because their classification names are much more common to all of us. Which one of my friends is a member of the bird class? Yes—Ebenezer Egret! Ebenezer is a warm-blooded vertebrate with feathers.¹⁹

19 [Point to Ebenezer Egret.]

20 [Point to Paolo Piranha.]

Paolo Piranha is the last of my friends to be classified today. Which group does Paolo belong to?²⁰ Paolo Piranha is a fish. He has fins and gills, and lives in water. Piranhas, though small, are thought by many to be dangerous because of their very sharp teeth. Don't worry. Paolo, like many other piranhas, usually feeds on dead and injured wild animals.

21 [Show Poster 1 (Invertebrate and Vertebrate Graphic.)] Remember, insects make up the largest group of classified animals in the world.



Taxonomists believe that all of the vertebrate animals on Earth can be classified into one of these five animal groups—fish, amphibians, reptiles, birds, and mammals. In one of these five groups, there are three different fish classes; fish also have the largest number of species among vertebrates. Even though there are more than sixty thousand known species of vertebrates on Earth, there are nearly a million and a half invertebrates—and a million of those are insects!²¹

← **Show image 1A-9: Unexplored places on Earth**

Scientists continue to discover thousands of new insect species each year. How can this be? There are still unexplored areas of the earth—far into the rainforests, inside the cold ice of glaciers, within the hot lava of volcanoes, and deep down in the ocean. Perhaps one day *you* will discover new animals yourselves, examine and classify them by their different characteristics, and add to our understanding of taxonomy.



← **Show image 1A-10: Classification questions**

Let's think about what you've learned today. Scientists classify organisms, including animals, in order to show relationships between them. Animals are classified by common characteristics. Vertebrate animals have backbones, whereas invertebrates do not. Some are warm-blooded, whereas others are cold-blooded.

Let's think about other ways that scientists might classify animals. It is important to consider where animals live—their habitats.²² Do they live in water or on land? Do they live in warm climates or cold climates? What covers their bodies—feathers or scales, fur or hair? Do they lay eggs or do they give birth to live creatures that look like smaller versions of themselves? What

22 [Point to the deer as you read the list of questions.]

kinds of food do they eat—plants, animals, or both? These are all important questions for taxonomists to ask as they work to group animals into categories that are easily studied.

In the upcoming read-alouds, you will learn much more about how animals are classified. Next time we will pick up with the slide show so that I can teach you about the groups of animals to which Tabitha Toad, Anna Anaconda, and Paolo Piranha belong. Can anyone make a prediction about which of my friends are warm-blooded animals like me? Well, you'll have to wait until next time to see if you are right!

Discussing the Read-Aloud

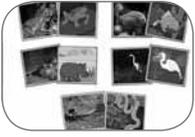
20 minutes

Comprehension Questions

15 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** For written responses in this domain, students will use their Classification Journals to collect source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

1. *Literal* Who is the narrator of this domain? (Rattenborough the rat)
2. *Literal* [Point to Image Cards 1–5 (Piranha, Toad, Anaconda, Egret, Hippopotamus) at the top of the Classification Chart.] What are the five groups of animals that are classified as vertebrates? (amphibians, mammals, birds, fish, and reptiles) [Fill in the headings of each column on the Classification Chart as students answer this question.]
 You may also wish to have some students fill out Instructional Master 1B-1 independently.
3. *Literal* What is the main characteristic that these five groups share, or have in common? (a backbone)



← **Show image 1A-8: Vertebrate Animals from Around the World**

4. *Inferential* [Point to each animal and ask the following.] What is this animal's name, and to which vertebrate group does it belong? (Paolo Piranha–fish; Tabitha Toad–amphibians; Anna Anaconda–reptiles; Ebenezer Egret–birds; Hilda Hippo–mammals)
5. *Evaluative* You heard background information about a scientist named Carolus Linnaeus, who first developed the classification system we still use today. Why was taxonomy important to Linnaeus, and why is it still important to modern scientists today? (to help classify organisms and recognize similarities and differences in their characteristics; to identify them; to better understand new animals; etc.)
6. *Evaluative* What are the two kingdoms, or large groups of organisms, that you heard about today? (animal and plant) Which kingdom is Rattenborough's favorite? (animal) Why do you think Rattenborough might especially enjoy members of the animal kingdom? (Answers may vary.)
7. *Inferential* What are two important ways that scientists classify animals? (cold-blooded/warm-blooded, and vertebrate/invertebrate) What are some of the other characteristics scientists may use? (body covering, live birth/lay eggs, lungs/gills, diet, etc.)
8. *Literal* What are animals without a backbone called? (invertebrates) Which invertebrate group contains the most number of species in the world? (insects)
9.  *Evaluative* Why do you think scientists have made, and will continue to make, changes to the classification system over time? (New species of organisms have been and will be discovered; new observations have been made about organisms; advances in technology have expanded our level of understanding; we are always learning new things about ourselves and our world; etc.)

10.  *Evaluative* [Point to Image Cards 1–5 (Piranha, Toad, Egret, Anaconda, Hippopotamus) displayed at the top of the Classification Chart.] Observe the animals in each image, and describe some of the characteristics. For example, in looking at the photograph of the red-bellied piranha, you might notice that its sides are covered with grayish-black spots; it has a wide tail with pointed tips; and its teeth are large and sharp. (Answers may vary.) [This is to practice the skills of observation and the description of *any* observable characteristics; in this introductory lesson, students are not necessarily expected to know or recognize all of the characteristics that distinguish a particular class or group of animals.]

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

11.  *Evaluative Think Pair Share:* [Show Image Card 9 (Penguin) and Image Card 10 (Trout).] Observe the animals' characteristics carefully. How would you compare and contrast them? In other words, what similarities do you notice between a penguin and a trout? What differences do you see? If you were a taxonomist, how would you classify these animals? Why? (Answers may vary.)
12. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Classify

5 minutes

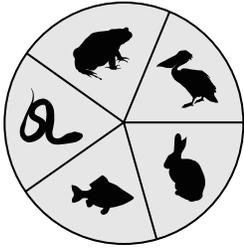
1. In the read-aloud you heard, “. . . [the scientist] Linnaeus decided to use [people’s] ideas to create a worldwide system to *classify*, or group, animals based on their shared characteristics.”
2. Say the word *classify* with me.
3. The word *classify* means to sort or group animals or things according to common characteristics.
4. In order to organize, study, and compare animals, scientists classify them by their common or shared characteristics.
5. Have you ever had to classify something? What was it? If not, can you imagine something that you might have to classify this school year? Be sure to use the word *classify* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I have had to classify . . .”]
6. What’s the word we’ve been talking about? What part of speech is the word *classify*?

Use a *Making Choices* activity for follow-up. Directions: I will name a person. I want you to think about what types of things this person may classify in his or her job. For example, if I say, “teacher,” you might say, “The teacher may classify her students into groups of boys and girls.” Be sure to use the word *classify* in a complete sentence when you share. (Answers may vary for all examples.)

1. a grocery store worker (A grocery store worker may classify the food in the grocery store.)
2. a librarian/media specialist (The librarian/media specialist may classify the books, magazines, and videos in the library.)
3. an astronomer (An astronomer may classify the stars, planets, comets, and galaxies in the universe.)
4. a musician (A musician may classify sheet music, instruments, and composers.)
5. a mail carrier (A mail carrier may classify zip codes, letters, and packages.)



Complete Remainder of the Lesson Later in the Day



Classifying Animals by Characteristics

1B

Extensions

20 minutes

Describing Characteristics (Instructional Master 1B-2)

Copy Instructional Master 1B-2 onto chart paper, a chalkboard, or a whiteboard to record students' ideas. Tell students that in order for scientists to understand and classify animals, they need to be skilled in observing and describing animals' characteristics. During this domain, students will have many opportunities to observe photos of animals and practice identifying and describing their characteristics.

Show students Image Card 12 (Elephant). Do a verbal warm-up to help students start thinking about the characteristics of the elephant.

- Raise your hand if you would describe the elephant as having a large size.
- Raise your hand if you would describe the elephant as having a lot of fur.
- Raise your hand if you think the elephant has a backbone.
- Raise your hand if you think the elephant lives in a cold climate.
- Raise your hand if you think the elephant lays eggs.
- Raise your hand if you have ever seen an elephant at a zoo, in the wild, in a book, or on television.

Explain to students that together you will create a web of word pairs that describe the characteristics of the elephant. For example, you might use "wrinkly skin." *Wrinkly* is an adjective that describes the skin of the elephant.

In addition to listing general characteristics, guide students in understanding that the elephant is a vertebrate because it has a backbone, is warm-blooded, and is a mammal that gives birth to live babies. Tell students that they will learn more about these characteristics throughout the domain.

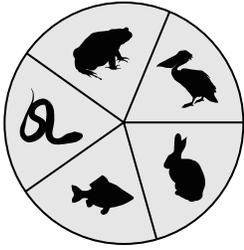
 **Note:** You may wish to have some students complete Instructional Master 1B-2 independently to record these ideas and additional

information and ideas. Students may create a drawing of the elephant in the central oval. Have students save these in their Classification Journals.

Take-Home Material

Family Letter

Send home Instructional Masters 1B-3 and 1B-4.



Cold-Blooded and Warm-Blooded Animals

2

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✔ Observe and describe basic characteristics of an animal
- ✔ Explain that scientists classify animals by common or shared characteristics
- ✔ Explain that scientists classify animals in order to study them and show relationships
- ✔ Identify cold-blooded/warm-blooded and vertebrate/invertebrate as important characteristics used to classify animals
- ✔ Describe basic characteristics of cold-blooded and warm-blooded animals
- ✔ Classify particular animals as cold-blooded or warm-blooded
- ✔ Identify fish, amphibians, reptiles, birds, and mammals as groups of vertebrates
- ✔ Identify basic characteristics of fish, amphibians, reptiles, birds, and mammals
- ✔ Identify insects as invertebrates
- ✔ Identify insects as the most numerous group of animals that have currently been identified
- ✔ Demonstrate familiarity with the poem “The Crocodile”

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Cold-Blooded and Warm-Blooded Animals” (RI.3.7)
- ✓ Interpret information about animal characteristics and their classifications from diagrams, charts, graphs, graphic organizers, and maps (RI.3.7)
- ✓ Compare and contrast the behaviors of hibernation and estivation in “Cold-Blooded and Warm-Blooded Animals” (RI.3.9)
- ✓ Make personal connections to the content by discussing whether humans are cold-blooded or warm-blooded and how they help keep their own bodies cool and warm in “Cold-Blooded and Warm-Blooded Animals” (W.3.8)
- ✓ Classify and organize the characteristics of five groups of vertebrates (W.3.8)
- ✓ Make predictions about whether Hilda Hippo has a backbone prior to “Cold-Blooded and Warm-Blooded Animals” based on the title, images, and text heard thus far, and then compare the actual outcomes to predictions, and follow up on their former predictions about which of Rattenborough’s friends are warm-blooded (SL.3.1a)
- ✓ Summarize (orally and in writing) information about the characteristics and classification of a crocodile (SL.3.4)
- ✓ Create word pairs of adjectives and nouns to effectively describe the characteristics of a crocodile, such as *sharp teeth* (L.3.3a)
- ✓ Use a known root word as a clue to the meaning of an unknown word with the same root, such as *hippopotamus* and *hippopotami* (L.3.4c)
- ✓ Listen to and understand a variety of texts, including informational texts and poems
- ✓ Draw illustrations to represent the characteristics of a crocodile from “Cold-Blooded and Warm-Blooded Animals”

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

bask, v. To warm the body by lying in the sun or a comfortably warm place

Example: My pet gecko sits on the windowsill to bask in the sunlight shining through the window.

Variation(s): basks, basked, basking

cold-blooded, adj. Having a body temperature that changes with the temperature of the environment

Example: Because river turtles are cold-blooded animals, sitting on a log in the sun is one way they can warm themselves.

Variation(s): none

constant, adj. Not changing very much and staying steady and even

Example: Because my pet snake’s temperature doesn’t stay constant on its own, his cage has a heat lamp to keep him warm in cold weather.

Variation(s): none

estivate, v. To become inactive during the summer in order to avoid too much heat or getting too dried out

Example: During the hot summer months, lizards estivate to escape the heat by resting in cool underground homes.

Variation(s): estivates, estivated, estivating

huddle, v. To crowd or squeeze together in a group to stay warm

Example: On a cold winter’s night, the foxes huddle together for warmth inside their burrow.

Variation(s): huddles, huddled, huddling

internal, adj. On the inside or center of an object or organism

Example: A person’s internal temperature is usually warmer than his or her surroundings.

Variation(s): none

regulate, v. To control or adjust something to keep it working properly

Example: It’s important to have laws that regulate the safety of cars and other vehicles.

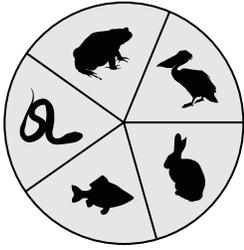
Variation(s): regulates, regulated, regulating

warm-blooded, adj. Being able to control internal body temperature by making heat within the body and having ways to cool the body down when needed

Example: The warm-blooded dog pants to cool down and has a fur coat to help it stay warm when it is cold outside.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	Classification Chart	10
	What Do We Know?	Image Cards 1–5; Classification Chart	
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Cold-Blooded and Warm-Blooded Animals	world map or globe; thermometer (optional)	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	Image Card 8; Classification Chart; Instructional Master 1B-1 (optional)	15
	Word Work: Constant		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Poetry Reading	Image Card 13; world map or globe	20
	Describing Characteristics	Image Card 13; Instructional Master 2B-1; drawing tools	



Cold-Blooded and Warm-Blooded Animals

2_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Remind students that in the previous lesson they learned that scientists classify animals, and that the name for this branch of science is taxonomy. Remind students also that classifying means grouping things together based on how they are alike and separating them by how they are different. Taxonomists classify animals based on their characteristics. Review with students that the reason we classify animals is so that we can learn more about them.

Remind students that in the previous read-aloud Rattenborough introduced them to his five friends. Ask for volunteers to name them. (Tabitha Toad, Hilda Hippo, Ebenezer Egret, Paolo Piranha, Anna Anaconda) Ask students if they have noticed anything about the letters in the names of the animals. Share with students that the names of Rattenborough's friends all use a literary device called alliteration in which the friend's first name and last name begin with the same letter sound except for Ebenezer Egret. Repeat the names with the students so that they can hear the alliteration.

Point to the Classification Chart, and ask students to name the five vertebrate groups of animals to which Rattenborough's five friends belong. Review the following groups: amphibians, mammals, birds, fish, and reptiles. Ask for students to name the invertebrate group which has the greatest number of species that have been identified by taxonomists. Remind students that the insect group has the greatest number of species on Earth. Also remind students that there are many other animals that belong to other invertebrate groups that they will learn more about in the future.

What Do We Know?

Tell students that you will read a series of statements about the five vertebrate animals that are shown on the top of the Classification Chart. Ask students to observe the images closely as you read and to think about what they can see. They should also think about what they learned

in the previous read-aloud. If the statement you read is true, tell students they should *tap the top* of their head. If the statement you read is false, tell students they should put a *finger on their face*.

- The egret and the toad each have four legs. (*finger on face*)
- The hippopotamus is an invertebrate. (*finger on face*)
- The anaconda has a much longer backbone than the piranha. (*tap the top*)
- All five groups of animals are in the animal kingdom. (*tap the top*)
- The egret is covered in fur. (*finger on face*)
- The hippopotamus has its eyes, ears, and nostrils on the top of its head. (*tap the top*)
- The anaconda, the toad, and the piranha all live in the Amazon rainforest of South America. (*tap the top*)

Purpose for Listening

Tell students that they will be learning more about an important characteristic taxonomists use to classify animals—whether an animal is cold-blooded or warm-blooded. Ask students to predict what it means for an animal to be cold-blooded or warm-blooded. Tell students to listen carefully to see if their predictions are correct.



Cold-Blooded and Warm-Blooded Animals

- ← Show image 2A-1: Rattenborough’s scrapbook page, “Vertebrate Animals Around the World”

Hi, boys and girls. I have brought along my slide show once again. Today we’re going to look at slides of my friends, some of whom are **cold-blooded** animals and some of whom are **warm-blooded** animals. By the sound of it, you would think that warm-blooded animals have warm blood and cold-blooded animals have cold blood, but in fact this is not the case. The body temperature of a cold-blooded animal changes according to the surroundings, or environment of that animal, whereas a warm-blooded animal maintains about the same temperature all of the time. I heard that you are keeping a chart to sort, or classify, animals into groups. What a great idea! You are practicing taxonomy, the study of classifying organisms, exactly like taxonomists do!¹

- 1 Why do taxonomists classify organisms? (to study them and show relationships)

You’re going to be learning how to sort animals in lots of different ways. Today we are going to sort these five vertebrate groups into two smaller groups. By discovering some common characteristics, you’ll learn how to tell which animals are cold-blooded and which animals are warm-blooded. Now I’d like to help you understand a little more about cold-blooded animals.

- ← Show image 2A-2: Paolo and piranhas



Paolo Piranha lives in the country of Colombia on the continent of South America.² He’s a fish. His body temperature, the measure of how warm his body is on the inside, changes with his surroundings. Right now, his temperature is the same as the water in which he is swimming. When *you* go swimming, chances are the water is colder than your body temperature.³ I suppose it may depend on the day, but my guess is that the water is usually a bit cooler than you! Paolo does not ever feel cold in water, because there is no difference between his temperature and the water temperature where he lives.

- 2 [Have a volunteer point to Colombia and South America on a world map or globe.]

- 3 Does the water feel cold or hot when you jump into a pool or river? [Pause for students to share.]



← **Show image 2A-3: Taking child's temperature**

4 [You may wish to show students a thermometer.]

Have any of you ever used a thermometer?⁴ Perhaps when you are sick, your parents or a nurse might measure your temperature with a thermometer. When warm-blooded people get ill, their temperatures often rise, or go up. A person's normal body temperature is about 98.6 degrees Fahrenheit, and it remains **constant**, or about the same, most of the time. That's very different from Paolo! The way in which an animal's body temperature is controlled determines whether it is a cold-blooded or warm-blooded animal.

My friend Paolo told me that his **internal**, or inside, body temperature is never constant. It does not stay the same. He cannot heat his body from the inside like you, so his temperature must change with his surroundings in order for his body to work properly. He becomes hot when it is hot around him and cold when it is cold around him.

So, you see, although you and Paolo are both vertebrates, you also have differences. One of you is cold-blooded and one of you is warm-blooded.⁵ You're right! You are warm-blooded. So that makes Paolo . . .⁶ Yes! Cold-blooded! Most fish are cold-blooded. In fact, most animals on Earth are cold-blooded. Two of my other friends are cold-blooded as well. Does anyone know who else among them is cold-blooded?⁷ Great answers! Next, I'd like to tell you a little about Anna Anaconda.

5 Are you cold-blooded or warm-blooded? [Pause for students to share.]

6 [Pause for students to share.]

7 [Pause for students to share.]
(Anna Anaconda and Tabitha Toad)



← **Show image 2A-4: Anna and anaconda**

8 [Have a volunteer point to Peru on a world map or globe.]

Like Paolo, Anna lives in the rainforest of South America, too, in the country of Peru.⁸ In fact, she shares Paolo's river home, but she is not a fish. She can swim, but she lives on land and is not dependent upon the water to stay alive. Does anyone remember what group of animals Anna belongs to?⁹ That's right! Anna Anaconda is classified as a reptile, and she shares some of Paolo's characteristics. They're both cold-blooded, but that doesn't mean that they don't enjoy being warm. Anna loves the heat! Her body is very long indeed, and she told me that one of her favorite things to

9 [Pause for students to share.]

do is **bask** in the sun. The sun helps her stay warm, and her body soaks up the heat from the warm ground as well. Because she cannot control her own body temperature, Anna depends upon the sun and her warm surroundings to keep properly warm. In fact, my other cold-blooded friend, Tabitha Toad, likes the sun, too!



← **Show image 2A-5: Tabitha and toad**

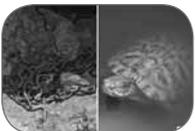
Frogs and toads share some of the same characteristics as fish and reptiles. They use their surroundings to maintain—or keep constant—the proper body temperature. Yes indeed, Tabitha Toad is cold-blooded, just like Paolo and Anna.

And, like Paolo and Anna, Tabitha is very comfortable around water. She comes from the Amazon rainforest in the country of Brazil.¹⁰ But just because her home is near the largest river in the world, it doesn't mean she lives in water all the time. Tabitha and all toads are actually more comfortable on land, whereas frogs prefer to be wet. Tabitha is an amphibian, which means that she can live both in and out of the water.

So, there you have it—fish, reptile, amphibian—three groups of cold-blooded creatures. Their body temperatures change depending upon where they are, becoming warm when their surroundings are warm and cold when it's cold around them. Because they do not have constant body temperatures, they can easily become too hot or too cold. They have developed characteristics and behaviors so that they can live in certain habitats.¹¹

10 [Have a volunteer point to Brazil and the Amazon River on a world map or globe.]

11 You may have learned about habitats in Grade 1. Who can describe what I mean when I say the word *habitats*? (specific homes of living things)



← **Show image 2A-6: Snakes huddling and turtle preparing for hibernation**

My three friends do not live in very cold climates, but some cold-blooded animals do. In order to stay warm in colder climates, some snakes **huddle**, or crowd together, hibernating underground during the winter months. Some turtles dig down deep into the warm mud and hibernate at the bottom of streams and ponds to stay warm when it is cold outside. I'm thinking that this turtle is searching for just the right spot in which to hibernate along this

muddy bottom. In winter, there is less food for animals to forage or search for, so it is a good time for them to hibernate, or become inactive, and live off the stored energy in their bodies. Cold-blooded animals that live in very hot climates must do something like hibernate, too. Instead of hibernation, which describes the process of keeping warm-blooded *and* cold-blooded animals from freezing when it is cold outside, the term *estivation* is used to describe the process of keeping only cold-blooded animals from overheating when it is very hot outside, or losing too much moisture during very dry periods. For example, crocodiles **estivate**, or become inactive, when it is hot. They stay in water or mud to cool off and escape the heat of the very hot climates where many of them live. Some snails estivate to stay moist during parts of the summer dry season.

So, everybody, let's see what you have learned from seeing our cold-blooded friends—Paolo, Anna, and Tabitha. If the temperature outside is forty-five degrees Fahrenheit, what are their body temperatures going to be?¹² Right—forty-five degrees! Cold-blooded animals do not have a constant internal body temperature; it changes with their surroundings.

Warm-blooded animals like you and me are much different. If the outside temperature is forty-five degrees Fahrenheit, what is your internal temperature going to be? About 98.6 degrees Fahrenheit! Because our bodies **regulate** our internal body temperatures, and keep them constant, we are able to live in both very hot and very cold habitats.

← **Show image 2A-7: Child warming up and cooling off**

Most of the time, warm-blooded animals don't even have to think about regulating their body temperatures. They use the food they eat to produce heat inside their bodies. Sometimes, however—in especially cold or hot temperatures—they need to do a little extra something to help regulate their temperature. What do you do to help your body stay warm when it is very cold outside?¹³ Yes, you may put on extra layers of clothing, move around, sit by the fire, or drink some hot chocolate.

12 [Pause for students to share.]



13 [Pause for a few students to share.]

14 [Pause for a few students to share.]

Who can tell me what you do to cool off on a hot day? ¹⁴ Yes, you may take off some extra clothing, lie still, go for a swim, or have a cool drink. Dogs pant and humans sweat to cool off as well. Like people, other animals seek out the shade of trees to cool themselves. Some animals, like the elephant, can fan themselves with their large ears. The large thin ears of some animals are good places for the heat to escape, which cools their bodies even more!

15 Were your predictions correct about which friend is warm-blooded? [Have a volunteer point to South Africa and Tanzania on a world map or globe as you read the following sentence.]

Let's learn a little about two of my other friends, my warm-blooded friends—a bird, Ebenezer Egret; and a fellow mammal, Hilda Hippo. ¹⁵ They both live on the continent of Africa—Ebenezer in the country of South Africa; and Hilda in the east African country of Tanzania. Mammals and birds produce their own body heat internally, which keeps their body temperatures constant. We are going to see some ways these warm-blooded animals help their bodies hold onto their warmth when it's cold outside and keep cool when it's very hot outside. For instance, a body characteristic of a whale is that it has blubber, which gives it extra help in staying warm. This allows a whale to have a wider range of habitats because it can swim in colder waters.



← **Show image 2A-8: Ebenezer and egret**

One thing's for sure: Ebenezer Egret does not put on a winter coat like you do when it's cold outside! Of course, he doesn't need to put on an extra coat because he already has a brilliant coat of feathers! Feathers help keep Ebenezer warm. Want to know an interesting fact that Ebenezer shared with me while I was visiting South Africa? Egrets' beautiful white feathers were once prized by hat-makers who used them for the sake of women's hat fashion and beauty—not warmth. Imagine that!



← **Show image 2A-9: Birds migrating**

Birds that live in cold climates sometimes travel south for the winter to make it easier to stay warm and find more available food. Migration is a behavior, or something an animal does, to help it stay warm.

Often, physical characteristics help an animal stay warm. Ebenezer wears a coat of feathers, and I wear a coat of fur. Are you wondering what Hilda Hippo uses for a little additional warmth because she doesn't have fur? Let's take a look and see!



← **Show image 2A-10: Hilda and hippopotamus**¹⁶

16 [Point to the image.] Do you think this hippopotamus is trying to stay warm?

I have a bit of news for you—in the hot tropical climates of Africa where Hilda Hippo lives, trying to stay cool is a more common occurrence than trying to stay warm. Hilda's body design is perfect for helping her stay cool! She has a nice layer of blubber that insulates her and helps her float. Hippopotami spend lots of time in the water of lakes and rivers to escape the heat.¹⁷ Can you see any other characteristics of the hippopotamus that help it stay in the water for long periods of time?¹⁸ Good observations! Notice how having its nostrils, eyes, and ears on the top of its head lets the hippopotamus keep most of its body underwater where it can stay cool!

17 The plural of *hippopotamus* is *hippopotamuses*. *Hippopotami* is also an acceptable plural form, similar to the plural forms of *octopus*, which are *octopuses* or *octopi*.

18 [Pause for a few students to share.]

Ebenezer also uses water to stay cool. Even though egrets can't swim, they do spend lots of time wading in the water, mostly to get their dinner! They feast on fish and toads and plenty of insects in order to store up the energy needed to control their body temperatures.

Well, everybody, our time is up for today. You have learned a lot about the taxonomy of cold-blooded and warm-blooded animals, so now you can fill in our Classification Chart. Next time we meet, we'll continue with our slide show and sorting our animal friends into groups, those with backbones and those without. Do you think Hilda Hippo has a backbone? How about if you mull this over until next time and be ready to share your predictions. I can't wait to see all of you again and continue with the show! Bye for now!

Comprehension Questions

15 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** For written responses in this domain, students will use their Classification Journals to collect source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

1.  *Inferential* What do we mean when we say an animal is cold-blooded? (Its body temperature changes with its surroundings and is not regulated internally; it is not constant.) Describe how cold-blooded animals warm their bodies. (They bask in the sun; they seek out warm places; they hibernate.) Describe how they cool their bodies. (They estivate, or they seek shade, water, mud, or other places with cooler temperatures.)
2.  *Inferential* What do we mean when we say an animal is warm-blooded? (It regulates its body temperature internally to keep a constant internal temperature all the time.) Describe some ways that warm-blooded animals help their bodies stay warm when it is especially cold outside. (They eat food, hibernate, have feathers or fur, migrate, and huddle together.) Describe some things that a warm-blooded animal does to help its body cool off when the outside temperatures are especially hot. (sweat, pant, drink water, go in cool water)
3. *Literal* What groups of animals did you hear about that are cold-blooded? (fish, amphibians, reptiles) What groups of animals did you hear about that are warm-blooded? (birds, mammals) [Write “warm-blooded” or “cold-blooded” for each animal group in the Classification Chart as students answer questions 1 and 2. Point out that insects, which make up the largest invertebrate group, are marked as cold-blooded on the Classification Chart because they are classified as cold-blooded animals.]

 You may also wish to have some students fill out Instructional Master 1B-1 independently.

4. *Literal* Warm-blooded animals such as dogs and whales don't have clothes to wear like humans do. What kinds of coverings do warm-blooded animals have to help keep the warmth in their bodies? (fur coats, thick feathers, blubber)
5. *Inferential* You have heard that some animals hibernate during winter to stay warm. What are some other reasons animals hibernate? (to save energy; so they don't have to eat as much because there is not as much food in the winter)
6.  *Evaluative* In the read-aloud today, you learned that some cold-blooded animals estivate when it is hot in order to survive. Give an example of a cold-blooded animal and what it might do to estivate. (A turtle or frog may dig down into the mud, become inactive, and stay on the bottom of a pond.)
7. *Evaluative* How are hibernation and estivation similar? (During both, animals become inactive; both processes help protect from extreme weather conditions.) How are they different? (Animals hibernate when they are cold and estivate when they are hot and/or dry; warm-blooded and cold-blooded animals hibernate; only cold-blooded animals estivate.)
8.  *Inferential* Describe the behavior and characteristics that help a hippopotamus keep from getting too warm. (spending time in water; nostrils, eyes, and ears on top of head; etc.) [Show Image Card 8 (Hippopotamus and Baby) to prompt student observation and responses.] Who can tell me how to form the plural of the word hippopotamus? (hippopotami or hippopotamuses)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

9.  *Evaluative* *Think Pair Share:* You learned that humans are warm-blooded animals. Why is it that humans as warm-blooded animals can live in many different environments? (Warm-blooded animals regulate their body temperature internally; energy from food helps warm them; they add or remove layers of clothing; they heat or cool their homes; etc.)
10. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?

- ✈ You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Constant

5 minutes

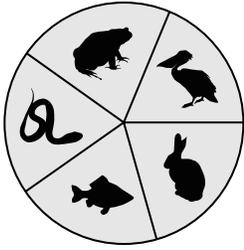
1. In the read-aloud you heard, “A person’s normal body temperature is about 98.6 degrees Fahrenheit and it remains *constant*...”
2. Say the word *constant* with me.
3. Something that is constant does not change very much; it stays steady and even.
4. Miguel’s grandfather is a constant support to him when he needs help with his math homework.
5. Have you ever noticed something or someone in your life that is constant, or that stays steady? What or who is it? Be sure to use the word *constant* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “The thing in my life that stays constant is . . .”]
6. What’s the word we’ve been talking about? What part of speech is the word *constant*?

Use a *Making Choices* activity for follow-up. Directions: I am going to name a situation. If what I name is an example of something that is steady and constant, say, “That is constant.” If what I name is an example of something that changes a lot and is not constant, say, “That is not constant.”

1. On some days, Janine is friendly to me and on other days she doesn’t talk to me. (That is not constant.)
2. My aunt is always willing to talk when I have a problem to solve. (That is constant.)
3. My pet snake’s temperature goes up and down depending on whether she is lying under the heat lamp or not. (That is not constant.)
4. Eating a good breakfast every day helps me think clearly at school. (That is constant.)
5. Sam’s internal body temperature stays about the same whether it is a cold, blustery winter night, or a hot, muggy summer afternoon. (That is constant.)



Complete Remainder of the Lesson Later in the Day



Cold-Blooded and Warm-Blooded Animals

2_B

Extensions

20 minutes

Poetry Reading

Tell students that they are going to hear a poem titled “The Crocodile” written by Lewis Carroll. Tell students that Lewis Carroll is also the author of the fantasy stories *Alice’s Adventures in Wonderland* (a few excerpts of which are in their Skills reader) and *Through the Looking Glass*. Tell students to listen for the characteristics of the crocodile that Lewis Carroll includes in his poem.

The Crocodile
by Lewis Carroll

How doth the little crocodile

Improve his shining tail,

And pour the waters of the Nile

On every golden scale!

How cheerfully he seems to grin!

How neatly spreads his claws,

And welcomes little fishes in

With gently smiling jaws!

After reading the poem, ask students to share a characteristic about the crocodile that they heard in the poem. Ask them to remember the describing words, or adjectives, that Lewis Carroll uses to create an image of the crocodile in its habitat. You may wish to show students a world map or globe, and ask a student to point to the habitat of the crocodile in this poem—the Nile River in Egypt. [If you have taught the *Early World Civilizations* domain, students may be familiar with the importance of the Nile and its flooding waters.]

Show students Image Card 13 (Crocodile). Explain that this is not the same species of crocodile as the one that would be found in the Nile River. The crocodile shown in the image is an Australian saltwater crocodile. Reread the poem and ask students to think about and listen for more characteristics and describing words.

- ✈ As time permits, you may wish to have some students create a drawing of this poem and caption it. Have them share their drawings and captions. Students may save their drawings in their Classification Journals.

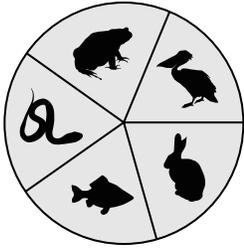
Describing Characteristics (Instructional Master 2B-1)

Remind students that in order for scientists to understand and classify animals, they need to be skilled in observing and describing animals' characteristics. Show students Image Card 13 (Crocodile). Explain to students that they will use Instructional Master 2B-1 to create a web of word pairs like you did together in Lesson 1 that describe the characteristics of the crocodile. For example, they might use "sharp teeth." *Sharp* is an adjective that describes the teeth of the crocodile.

Ask students to create a drawing of the crocodile in the central oval and/or on the back of their worksheet.

In addition to listing general characteristics, guide students in understanding that a crocodile is a vertebrate because it has a backbone, is cold-blooded, has scales, and lays eggs. Tell students that they will learn more about these characteristics throughout the domain.

Give students the opportunity to share some of their word pairs. Students will save their webs in their Classification Journals. Remind students that scientists keep journals, logs, or records—often with illustrations—of experiments, observations, ideas, and descriptions.



Vertebrate Animals

3

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✔ Observe and describe basic characteristics of an animal
- ✔ Explain that scientists classify animals by common or shared characteristics
- ✔ Explain that scientists classify animals in order to study them and show relationships
- ✔ Identify cold-blooded/warm-blooded and vertebrate/invertebrate as important characteristics used to classify animals
- ✔ Describe basic characteristics of vertebrate and invertebrate animals
- ✔ Classify particular animals as vertebrates or invertebrates
- ✔ Describe basic characteristics of cold-blooded and warm-blooded animals
- ✔ Classify particular animals as cold-blooded or warm-blooded
- ✔ Identify fish, amphibians, reptiles, birds, and mammals as groups of vertebrates
- ✔ Identify basic characteristics of fish, amphibians, reptiles, birds, and mammals
- ✔ Classify particular animals as fish, amphibians, reptiles, birds, or mammals
- ✔ Identify insects as invertebrates
- ✔ Identify insects as the most numerous group of animals that have currently been identified
- ✔ Explain that there are a large number of animals that have not yet been identified

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Vertebrate Animals” (RI.3.7)
- ✓ Interpret information about animal characteristics and their classifications from diagrams, charts, graphs, and graphic organizers (RI.3.7)
- ✓ Compare and contrast the characteristics of a grasshopper and of other animals in “Vertebrate Animals” (RI.3.9)
- ✓ Make personal connections to the experience of being a vertebrate and how having a backbone/skeleton affects behavior in “Vertebrate Animals” (W.3.8)
- ✓ Classify and organize the characteristics of five groups of vertebrates (W.3.8)
- ✓ Make predictions about whether all animals on Earth have backbones during “Vertebrate Animals” based on the title, images, and text heard thus far, and then compare the actual outcomes to predictions, and follow up on their former predictions about whether Hilda Hippo has a backbone (SL.3.1a)
- ✓ Summarize information orally about the characteristics of various animals as acted out by classmates (SL.3.4)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

cartilage, n. Strong, flexible tissue, most of which grows into hard bone in many vertebrates

Example: Stephanie can bend her outer ear because human ears are made of cartilage, not hard bone.

Variation(s): none

column, n. A set of objects arranged in a vertical, or up and down, arrangement; a supporting base

Example: When Ian looked closely at the stone column, he could see the individual stones stacked on top of each other.

Variation(s): columns

crustacean, n. A group of mostly aquatic invertebrates that have a tough outer skeleton; two or three body sections; and include lobster, crayfish, crabs, sow bugs, and shrimp

Example: The restaurant menu always includes at least one crustacean—either lobster, shrimp, or crab—for seafood lovers.

Variation(s): crustaceans

exoskeleton, n. The tough, rigid, outer covering that invertebrate animals have for protection and to keep from drying out

Example: Carmen examined the shiny black exoskeleton of the stag beetle.

Variation(s): exoskeletons

nerves, n. Parts of the body that send messages to and from the brain through the spinal cord

Example: When he touched the stove, the sensitive nerves in Charlie’s fingertips quickly gave him the message that it was hot.

Variation(s): nerve

slither, v. To slide smoothly along, often with a slight zigzag pattern

Example: Ben watched with fascination as the snake used the muscles all along its long spine to slither across the ground.

Variation(s): slithers, slithered, slithering

spine, n. A backbone

Example: When I run my hand along my dog Mosa’s backbone, I can feel every single bone of her spine.

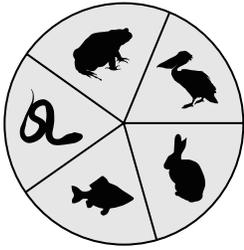
Variation(s): spines

vertebra, n. Each of the bones that make up the spinal column or backbone of a vertebrate animal

Example: On the skeletal model of the snake, Simon carefully put each of the vertebra in place so that we could easily picture the way a snake's backbone fits together.

Variation(s): vertebrae

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	Classification Chart	10
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Vertebrate Animals	Poster 1 (Invertebrate and Vertebrate Graphic) Image Card 14	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	Classification Chart; Instructional Master 1B-1 (optional)	15
	Word Work: Slither		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Act It Out!	slips of paper; container [This activity requires advance preparation.]	20



Vertebrate Animals

3A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Ask students what *classification* means. Remind students as needed that classification is the grouping together of things based on how they are alike and the separating of things based on how they are different. Remind students that in the last read-aloud, they learned about cold-blooded and warm-blooded animals, and ask them to explain what it means for an animal to be cold-blooded or warm-blooded. Ask students which of Rattenborough's friends are cold-blooded (Tabitha the Toad, Paolo the Piranha, Anna the Anaconda) and which ones are warm-blooded. (Hilda the Hippo, Ebenezer the Egret) Ask students to name which vertebrate groups are cold-blooded and which groups are warm-blooded. (amphibians, fish, and reptiles—cold-blooded; mammals and birds—warm blooded)

Tell students that you are going to read some sentences. For each sentence, ask students to listen carefully and think about whether the description is an example of a cold-blooded animal or a warm-blooded animal. Some of the animals will be different from those they have heard about in the read-aloud. Remind students to think about the characteristics they have learned about cold-blooded and warm-blooded animals. Ask students to answer in complete sentences.

1. On a warm summer day, painted turtles will gather on a log sticking out of a river so they can bask in the sun. The sun's warmth will increase the turtles' internal body temperature. (The turtle is an example of a cold-blooded animal.)
2. A walrus's body is large and solid. It has a thick layer of blubber that helps it keep its body temperature constant. (The walrus is an example of a warm-blooded animal.)
3. Because an elephant lives in a hot climate, sometimes its body gets too warm. To keep its body temperature constant, extra heat is released from its large thin ears. Plus, it can use its ears as fans! (The elephant is an example of a warm-blooded animal.)

4. In the winter, a bullfrog hibernates to save energy while it sits on the bottom of a cold pond. In spring, when the water warms, the frog's body temperature will warm, too, allowing it to become active again. In very dry times, the bullfrog will estivate in the mud to keep from drying out. (The frog is an example of a cold-blooded animal.)

Purpose for Listening

Tell students to listen to find out why the backbone is so important to vertebrate animals.

Note: Students who participated in the Core Knowledge Language Arts program in Grade 2 will be familiar with some of the content about invertebrates and insects from the *Insects* domain.



Vertebrate Animals

← Show image 3A-1: Animals and their spines

1 [Pause for students to share.]

2 Who remembers what a vertebrate is?

3 [Point to the hippopotamus, and trace the dotted line that shows it has a backbone.] Were your predictions correct about Hilda Hippo having a backbone?

4 [Point to the egret.]

Hello, everybody. Rattenborough, world traveler and presenter of animals, back for another exciting day of slide show and tell! Last time, we classified, or grouped, animals as cold-blooded and warm-blooded. Yes, I am warm-blooded just like you! And how about my friend Hilda Hippo?¹ Yes, Hilda Hippo is also warm-blooded. We all have another characteristic in common, too, and that is what we are going to talk about today. We are all vertebrates.² That's right—vertebrates have backbones. And animals without backbones are called *invertebrates*. Because you and I are both vertebrates, we'll talk about vertebrates first. Let's take a look at the hippopotamus.³

When you look at the outside of an animal, you can't see the backbone because it is on the inside. But sometimes you can tell where the backbone is. Under a vertebrate's skin, there is a ridge. This is the backbone, or **spine**, that starts near its head and runs all the way down its back to its tail. Before we go any further, see if you can find your own spine, or backbone just like you did the other day. Reach around and rub the middle of your back. Remember those bumpy bones? Each bump you feel is a separate **vertebra**. They form a row from your neck all the way down your back to your tailbone. Your spine serves a very important purpose. Your spine protects your spinal cord, that large bundle of **nerves** that send messages from your brain to every part of your body.

For today, let's take a glimpse at the backbones of the five animal species to which my five friends belong. We've seen that a hippopotamus has a backbone. Next let's take a look at one of Ebenezer's fellow egrets.⁴ Its backbone, or spinal **column**, helps it to hold its head up high and protects its spinal cord. Like all egrets, Ebenezer could not live without his backbone. All birds have backbones, or vertebrae.

5 [Point to the anaconda.]

Snakes don't look like they have backbones, do they?⁵ Even though snakes **slither**—or slip and slide, along—they absolutely *do* have backbones! A snake's vertebrae, like Anna Anaconda's, run the length of its body and swing low to the ground as its muscles help it move along the ground or climb up trees. A pair of ribs is attached to each vertebra, protecting the body parts inside the snake's body. All reptiles have backbones. So, you can't always tell from the outside whether an animal is a vertebrate with a spine (backbone), or whether it's an invertebrate.

6 [Point to the piranha. Pause for students to share.]

How about fish? Would you say fish have a backbone?⁶ The answer is yes! All fish have backbones, too, just as reptiles, birds, and mammals do. It's very tricky to see, but if you took an x-ray of its body, you would see that all the other tiny bones that make up the skeleton of the fish are connected to its spine.⁷

7 [Show Image Card 14 (Fish Skeleton).]

Paolo told me that even though all fish have backbones, some fish—like sharks and stingrays—have backbones that are made of lighter and more bendable **cartilage** instead of hard bone, allowing them to be more flexible and travel more quickly.⁸

8 Touch your outer ear and the tip of your nose. They feel softer than bone because they are made of cartilage.

9 [Point to the toad.]

That leaves amphibians.⁹ Take a look at my animal friends one more time; pay close attention to the toad next to Tabitha. It's hard to tell when you look at a toad's body that there is a backbone inside! Now tell me—do toads have backbones?¹⁰ Yes, to be sure, they certainly do! Toads are vertebrates, too! All amphibians have backbones! That means that all five of the animals you've seen today are vertebrates. They all have backbones. The question I'm going to present to you, students, is this: Do all animals on Earth have backbones?

10 [Pause for students to share.]

11 [Pause for students to share.]

What are your predictions, boys and girls?¹¹ We know that mammals—which include hippopotami, me, and you; Birds, fish, reptiles, and amphibians—are all vertebrates, too. Haven't we covered all the animal groups on Earth?¹² Aha! Trick question! If you said "no," your predictions were correct.

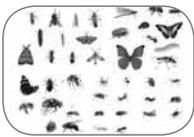
12 [Pause for students to respond.]

13 [Pause for students to share.]

14 [Show Poster 1 (Invertebrate and Vertebrate Graphic.)] What does this image show?

Do you remember if there are more vertebrates or more invertebrates on Earth?¹³ Good ideas! Look at this image that I shared with you earlier.¹⁴ Remember, more than ninety-five percent of all animal species are invertebrates, and insects are the biggest group of invertebrates. And there are still so many invertebrates yet to be discovered and classified!

As you can see in the image, vertebrates are actually only a teeny tiny group here on Earth. Because we tend to think and talk mostly about vertebrates, we sometimes forget that most of the animals in the world are actually invertebrates—and most of those are insects!



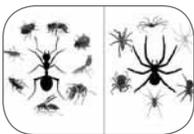
← **Show image 3A-2: Insects**

Think how many insects there must be on our planet! No wonder insects are the most plentiful group of organisms that have ever lived. They make up three quarters of all the species in the animal kingdom! Can you name a few of the many animals in the insect group?¹⁵ Flies, wasps, beetles, cockroaches, ladybugs, and butterflies are all insects. There are surely a lot more species of insects than there are species of amphibians, mammals, birds, fish, and reptiles all put together!

15 [Pause for a few students to share.]

Even though insects are by far the largest group of invertebrates, they are not the only invertebrates. Here's another question for you to think about. Close your eyes and pretend you are a taxonomist for a moment. Can you think of any other animals without backbones? Here's a hint: instead of internal vertebrae, these animals have an external, or outer, hard body covering.¹⁶

16 [Pause for students to share.]



← **Show image 3A-3: Insects and arachnids**

The largest group of invertebrates is made up of arthropods. Insects make up the largest group of arthropods. Another large group of arthropods includes arachnids.¹⁷ Spiders are arachnids, and so are ticks, daddy longlegs, and scorpions.¹⁸ Insects have six legs and three body parts. The ant in this image has very long antennae—they almost look like legs! In comparison, arachnids have eight legs and two body parts. Instead of having flexible

17 [Point to each type as you read.]

18 Look at the pictures showing the main body parts of an insect and an arachnid. Can anyone tell me why insects and arachnids are in different groups? [Pause for students to share. Some students may recall this information from the Grade 2 *Insects* domain.]

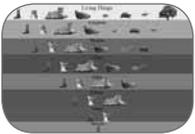
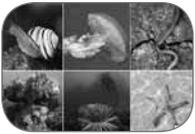
19 [Point out the variety of insects and arachnids in this image.]



20 The word *crustaceans* comes from the original Latin root word *crustace*, which means hard-shelled ones.

21 [Pause for a few students to share.]

22 [Point to the image of the blue crab.]



internal skeletons, all of the arthropods wear a tough **exoskeleton**, or protective covering, on the outside.¹⁹ I bet you can recognize some of these common examples of insects and arachnids.

← **Show image 3A-4: Crustaceans**

A crustacean is another kind of invertebrate, and also a type of arthropod. Crustaceans have exoskeletons and usually live in water.²⁰ Copepods are the smallest of the crustaceans. They are barely visible, but they are a very important source of food for fish in the ocean. Can anyone think of other animals that are classified as crustaceans?²¹ Good ideas! Some of the more common crustaceans include shrimp, lobsters, fiddler crabs and blue crabs. These animals all have a hard exoskeleton, which protects the body and keeps it from drying out.²² Have you ever seen a crab? If you eat a blue crab like this one or a lobster, you have to remove its hard exoskeleton to find the tasty meat inside.

← **Show image 3A-5: Other invertebrates**

Snails, jellyfish, and earthworms are also invertebrates. Other spineless creatures include coral, sea anemones, and sea stars. Many invertebrates are small and hidden and may not even seem like animals, but they are by far the largest group of animals populating the earth.

← **Show image 3A-6: Classification of a housecat**

What a lot of ways there are to classify animals! In order to study living things, taxonomists classify each organism according to its kingdom, phylum, class, order, family, genus, and species. The purpose of this classification system is to understand each organism better by the characteristics that make it unique. Vertebrates and invertebrates are two types of animals in the world of taxonomy. It is just one way of classifying animals, but I think it is a very helpful way, don't you? You and I may not look at all alike, or much like Ebenezer, Tabitha, or Anna, but we have a very distinct similarity to one another. We all have backbones!

23 [Point to each row of animals in the image as you share.]

24 What kingdom does the tree belong to? (the plant kingdom)

25 How is the grasshopper different from the rest of the animals shown here? (It's an invertebrate.) How is it similar? (It's an animal; it's living; etc.)

Look at this chart that shows how a group of familiar organisms are related to each other.²³ On the top row, you can see a group of living organisms: a housecat, a mountain lion, a tiger, a seal, a turtle, a grasshopper, and a tree. In the next row titled “Kingdom,” notice that one of the living organisms is no longer included: the tree. The tree actually belongs to a different kingdom.²⁴ This row now shows only organisms that are part of the animal kingdom. In the next row, titled “Phylum,” the grasshopper is no longer included.²⁵ All of the rest of the animals represented here are vertebrates, part of the *Chordata* phylum. In looking at the “Class” row, you may notice that the turtle is no longer included. The turtle is in the reptile class, and all of the other animals shown are mammals. In the row labeled “Order,” the mouse is not included because it is not a carnivore like the other animals shown. What’s true about all the animals in the next row, “Family”? That’s right; they are all different types of cats. In the “Genus” row, you can see that the housecat and mountain lion are more closely related than the tiger. And the very last row represents one specific animal, a *species* of housecat.

This process of starting out with many animals and ending up with just one is called the process of elimination. As we went down the list, we eliminated—or removed—any animals that no longer had anything in common.

The next time we get together, I will be showing you slides of fish—from tiny goldfish to gigantic sharks—and teaching about how scientists classify them according to their many different characteristics. You already know that fish are cold-blooded vertebrates. Be thinking about some other characteristics that scientists might use to classify fish. See you next time!

Comprehension Questions

15 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** For written responses in this domain, students will use their Classification Journals to collect source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

1. *Literal* What is a vertebrate? (an animal with a backbone)
2. *Literal* What groups of animals are considered vertebrates? (reptiles, amphibians, fish, mammals, and birds) [Write “vertebrate” for each animal group in the Classification Chart on display as students answer this question.]
 You may also wish to have some students fill out Instructional Master 1B-1 independently.
3.  *Evaluative* What is another name for the backbone in vertebrates? (spinal column) Why is the backbone or spine of vertebrates so important? (It protects the bundle of nerves—the spinal cord—which carries messages to the brain.)
4. *Inferential* The way in which each individual vertebra of a snake fits with the next one allows this animal to move with a special kind of movement. It allows the snake to _____. (slither)
5. *Inferential* What very large group of animals is not a vertebrate group? (insects) What are they called instead? (invertebrates) Why? (They don't have backbones.) [Point out that “Invertebrates” is already written on the chart in the Insects column.]
6. *Inferential* In the read-aloud today, you heard about one group of invertebrates called crustaceans, which includes lobsters and crabs. Why is the exoskeleton important to crustaceans? (It is the tough outer covering that protects its internal body parts.)

7. *Inferential* You heard today that some skeletons of vertebrates are made of bone, and some skeletons are made of a softer tissue called cartilage. What are some examples of vertebrates with a skeleton made of bones? (humans, frogs, some fish, birds, etc.) What is an example of a vertebrate with a lighter skeleton made of cartilage? (shark, stingray)
8. *Evaluative* How is a skeleton made of cartilage helpful to a shark or stingray? (Cartilage is more flexible and lighter than bone, which allows a shark or ray to swim faster and be more flexible.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

9.  *Evaluative Think Pair Share:* In the read-aloud today, you learned how the skeleton and bones of certain vertebrates allow them to live a certain way. How do you think the skeleton and bones you have help you live the way you do? Do you think that another type of skeleton and bones would be better? Why or why not? (Answers may vary, but students should include examples and vocabulary from the text.)
 10. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Slither

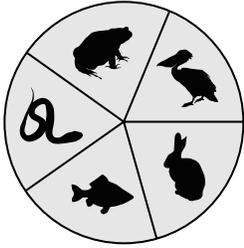
5 minutes

1. In the read-aloud today, you heard, “Even though snakes *slither*—or slip and slide—along, they absolutely *do* have backbones!”
2. Say the word *slither* with me.
3. When animals slither, they slide smoothly, often with a slight zigzag pattern.
4. The snake made no noise as it began to slither smoothly onto the rock to bask in the sun.
5. Have you ever seen a snake slither? What animals other than snakes can slither? Be sure to use the word *slither* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I think that _____ slither when they . . .”]
6. What’s the word we’ve been talking about? What part of speech is the word *slither*?

Use an *Acting and Sharing* activity for follow-up. Directions: Turn to your partner and use your arm to show them what slithering looks like. Then share with your partner if you would like to be able to slither like a snake or not. Tell why or why not. Be sure to use the word *slither* in a complete sentence as you share.



Complete Remainder of the Lesson Later in the Day



Vertebrate Animals

3_B

Extensions

20 minutes

Act It Out!

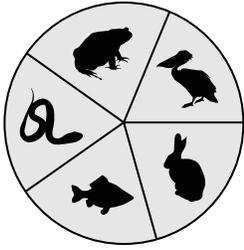
Tell students that they are going to act out some animals that have been mentioned in today's read-aloud. Talk about how the actor should use actions that are characteristic of each animal. Ask students to think about how to portray, or show, some of the characteristics and behaviors that will help the class identify the animal.

Ask a student to choose a piece of paper from the container of names that you prepared earlier. (crab, spider, daddy longlegs, toad, snake, hippopotamus, egret, piranha, shark, cockroach, butterfly) Instruct each student to include clues that show whether the animal is warm-blooded or cold-blooded, and whether the animal is a vertebrate or an invertebrate. If students need additional help, you might prompt them to think about questions like these:

- Does it cool itself in the water?
- Does it bask in the sun?
- Does it burrow into the mud?
- Does it have a hard exoskeleton?
- Does it have a ridge of backbone on its body?

As each student acts out an animal, encourage other students to observe carefully. Ask students to raise their hand if they think they know what the animal is. When a student is called on to guess the animal, first ask the student to state whether they think the animal is cold-blooded or warm-blooded, and whether they think the animal is a vertebrate or an invertebrate.

If you have time for discussion, you may want to give students a chance to share the acting clues that were helpful evidence in identifying the animal. Encourage students to use domain-related vocabulary in the discussion whenever possible.



Fish: Fins and Gills

4

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✓ Observe and describe basic characteristics of an animal
- ✓ Explain that scientists classify animals by common or shared characteristics
- ✓ Explain that scientists classify animals in order to study them and show relationships
- ✓ Classify particular animals as vertebrates or invertebrates
- ✓ Classify particular animals as cold-blooded or warm-blooded
- ✓ Identify fish, amphibians, reptiles, birds, and mammals as groups of vertebrates
- ✓ Identify basic characteristics of fish
- ✓ Classify particular animals as fish
- ✓ Compare and contrast two groups of vertebrates

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Fish: Fins and Gills” (RI.3.7)
- ✓ Interpret information about the surface of Earth and about animal characteristics and their classifications from diagrams, charts, graphs, and graphic organizers (RI.3.7)

- ✓ Compare and contrast the characteristics of a fish and a human and their relative classifications in “Fish: Fins and Gills” (RI.3.9)
- ✓ Make personal connections to aquatic experiences in “Fish: Fins and Gills” (W.3.8)
- ✓ Gather information from the text and images of “Fish: Fins and Gills”; take brief notes and sort evidence into provided categories (W.3.8)
- ✓ Classify and organize the characteristics of fish (W.3.8)
- ✓ Make predictions about which group of vertebrates is being described prior to “Fish: Fins and Gills” based on the title, images, and text heard thus far, and then compare the actual outcomes to predictions (SL.3.1a)
- ✓ Summarize (orally and in writing) information about the characteristics and classification of fish (SL.3.4)
- ✓ Choose words and phrases to effectively describe the characteristics of fish (L.3.3a)
- ✓ Use a known root word as a clue to the meaning of an unknown word with the same root, such as *animal* and *animalia* (L.3.4c)
- ✓ Draw illustrations to represent the characteristics of fish from “Fish: Fins and Gills”

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

aquatic, *adj.* Having to do with water

Example: Linda loves aquatic sports; her favorite is water skiing.

Variation(s): none

fertilizes, *v.* Makes ready for development

Example: After the rooster fertilizes the hen’s eggs, the eggs are complete and able to grow into new baby chicks.

Variation(s): fertilize, fertilized, fertilizing

gills, n. The organs that fish use to breathe the oxygen in water
Example: Whereas land animals use their lungs to breathe the oxygen in air, fish use their gills to breathe the oxygen in water.
Variation(s): gill

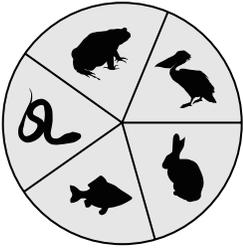
lungs, n. The breathing organs of vertebrates that breathe oxygen
Example: Makayla drew a deep breath into her lungs as she dove into the pool to swim its entire length underwater.
Variation(s): lung

respiratory, adj. Having to do with the act of breathing
Example: When Erica became sick with a cough and fever, her mother realized she was sick with a respiratory infection.
Variation(s): none

scales, n. The many small, hard plates that cover the skin of most types of fish
Example: Clownfish have bright, colorful, orange and white scales.
Variation(s): scale

spawn, v. To deposit eggs into the water which then become fertilized, or ready for development
Example: Most fish spawn as the first step in reproducing, or making new fish.
Variation(s): spawns, spawned, spawning

<i>At a Glance</i>	Exercise	Materials	Minutes
Introducing the Read-Aloud	What Have We Already Learned?	Poster 2 (All My Best Friends Represent Vertebrates!)	10
	Inferring from Clues		
	Purpose for Listening	Classification Journals; index cards	
Presenting the Read-Aloud	Fish: Fins and Gills	world map or globe	20
Discussing the Read-Aloud	Comprehension Questions	Classification Chart; Classification Journals	15
	Word Work: Aquatic		5
 Complete Remainder of the Lesson Later in the Day			
Extensions	Raise Your Hand If...	Classification Chart	20
	Brainstorming About Fish	Classification Chart; Instructional Master 4B-1; Instructional Master 1B-1 (optional)	



Fish: Fins and Gills

4_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Remind students that in the previous read-aloud they learned about vertebrates and invertebrates. Ask students how many groups of vertebrate animals there are. (five) Show students Poster 2 (**All My Best Friends Represent Vertebrates!**). Tell them that there's a fun and easy way to remember the names of the five animal groups that Rattenborough's good friends belong to. Introduce the mnemonic **All My Best Friends Represent Vertebrates**. Have students repeat this mnemonic chorally. Now go over what each letter stands for: 'A' for Amphibians; 'M' for Mammals; 'B' for Birds; 'F' for Fish; 'R' for Reptiles; and 'V' for Vertebrates, having students join in with you for each group's name. Count with students the number of letters (six), and then ask which letter is *not* the name of one of the five groups. ('V' for vertebrates) Explain that the sixth letter and word helps to make this memory aid make sense and names the bigger group the five groups belong to.

Next, review with students why scientists classify animals, and talk about some characteristics that are used to classify animals. Ask, "Who can tell me two of the physical characteristics scientists use to classify animals?" Have students share what they recall about the terms *cold-blooded/warm-blooded* and *vertebrate/invertebrate*. Remind them that even though a lot of the animals we see and think about and talk about are vertebrates, they are only a tiny percent of the animal population on Earth and are far outnumbered by many types of invertebrates.

Inferring from Clues

Tell students that today they will hear more about one of the groups of animals, and you are going to give them clues so they can predict which group it will be. Give students one clue at a time about which group of animals they will hear about. After each new clue is given and the possibilities are narrowed, allow students to share new predictions and ideas.

- I am a cold-blooded member of the animal kingdom.
- I am a vertebrate.
- I am found swimming in fresh water or salt water.
- I move around by using my fins, and I breathe oxygen through my gills underwater.
- If I don't swim away fast enough from humans and they pick me up, they will feel the hard scales that cover my body, and they may even eat me!

Ask students what the correct answer is. (fish) Ask them if their predictions were correct and to explain why or why not.

Purpose for Listening

Ask students to share with a partner in one sentence one thing they would really like to learn about fish. Tell students that if they'd like, they can start their sentence with, "One thing I'd like to learn about fish is..."; or they can write a direct question such as "Why do fish... ?"

Each student will write down the one thing his/her partner wants to know on an index card. When both partners have had the opportunity to write a sentence about what the other would like to know, have them read their sentences to each other. Give them time to clarify meaning and make corrections in expressing their partner's ideas. Tell students that they need to listen carefully to today's read-aloud to learn more about the fish group and to possibly learn the answer to their question or discover what they would like to know about fish.



Fish: Fins and Gills

← Show image 4A-1: Rainforest with Paolo

Hello everyone! I'm back after a delightful rest! Today I'm going to tell you more about my friend Paolo Piranha and the group to which he belongs. So far, you've learned that scientists classify living things by common characteristics in order to study them and show relationships.

You have learned about cold-blooded and warm-blooded animals. Who remembers if Paolo is cold-blooded or warm-blooded and can explain what that means? ¹ Ah, bravo! Right! Paolo Piranha's internal body temperature varies with his surroundings. When Paolo is swimming in warm water, his body temperature is higher than when he is swimming in cold water. His body temperature is not constant; it makes adjustments to the surrounding temperature easily.

Who remembers another way scientists classify animals? I'll give you a hint. It has to do with bones. ² Right! Some animals have backbones—what's another word for animals with backbones? Yes, animals with backbones are called vertebrates. And those without backbones are called . . . ³ Paolo is one of many kinds of animals capable of swimming. Having a strong backbone is one type of body design that helps Paolo and other fish to be good swimmers.

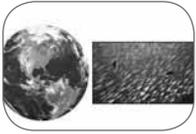
You have also learned a little bit about taxonomy, the science of classification. Fish are members of Animalia [an-uh-MAY-lee-uh], or the animal kingdom, just like you and me, but they belong to a different animal group. ⁴ You are a mammal like Hilda Hippo and myself, Ebenezer is a bird, and Paolo is a fish! Fish are vertebrates and they are cold-blooded. There are many different types and sizes of fish, represented by many species. Today I'm going to teach you a little more about **aquatic** species of animals that are classified as fish. So, to say that in three words: fish are aquatic! They don't live on land. They live in water! All species of fish are aquatic.

1 [Pause for a few students to share.]

2 [Pause for a few students to share.]

3 [Pause for students to fill in blank.] (invertebrates)

4 What word do you hear in *animalia*? *Animalia* is Latin for *animal*.



← **Show image 4A-2: Earth's oceans and fish**

5 Describe what you see in this image. All the blue represents water. Is there more land or water on Earth? [Pause for students to share.]

6 [Point to the Dead Sea on a world map or globe.] The Dead Sea is in an area you may remember learning about in first grade called the Middle East, where Egypt and Jerusalem are. Why do you think this sea has the name "Dead Sea"?

Fish make up the largest group of vertebrates on Earth. Let's take a look at my slide that shows a view of planet Earth from space.⁵ There is a *lot* more water than land. Nearly three quarters of the earth's surface is covered by water. Fish are swimming about in the earth's waters—from ponds and streams to rivers, lakes, and oceans. They have adapted to almost every water habitat on Earth except for some very hot springs and the extremely salty Dead Sea.⁶ Aside from these places, fish can live anywhere! It's no wonder that fish make up the largest group of vertebrates on Earth.

Most of those wet, watery fish habitats are salty because most of the earth's water is salt water. If you ever swim in the ocean, you may get a little taste of the salty sea. Sharks, cod, and flounder are all saltwater fish.



← **Show image 4A-3: Trout and salmon**

7 [Pause for students to share.]

Freshwater fish live in lakes, rivers, streams, and ponds. What do you think fresh water is?⁷ Bass and trout are common freshwater fish, and some humans actually find them very tasty. Come to think of it—I find fish quite delicious when I can get my paws on fish scraps!

Some fish, such as salmon, spend part of their lives in freshwater rivers and part in the salty seawater. Salmon begin their lives in rivers where they stay for anywhere from six months to three years, depending on the species. Then they make an often-dangerous journey out to sea, facing predators and changing water temperatures along the way. They live in the saltwater ocean for about four years before returning to the freshwater rivers to lay their eggs. Their migration often covers several hundred miles.



← **Show image 4A-4: Amazon River and piranha**

8 [Pause for students to share.]

Let's stop for a moment to think about the different ways that taxonomists classify Paolo, a South American piranha from the Amazon River. He's a cold-blooded, aquatic vertebrate. He's a fish to be sure. The question is whether he is a saltwater fish or a freshwater fish. Which of these types of water is his home?⁸

That's right! A freshwater river. Paolo's home is the Amazon River, one of the largest rivers in the world. Piranhas live in freshwater environments, mostly rivers, so they are classified as freshwater fish.

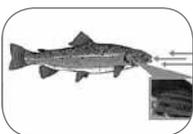


← **Show image 4A-5: Red-Bellied Piranha**

Sometimes animals are classified by their physical characteristics. Though piranhas do have very sharp teeth, they are not the bloodthirsty carnivores they are sometimes perceived to be, always ready to attack humans. Indeed, members of the red-bellied species of piranha do hunt the meat of other fish in large groups, but that's not all they eat. Most piranhas are omnivores. You have reviewed carnivores and omnivores earlier in this domain. Who can tell me what the difference is?⁹ That's right—as omnivores, most piranhas eat both animals and plants, eating seeds and fruit that fall into the water. Many piranhas also feed on carrion, animals that have already died. You will continue to hear about the different foods that many different animals eat—this will help you describe animals. Later you will hear about how the shape and size of animals' teeth give you clues about what they eat.

9 [Pause for students to share.]

So, you already know several common characteristics of fish. But there are more. Can you think of any others? I'll give you a hint. You know that all animals need to breathe oxygen in order to live. Fish do not have **lungs**, so we have to wonder how in the world—or in this case under water—do they breathe?



← **Show image 4A-6: Diagram of fish**

Look closely at this fish and see if you can spot its breathing machine. The **respiratory**, or breathing, organs of a fish are called **gills**. All fish have gills. They take water in through their mouths and the water passes over their gills. The gills take in oxygen from the water, allowing them to breathe. *You* will die quickly if you don't get enough air because you draw oxygen out of the air. But fish will die quickly if they do not have water, because their oxygen comes from water.

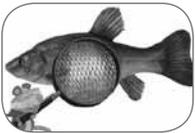
The African lungfish is the only fish I know that has lungs in addition to gills and can survive out of the water. We call this an

exception to the rule, or a “pattern-breaker.” Before the dry season, when the water dries up and leaves a sun-baked riverbed behind, the lungfish buries itself deep in the mud and builds a cocoon-like sheath around itself, staying there for a year or more until water returns to the river. Okay then, fish breathe with gills, and you breathe with lungs. That’s one big difference between you and fish. What’s another?



← **Show image 4A-7: Child snorkeling and fish swimming**

Think about how you swim—with your arms and legs, of course! Take a close look at the fish. Do you see any arms and legs? Nope! So, what helps a fish move through the water? Yes, a fish has fins—all kinds of fins! It has fins on the sides of its body for steering, fins at the back for powerful speed, and fins at the top and bottom to help keep balance. Fish couldn’t begin to move without those wonderfully flat fins and their flexible tails. Have you ever worn flippers? Flippers are designed to be like fish tails to help people move more quickly through the water.



← **Show image 4A-8: Fish scales**

Well, everybody, you’ve spotted the gills and fins of a fish, but what about the rest of a fish’s body—what about the skin? Hey! Look at me! There I am, taking a close look at fish skin through my magnifying glass. Fish skin is very different from your skin. Fish have scaly skin to help protect them and help them move more easily through the water. These hard overlapping **scales** are rounded and smooth. And fish have more than one layer of skin—just like you!¹⁰

Many scientists believe that fish appeared in the oceans more than 400 million years ago. It’s hard to imagine how many fish live in all of the earth’s waters today. More than thirty thousand species are known, but a vast amount of the world’s oceans have yet to be explored. What scientists actually know for certain is like one drop of water in a vast bucket! Scientists discover more and more all the time. Maybe one day you will be one of those scientists who will discover something new!

10 [Point to the scales in the image.]
The scales on fish are small, hard, protective coverings over the true skin that is underneath.



← **Show image 4A-9: Fish eggs and shark mother with baby**

Most fish—such as salmon, goldfish, tuna, and eel—**spawn**, or reproduce, in a very unique way. When fish spawn, the mother releases her eggs into the water and the male **fertilizes** them, or makes them complete and able to grow into baby fish. Once these soft eggs are fertilized, they are often buried along the river bottom. Here, they develop and eventually hatch into tiny fish called larvae [*LAHR-vee*], the early form of fish. Some sharks, on the other hand, are among the few examples of live-bearing fish. Almost the opposite of external spawning, the mother shark’s eggs develop internally, remaining inside her body until they are born as live young, rather than as eggs.¹¹

11 If you look closely at the image, you may be able to see the baby shark next to its mother.



← **Show image 4A-10: Bony fish, cartilaginous fish, and jawless fish**

Taxonomists have another way of grouping fish. They have divided all fish into three classes, or classifications. Most fish belong to the class called bony fish. These fish have skeletons that are made of hard, bony material. Most of them have a swim bladder, kind of like an internal “floatie,” which helps them float. Perhaps you know of some fish that are considered bony fish—bass, clownfish, minnows, and sunfish are just a few! Another smaller class has some well-known members. As you have heard earlier, fish like the shark and the stingray have skeletons made of cartilage. This class of fish has tooth-like scales, and some of them breathe through spiracles—small gill openings on the tops of their heads! The last class of fish is not as familiar to most of us—these fish are jawless and include some interesting members like the hagfish and the lamprey.¹²

12 [Point to the three different classes of fish in the image.] What do you think *jawless* means? (without a jawbone)

Earth’s underwater world—Paolo’s world—is a fascinating place, much of which has not yet been explored. Perhaps some of you will become scientists and study aquatic creatures like Paolo. Today, we’ve only talked about fish, but not all sea animals are fish. There are many other vertebrates in the ocean, such as dolphins, sea snakes, and sea turtles. The sea is also home to tens of thousands of species of invertebrates—animals you may have seen before, such as crabs, clams, sand dollars, and squid.

13 [Pause for a few students to share.] (cold-blooded; vertebrates; have gills, scales, and fins; bony or cartilage skeletons; live in water; most lay eggs)



14 [Point to the corresponding animal as you read each description.]

Let's review the characteristics of fish. How many fish characteristics can you name? ¹³ Great job! Now, I'm going to read you some riddles of sea creatures. See if you can identify which ones are fish and which ones are not.

← **Show image 4A-11: Jellyfish, eel, seahorse, and humpback whales** ¹⁴

1. I am a jellyfish. My soft body has no bones, and I have neither gills nor lungs for breathing. Oxygen moves easily through my thin skin. Sometimes I lay eggs, but I may also give live birth. I am cold-blooded and will surely die if left out of water. (No, I am not a fish, even though the word is in my name; I am classified as an invertebrate.)
2. I am a cold-blooded eel. My slimy, snakelike body is covered in scales and hides my backbone from view. I have gills and fins, and I lay my eggs in the water where I live. (Yes, I am a fish.)
3. I am a sea horse. My long body is encased in bony rings. I breathe with gills, and my fins help me glide through the water. I am the male, and I carry eggs in my pouch until they are ready to hatch. (Yes, I am a fish.)
4. I am a whale, one of the largest animals of the sea. I breathe with lungs and give birth to live babies. Even though I am not covered in hair, I do have a few bristles of hair here and there on my head. (No, I am not a fish, but I am a vertebrate. I am a mammal.)

Sorting aquatic creatures is not as easy as it looks, is it? Next time, things will be even more interesting as we learn about some aquatic animals that can live on land as well. How do you think they can do that? ¹⁵ You will find out more the next time we meet!

15 [Pause for students to share.]

Comprehension Questions

15 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** For written responses in this domain, students will use their Classification Journals to collect source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

Note: Fill in the Classification Chart where appropriate as you move through the comprehension questions. If students bring up a pattern-breaker in their responses, be sure to include that in the appropriate column.

1. *Inferential* What does *aquatic* mean? (having to do with water) In what sort of aquatic habitats do fish live? (Fish live in fresh water—lakes, rivers, streams, ponds, or salt water; some fish can live in both fresh water and salt water.)
2. *Inferential* What is a fish doing when it spawns? (laying eggs, some of which become fertilized during the reproduction process)
3. *Inferential* Describe the function of the respiratory organs of a fish. (They help fish breathe oxygen.) Name the organ that allows fish to breathe underwater, similar to the way the lungs help humans breathe. (Fish use their gills to take in oxygen from the water.)
4. *Inferential* Why are scales an important physical characteristic of fish? (They offer protection and help them move through water.)
5. *Literal* How do fish move through the water? (They use their fins and tails.)
6. *Evaluative* You and a friend are discussing whether or not a shark is a fish. How would you convince your friend that a shark is a fish? (Like other fish, sharks live in water and have gills through which they take in oxygen; they have scaly skin; their tail and fins help them move through the water.)

7.  *Evaluative* In your Classification Journal, write the word *fish* at the top of a clean page. Now write two to three complete sentences which describe the characteristics of the group of animals called fish. (vertebrate; cold-blooded; live in water; have scales, gills, and fins; reproduce by laying eggs; etc.) [Tell students they may look at the Classification Chart on display if they would like.]
8.  *Evaluative* Name some things that fish and humans have in common. (Both breathe oxygen; both can move through water; both are vertebrates; both could be omnivores.) Name some ways that fish and humans are different. (Humans don't breathe water or have gills; they use lungs to breathe air. Fish breathe in water and must live in water to survive; etc.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

9.  *Evaluative Think Pair Share:* If you were telling someone about fish, would you say there is a large number of fish in the world, or a small number of fish? Explain your answer. (Guide students to realize that if fish live everywhere there is water, there are many, many fish in the world because most of the earth is covered by water. There are fish in both salt water and fresh water.)
 10.  After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions? Have students reread the question they wrote on an index card before the read-aloud. Ask a few volunteers to share their questions along with the answer they heard, or to share just the question even if there was no answer. For students who may not have received answers to their questions, ask them to circle the question. You may want to have those who did receive answers place a check mark next to their question. Students will keep these index cards tucked inside their Classification Journals. You may advise students that it is possible they may hear an answer later in another read-aloud.
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Aquatic

5 minutes

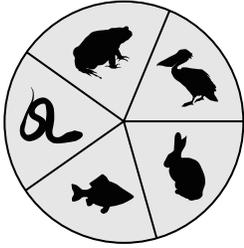
1. In the read-aloud you heard Rattenborough say, “Today I’m going to teach you a little more about the *aquatic* species of animals that are classified as fish.”
2. Say the word *aquatic* with me.
3. *Aquatic* means having to do with water.
4. Eli visited the pet store every weekend because he loved to watch the turtles swimming and playing in their aquatic environment.
5. Have you ever seen something that was aquatic? Where were you? Would you consider yourself to be aquatic? What aquatic activities do you do? Be sure to use the word *aquatic* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “At the creek we watched aquatic animals . . .” or “I like the aquatic activity of . . .”]
6. Have you ever heard of something described as aquatic? What part of speech is the word *aquatic*?

Use a *Making Choices* activity for follow-up. Directions: I am going to say a phrase that describes something that is aquatic or not aquatic. If the phrase is about something that is aquatic, say, “That is aquatic.” If the phrase is not about something aquatic, say, “That is not aquatic.”

1. a monkey swinging from branch to branch in the jungle (That is not aquatic.)
2. raking leaves in the yard (That is not aquatic.)
3. swimming in a lake (That is aquatic.)
4. walking to the cafeteria (That is not aquatic.)
5. a dolphin jumping and diving in the waves (That is aquatic.)
6. the huge tank of ocean animals in the aquarium (That is aquatic.)
7. doing cartwheels and flips on the trampoline (That is not aquatic.)



Complete Remainder of the Lesson Later in the Day



Fish: Fins and Gills

4_B

Extensions

20 minutes

Raise Your Hand If . . .

Tell students that they are going to complete a warm-up activity before they complete their brainstorming session about fish. Explain that you will begin with the phrase, “Raise your hand if,” and then you will add a second phrase about the characteristics of fish. Tell students to raise their hands if the statement is a true statement regarding the classification of fish. Clarify that for this warm-up, the characteristics discussed will describe the majority of the animals in this group, and that pattern-breakers will not be included. Also tell students that they may refer to the Classification Chart for information as needed.

1. Fish are warm-blooded.
2. Fish have backbones. (Raise hands.)
3. The habitats fish live in are aquatic. (Raise hands.)
4. Fish breathe oxygen in water using gills. (Raise hands.)
5. Fish have feathers.
6. Fish have scales. (Raise hands.)

Brainstorming About Fish (Instructional Master 4B-1; 1B-1, optional)

Using the Classification Chart on display in the room and Instructional Master 4B-1, students will gather information as reinforcement and also as notes for the formal paragraph assignment they will write later in this domain.

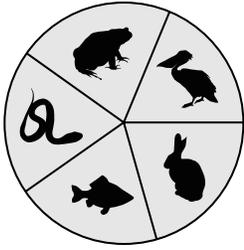
On Instructional Master 4B-1, students will write the name of the vertebrate animal group they have learned about today in the central oval. (fish) Then, in each of the surrounding ovals, students will write words and/or phrases that describe the characteristics of animals in that group. They should also include in one of the surrounding ovals examples of animals in this group based on what they heard in the read-aloud today.

In the central oval and/or on the back of the worksheet, have students illustrate an animal they learned about today.

Tell students they will refer back to these Brainstorming Graphic Organizers when it comes time to write their paragraphs—that these ideas will be their notes/research at that time.

Note: You may guide students through this activity as a whole group, place them into small groups, or have them work with partners as you see fit.

➤ You may wish to have some students fill out Instructional Master 1B-1 independently along with 4B-1.



Amphibians: From Water to Land

5

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✓ Observe and describe basic characteristics of an animal
- ✓ Explain that scientists classify animals by common or shared characteristics
- ✓ Explain that scientists classify animals in order to study them and show relationships
- ✓ Classify particular animals as vertebrates or invertebrates
- ✓ Classify particular animals as cold-blooded or warm-blooded
- ✓ Identify basic characteristics of amphibians
- ✓ Classify particular animals as amphibians
- ✓ Compare and contrast two groups of vertebrates

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Determine the literal and nonliteral meanings of and appropriately use common sayings and phrases, such as “don’t judge a book by its cover” (RI.3.4) (L.3.5a)
- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Amphibians: From Water to Land” (RI.3.7)
- ✓ Interpret information about animal characteristics and their classifications from diagrams, charts, graphs, and graphic organizers (RI.3.7)

- ✓ Compare and contrast the characteristics of a salamander and a lizard, and of amphibians and fish, and their relative classifications in “Amphibians: From Water to Land” (RI.3.9)
- ✓ Gather information from the text and images of “Amphibians: From Water to Land”; take brief notes and sort evidence into provided categories (W.3.8)
- ✓ Classify and organize the characteristics of amphibians (W.3.8)
- ✓ Make predictions about how the meaning of the word *amphibian*—“living two lives” or “two worlds”—relates to this group of vertebrates, and whether amphibians are similar to or different from fish, prior to “Amphibians: From Water to Land,” based on the title, images, and text heard thus far, and then compare the actual outcomes to predictions (SL.3.1a)
- ✓ Summarize (orally and in writing) information about the characteristics and classification of amphibians (SL.3.4)
- ✓ Choose words and phrases to effectively describe the characteristics of amphibians (L.3.3a)
- ✓ Use a known root word as a clue to the meaning of an unknown word with the same root, such as *morph* and *metamorphosis* (L.3.4c)
- ✓ Draw illustrations to represent the characteristics of amphibians from “Amphibian: From Water to Land”

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

amphibians, *n.* A group of animals that are cold-blooded, live in water and on land, and lay eggs—most of which have moist skin

Example: The frog, an amphibian, swam to the edge of the pond to lay its eggs.

Variation(s): amphibian

dormant, *adj.* Existing in a state of rest or inactivity

Example: The bullfrog stays dormant during the winter by lying on the bottom of the pond where it can be inactive and still take in the oxygen-rich water.

Variation(s): none

evolved, v. Developed gradually over a long period of time
Example: Martin’s ideas evolved as he created his story.
Variation(s): evolve, evolves, evolving

fluctuates, v. Shifts back and forth
Example: The price of gasoline fluctuates often; the price is different every time my mom fills the gas tank in our car!
Variation(s): fluctuate, fluctuated, fluctuating

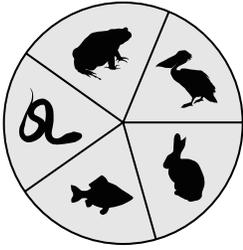
morph, v. To change form
Example: Filmmakers can morph one image into another using special effects.
Variation(s): morphed, morphs, morphing

shed, v. To drop, cast off, or separate from something
Example: Anna thought she saw a snake, but when she poked it with a stick, she realized it was just a snakeskin that a snake had shed and left behind.
Variation(s): sheds, shed (past tense), shedding

transformation, n. Changing appearance
Example: I was surprised by my older sister’s transformation when she dressed up and got her hair cut to get ready for the dance.
Variation(s): transformations

wetlands, n. Land that has moist soil and is covered with shallow water
Example: After amphibian eggs hatch and the tadpoles grow up, many amphibians leave the wetlands for woodland habitats.
Variation(s): wetland

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	Classification Chart	10
	Essential Background Information or Terms		
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Amphibians: From Water to Land		20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	Classification Chart	15
	Word Work: Shed		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Raise Your Hand If . . .	Classification Chart; Instructional Master 5B-1; Instructional Master 1B-1 (optional)	20
	Brainstorming About Amphibians		

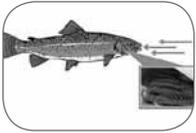


Amphibians: From Water to Land

5A

Introducing the Read-Aloud

10 minutes



What Have We Already Learned?

← Show image 4A-6: Diagram of Fish

Ask students to describe what they see and how it relates to what they have learned. Ask them which of Rattenborough’s friends is a fish. (Paolo the Piranha) Review with them that fish make up the largest group of the five vertebrate groups of animals. Ask, “Where do fish live?” (fresh water and salt water) Using the Classification Chart as a guide, prompt a discussion that reviews the main characteristics of fish—that fish are aquatic, cold-blooded, breathe using gills, are able to move through the water using their fins and tails, and most reproduce by spawning eggs.

Essential Background Information or Terms

Tell students that in today’s read-aloud, they will learn more about another group of animals: amphibians. Explain to students that the word *amphibian* means “living two lives” or “living in two worlds.” Ask students to predict what they think this means as it pertains to the amphibians animal group.

Purpose for Listening

Tell students to listen to find out if their predictions are correct and to learn more about amphibians. Also have students predict if amphibians have characteristics that are similar to fish or different from fish.



Amphibians: From Water to Land

← Show image 5A-1: Rainforest with Tabitha

I'm back, everybody, and today I've brought some excellent slides of Tabitha Toad and Paolo Piranha to show you, so we can compare how scientists classify them in the taxonomy of animals. Tabitha is not a fish, but she and Paolo are similar in many ways. It's true that Tabitha and Paolo don't look very much alike, but as the saying goes, you can't judge a book by its cover.¹ When classifying animals, scientists often search for similarities as well as differences.

1 Who can tell me what this saying means? (You cannot always tell everything about something just by its appearance.)

One similarity between Tabitha and Paolo is that, as you know, they are both members of the animal kingdom. You've learned that scientists classify animals as cold-blooded or warm-blooded. Does anyone know to which category Tabitha belongs? Do you think that her body maintains a constant internal temperature like yours, or does her temperature adjust to her surroundings like a fish does?² Yes, her body temperature **fluctuates**, so she is classified as a cold-blooded animal like Paolo. That's another way that they are similar to one another. They are both animals and they are both cold-blooded.

2 [Pause for students to share.]



← Show image 5A-2: Toad, and toad with vertebrae

Now take a closer look at Tabitha Toad. Can you tell just by looking at her whether she is cold-blooded or warm-blooded? No, but once you learn a bit more about her habits you will understand how scientists determined that she is cold-blooded. You know that scientists also classify animals according to whether or not they have backbones. Think about what you learned about Tabitha's backbone.³ Yes, there it is! Just like you and Paolo, Tabitha has vertebrae, a column of bones, all down her back. Who remembers what scientists call animals with backbones?⁴ Right! She's a vertebrate!

3 [Point to the image.]

4 [Pause for students to share.]

5 [Pause for students to share.]
(Fish live in water, breathe with gills, have fins and scales, have bony or cartilage skeletons, and most lay eggs.)

6 [Pause for students to share.]

7 Who remembers what the word amphibian literally means? (“living two lives” or “living in two worlds”) Were your predictions correct about the how the meaning of the word *amphibians* relates to the animals?

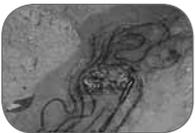


So, Paolo and Tabitha are both cold-blooded vertebrates. Does anyone remember any other fish characteristics?⁵ Good answers! Make a prediction about which characteristics Tabitha shares with Paolo. Do Tabitha and other toads have gills, scales, or fins? Do they lay eggs? Or live in water? These are rather tricky questions because toads belong to a group of animals that change during their lifetime. Their bodies change, their habits change, and their habitats change. I’m going to share lots of information with you today, so get ready for some miraculous surprises.

Before we go any further, I want to introduce the name of Tabitha Toad’s group of animals. Some of you may know it already. How do scientists classify toads?⁶ Yes, they are members of a class of animals known as **amphibians**. Most amphibians spend part of their lives in water and part on land.⁷

← **Show image 5A-3: Tabitha jumping in and out of the water**

Toads love the water. Like all amphibians, Tabitha began her life as an aquatic animal, living in water. She spends most of her time on dry land now. In fact, she loves the woodlands, but every spring she makes her way to a small freshwater pond in the **wetlands** to lay her eggs. That’s why Tabitha was in the wetlands when I took this picture of her. Just before I took this picture, she laid a few thousand eggs in the shallow water. Toads must lay their eggs in water because their soft jelly like coverings can easily dry out in the air. Come and see!

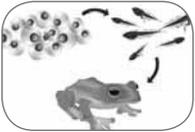


← **Show image 5A-4: Toad eggs**

Like fish, amphibians reproduce by spawning. A male toad fertilized these eggs after the female deposited them in the water. Soon many of them will hatch into larvae, just like fish eggs do. But most of the eggs will never hatch. Can anyone think of why this is so?⁸ There are many ways that eggs can be destroyed: by becoming a tasty meal for a predator, being washed away in a flood, or drying up if there’s not enough rain. The small percentage of eggs that do hatch will move on to the next stage of development.

8 [Pause for students to share.]

9 Notice how the word *morph* is part of the word *metamorphosis*. What other animals morph? (caterpillars into butterflies or moths)



This is the larvae stage of most frogs, toads, and salamanders. We call them tadpoles. Tadpoles have gills, just like fish, and use their gills to breathe underwater. They are herbivores and eat tiny aquatic plants, but they're in constant danger because other fish can swallow them whole. Most tadpoles don't survive, but those that do survive undergo a miraculous change. They **morph**, or change, into very different looking creatures with very different habits. This **transformation** process of changing appearance from one stage to another is called metamorphosis.⁹

← Show image 5A-5: Tadpole's metamorphosis

As tadpoles grow, skin begins to cover their gills, and they grow lungs so that they are able to breathe air on land. Tiny legs appear. They begin to look more like land creatures as their tails disappear. Several species of frogs that live in the wet tropical rainforest skip the tadpole stage; their eggs hatch and the young are miniature versions of the adult frogs. The Surinam toad's eggs develop in pores on the adult's back until they emerge fully developed! Those amphibians that survive to adulthood will be hopping and crawling around on land, searching for food, just like Tabitha. Plant life will no longer interest them. Instead, they'll snatch up bugs, worms, spiders, and slugs with their sticky tongues. Most adult amphibians are carnivores. Some of the toad's larger relatives, like bullfrogs, even eat small mammals and birds. The world's biggest frog is the West African Goliath frog. It is the size of a pet cat and eats other frogs, baby crabs, and snakes.

Frogs and toads are the largest group of amphibians. Because they have so many of the same characteristics, many people have a difficult time telling them apart. The main difference between them is that toads' skin is a bit drier than frogs' skin. Remember that although together they make up the largest group of amphibians, they are not the *only* group of amphibians. In order to study amphibians better, scientists classify them into three separate groups.

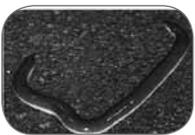


10 [Pointing to the image, have students describe what they see. Ask them to compare and contrast the salamander and lizard.]

← **Show image 5A-6: Salamander and lizard** ¹⁰

Have you ever seen a salamander? Scientists classify salamanders and their close relatives, newts, as a second, separate category of amphibians. Perhaps you've seen these four-legged, tailed animals while hiking in the woods or even in your own backyard! Sometimes salamanders are confused with lizards, but salamanders are amphibians. Lizards belong to another group of animals that we will talk about another day.

Skin is one of the amphibians' most important organs. Tabitha, and other toads like her, have skin that is dry and leathery. Other amphibians have slimy skin because their skin needs to stay moist in order for them to breathe. Amphibians use their lungs to breathe on land, but also draw oxygen in through their skin. In order for this process to work properly, the skin of most amphibians must be kept moist. A word of caution here: When you handle frogs and salamanders, be sure to keep the animals moist, so that their skin doesn't dry out! Otherwise, it would be hard for them to get the oxygen they need. In order to stay wet, amphibians will hop into water or crawl beneath a moist log. Most frogs, toads, and salamanders molt, or **shed** their skins, often eating their own skins for extra nutrients once they are shed.



11 [Pause for students to share.]
(They may or may not say "earthworms.")

← **Show image 5A-7: Caecilian**

The third and smallest group of amphibians lives deep underground. Look at this picture and see if you recognize them. What do you see? ¹¹ They do look like earthworms, don't they? But earthworms are not amphibians. Rather, these tube-like creatures, not nearly as common as earthworms, belong to the group of amphibians known as caecilians [sih-SILL-yuhns], or slowworms. They look a bit like other amphibians, only without legs! They need very wet conditions and live in tropical, or warm, climates only. These interesting animals range in size from only about five *inches* to more than five *feet* long! They have very sharp teeth and large jaws. And guess what? Caecilians have two lungs! These legless pattern-breakers live most of their lives underground, coming up only occasionally to feed.



12 Fossils are preserved bodies or imprints of a plant or animal from long, long ago.



← **Show image 5A-8: Fish, early amphibian, and fossil**

Most scientists generally agree that amphibians **evolved** from an early group of fish with lobed, or fleshy, fins hundreds of millions of years ago, long before the dinosaurs. Scientists continue to study fossil remains, trying to figure out the exact way in which this slow change occurred over a long period of time.¹²

← **Show image 5A-9: Crested Forest Toad**

Today, amphibians live everywhere on Earth except Antarctica. Because these cold-blooded vertebrates depend on moisture to live, many of them live in tropical rainforests or near rivers, lakes, and streams. Amphibians that live in cold climates become **dormant** as their bodies slow down in winter, burrowing deep underground or burying themselves in the top layer of mud at the bottom of ponds to stay warm. Dormant amphibians hibernate, living off stored energy, for months at a time.

Next time we meet, you will learn all about the way scientists classify snakes like Anna Anaconda. I'll give you a hint. Remember when I said that salamanders are often mistaken for lizards, but that lizards belong to a different group of animals? Well, Anna belongs to the same group as lizards. Does anyone want to predict the name of that group?¹³ Wait and see if you're right. For now, I want to congratulate you all on being such good sleuths, or detectives! Any taxonomist would love to have your help in classifying Earth's animals. See you soon!

13 [Pause for students to share.]

Comprehension Questions

15 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** For written responses in this domain, students will use their Classification Journals to collect source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

Note: Fill in the Classification Chart where appropriate as you move through the comprehension questions. If students bring up a pattern-breaker in their responses, be sure to include that in the appropriate column.

1. *Evaluative* Were your predictions correct about how amphibians and fish are similar or different? Why or why not? (Answers may vary, but should include the following: amphibians live partially on land and partially in the water; many amphibians begin life underwater and as they grow they live mostly on land; etc.) **How are amphibians and fish alike? How are they different?** (both begin life underwater, breathe using gills, reproduce by laying eggs, and are cold-blooded vertebrates; amphibians live on land and in water, whereas fish live entirely in water; amphibians' gills develop into lungs)
2. *Evaluative* What do we mean when we say amphibians morph? (They change or transform from one stage of life to the next.) In what longer word can the shortened word *morph* be found? (*metamorphosis*) Do you think it is likely that an amphibian would shed its skin when it is going through metamorphosis? Why? (Yes, as amphibians are going through this period of change, they shed their skins so they can grow.)
3. *Inferential* In the read-aloud, you heard that an amphibian's body temperature fluctuates. What does this mean? (It shifts back and forth.) Knowing that their temperatures fluctuate, what does that tell you about whether amphibians are cold-blooded or warm-blooded animals? (They are cold-blooded because their body temperatures are not constant—they shift depending on the surroundings.)

4. *Literal* After toads become adults and live on dry land, why do they go back to the wetlands every spring? (to lay eggs)
5. *Inferential* In the read-aloud, you heard that in places that get very cold, some amphibians bury themselves underground, and become dormant. What is meant by the word *dormant*? (existing in a state of rest or inactivity) Why is this important for these animals? (It helps them keep from freezing or drying out.)
6. *Inferential* In the read-aloud today, you learned that a tadpole, a type of baby amphibian, breathes through gills like fish because it lives primarily underwater. How do adult frogs breathe? (with lungs and through their skin)
7. *Inferential* What do we mean when we say that scientists study fossils to learn more about how amphibians may have evolved? (They are trying to learn how the animals may have changed slowly over a very long period of time.)



← **Show image 5A-9: Crested Forest Toad**

8.  *Evaluative* [Have students use their Classification Journals to answer this question.] Write two or three complete sentences that identify the major characteristics of amphibians. (Amphibians are cold-blooded; they live in and out of water; they lay eggs; etc.) [You may choose a current grammar skill that students are learning in the Skills strand and have them practice that skill while writing their sentences.]

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

9.  *Evaluative* *Think Pair Share:* As background information before the read-aloud, you learned that the word *amphibian* means “living two lives” or “two worlds.” Describe the transformation amphibians go through in their lifetimes. Be sure to discuss the first part of life and what makes it so different from the second part of life. (The first part of life is when the egg hatches and a tadpole is born—this is the larvae stage. Then the tadpole morphs and begins to enter the second part of life. Its gills slowly become lungs, and its tail slowly grows into legs. It has now transformed from a water animal to a land animal.)

10. After hearing today’s read-aloud and comprehension questions and answers, do you have any remaining questions?

➤ You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Shed

5 minutes

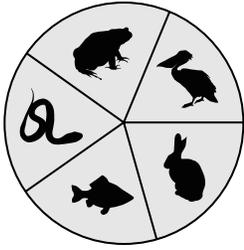
1. In the read-aloud you heard, “Most frogs, toads, and salamanders molt, or *shed* their skins, often eating their own skins for extra nutrients . . .”
2. Say the word *shed* with me.
3. *Shed* means to drop, cast off, or separate from something.
4. If you shed your rain jacket, you are taking it off. When an animal sheds its skin, the skin peels away from its body.
5. Have you ever shed something, or witnessed an animal that shed something? What was it? If not, can you imagine something that might be shed in the future? Be sure to use the word *shed* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I have shed . . .”]
6. What’s the word we’ve been talking about? What part of speech is the word *shed*?

Use a *Making Choices* activity for follow-up. Directions: I am going to name some actions. If what I name is an example of something being *shed*, say, “That is something being shed.” If what I name is not an example of something being shed, remain silent.

1. taking off your jacket, scarf, and sweater (That is something being shed.)
2. putting your toys away
3. putting on a hat
4. fur falling from a dog (That is something being shed.)
5. a snake skin dropping off (That is something being shed.)



Complete Remainder of the Lesson Later in the Day



Amphibians: From Water to Land

5_B

Extensions

20 minutes

Raise Your Hand If . . .

Tell students that they are going to complete a warm-up activity before they complete their brainstorming session about amphibians. Explain that you will begin with the phrase, “Raise your hand if,” and then you will add a second phrase about the characteristics of amphibians. Tell students to raise their hands if the statement is a true statement regarding the classification of amphibians. Clarify that for this warm-up, the characteristics discussed will describe the majority of the animals in this group, and that pattern-breakers will not be included. Also tell students that they may refer to the Classification Chart for information as needed.

1. Fish are amphibians.
2. Toads are amphibians. (Raise hands.)
3. Amphibians breathe through their skin. (Raise hands.)
4. Amphibians are invertebrates.
5. Amphibians are cold-blooded. (Raise hands.)
6. Amphibians go through a transformation called metamorphosis. (Raise hands.)
7. The word *amphibian* means living two lives. (Raise hands.)

Brainstorming About Amphibians (Instructional Master 5B-1; 1B-1, optional)

Using the Classification Chart on display in the room and Instructional Master 5B-1, students will gather information as reinforcement and also as notes for the formal paragraph assignment they will write later in this domain.

As they did in Lesson 4, students will write the name of the vertebrate animal group they have learned about today in the central oval of the instructional master. (amphibians) Then, in each of the surrounding ovals, students will write words and/or phrases that describe the characteristics

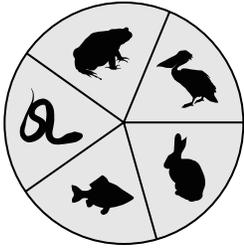
of animals in that group. They should also include in one of the surrounding ovals examples of animals in this group based on what they heard in the read-aloud today.

In the central oval and/or on the back of the worksheet, have students illustrate an animal they learned about today.

Tell students they will refer back to these Brainstorming Graphic Organizers when it comes time to write their paragraphs—that these ideas will be their notes/research at that time.

Note: You may guide students through this activity as a whole group, place them into small groups, or have them work with partners as you see fit.

➤ You may wish to have some students fill out Instructional Master 1B-1 independently along with 5B-1.



Pausing Point 1

PP₁

Note to Teacher

Your students have now heard the first five read-alouds of the *Classification of Animals* domain. It is highly recommended that you pause here and spend two days reviewing, reinforcing, or extending the material taught thus far.

You may have students do any combination of the activities listed below. The activities may be done in any order. You may wish to do one activity on successive days. You may also choose to do an activity with the whole class or with a small group of students who would benefit from the particular activity.

Core Content Up to This Pausing Point

Students will:

- ✓ Observe and describe basic characteristics of an animal
- ✓ Explain that scientists classify animals by common or shared characteristics
- ✓ Explain that scientists classify animals in order to study them and show relationships
- ✓ Identify cold-blooded/warm-blooded and vertebrate/invertebrate as important characteristics used to classify animals
- ✓ Describe basic characteristics of vertebrate/invertebrate animals
- ✓ Classify particular animals as vertebrates or invertebrates
- ✓ Describe basic characteristics of cold-blooded/warm-blooded animals
- ✓ Classify particular animals as cold-blooded or warm-blooded
- ✓ Identify fish, amphibians, reptiles, birds, and mammals as groups of vertebrates
- ✓ Identify basic characteristics of fish and amphibians
- ✓ Classify particular animals as fish or amphibians
- ✓ Compare and contrast two groups of vertebrates

- ✓ Identify insects as invertebrates
- ✓ Identify insects as the most numerous group of animals that have currently been identified
- ✓ Explain that there are a large number of animals that have not yet been identified
- ✓ Demonstrate familiarity with the poem “The Crocodile”

Activities

Image Review

Show the images from any read-aloud again, and have students retell the read-aloud using the images.

Image Card Review

Materials: Image Cards 1–6, 9, 10, 12, 13

In your hand, hold the Image Cards fanned out like a deck of cards. Ask a student to choose a card but to not show it to anyone else in the class. The student must then perform an action or give a clue about the picture s/he is holding. For example, for a fish, the student may give a clue like, “I am an aquatic creature that has gills and lives in water.” The rest of the class will guess what is being described. Proceed to another card when the correct answer has been given.



Domain-Related Trade Book or Student Choice

Materials: Trade book

Read an additional trade book to review a particular concept; refer to the books listed in the domain introduction. You may also choose to have students select a read-aloud to be heard again.

If students listen to a read-aloud a second time, you may wish to have them take notes about a particular topic. Be sure to guide them in this important method of gathering information. You may wish to model how to actively listen and take notes by doing the following activity with students:

- In preparation for this activity, pick out two or three core vocabulary words from the read-aloud you plan to reread, and write these words on chartpaper, a chalkboard or a whiteboard.
- Begin by asking a few volunteers to share what they would say the main ideas are regarding the read-aloud you are about to reread. This discussion is meant as review and warm-up for active listening. Point out the core vocabulary words you have chosen, and have students read them together chorally. Tell students that as you are rereading, they should be carefully listening, especially when you get to one of the words on the board. Then tell them that as you read, they will be jotting down notes—words or short phrases that best express the big idea. Be sure to tell them that they should not be writing in complete

sentences. As you read, you may want to slow down or even pause after reading the Guided Listening Supports that follow the core vocabulary words you have chosen.

- When you are finished rereading the read-aloud, have a few volunteers share one or two notes they have taken. Be sure to give feedback to help shape effective notes, and allow students to record any modifications you guide them through.

Now have students explain in two or three sentences the main ideas of this read-aloud, using the three core vocabulary words in their sentences.

Key Vocabulary Brainstorming

Materials: Chart paper, chalkboard, or whiteboard

Give students a key domain concept or vocabulary word such as *classification*. Have them brainstorm everything that comes to mind when they hear the word, such as *warm-blooded/cold-blooded, vertebrate/invertebrate, animal group, characteristics, features*, etc. Record students' responses on a piece of chart paper, a chalkboard, or a whiteboard for reference.

Multiple Meaning Word Activity: Column

Materials: Classification Chart; chart paper, chalkboard, or whiteboard; newspaper or magazine; drawing paper, drawing tools; various images portraying the meanings of column

Display the following definitions of the word *column* on chart paper, a chalkboard, or a whiteboard. Read each definition to students. You may also wish to display images and/or example sentences to convey the various definitions.

- “A”—a tall narrow stack of objects (a stack of vertebrae, rocks, or other objects)
- “B”—a pillar or column that is part of a structure (columns on a building or bridge)
- “C”—a column-like object (smoke or water)
- “D”—columns in a chart (showing the vertical columns of a chart)
- “E”—a vertical list of data (list of numbers or names)
- “F”—columns of text (newspaper or magazine)

Students may refer to the letters in their answers, name the example, or walk up to the definition/image and point to the example that shows the use of the word you are describing.

1. Sometimes, the word *column* is used to describe something that is tall and narrow and resembles a column, or pillar. A column of water or a column of smoke—these are two examples with which you may be familiar. Which definition/image shows this definition of column? (C)
2. Column can also mean other things as a noun, like a pillar on the front of a large building or a column supporting a tall bridge. Which definition/image matches this description of column? (B) What kind of building material are these types of columns often made from?
3. Sometimes, vertical information is not in a chart, but in a list or math problem. We might call this a column of numbers or names. When adding or subtracting, you need to be sure to line up your numbers in straight columns. What else might someone make a column, or list, of? Which definition/image shows this kind of use of the word column? (E)
4. In Lesson 3 you heard, “[The egret’s] backbone, or spinal column, helps it to hold its head up high and protects its spinal cord.” The egret’s spinal column, like that of a human’s, is a tall narrow stack of vertebrae. Who remembers what vertebrae are? Which definition/image of column matches the way column is used in the lesson? (A)
5. You may have heard yet another use of the word *column*, referring to the words in a newspaper or magazine. The words are arranged in vertical or up-and-down columns of text. [Show an example of a newspaper or magazine column.] How many columns of words or text are there in this example? Ask students if they have ever seen a special feature column in the newspaper. A column is sometimes a movie review or an advice column or an article about a special topic like “The Night Sky.” Ask students to share ideas of other topics that might be featured in a special newspaper column. (F)
6. In addition, a column can be an up-and-down part of a chart of information. [Point to a vertical column on the Classification Chart.] We call this vertical or upright section of the chart a column. A section going across the chart is called a row. [Point to a horizontal row on the Classification Chart.] Which definition/image matches this use of the word *column*? (D)

7. Now with your neighbor, quiz each other on the different meanings of the word *column*. Think of a sentence that uses the word *column*. Remember to be as descriptive as possible, and use complete sentences. For example, you could say, “When I was on a hike in the park, I saw that someone had made a tall column of small rocks.” And your neighbor should respond, “That’s ‘A.’”
8. Extension: Have students work with a partner to find and cut out pictures showing different kinds of columns and make a poster or collage using the images. Students may also illustrate their own images.

Poetry Writing

Using the poem “The Crocodile” as a model, have students create their own poems about an animal or animal group.

Research Activity: Learning More about the Real Animals

Materials: Image Cards 1–6, 9, 10, 12, and 13 ; Internet access; trade books; drawing paper, drawing tools

Give students the opportunity to research the following animal species that are displayed on the image cards. Y

Refer to the list of trade books and websites in the introduction as sources. Encourage students to write about or make a poster displaying what they learn. Have students present their findings to a group or with the class.

- Red-Bellied Piranha
- Crested Forest Toad
- Green Anaconda
- Great White Egret
- Common Hippopotamus
- Gentoo Penguin
- Brown Trout
- African Elephant
- Australian Saltwater Crocodile

If your students have already heard the *Classic Tales: The Wind in the Willows* domain, you may wish to connect back to the real animals represented in that story now that students have learned more about

classifying animals by their characteristics. Students may research the classification, habitats, habits, diets, and other characteristics of rats, moles, toads, badgers, otters, stoats, ferrets, and weasels.

Collaborative Drawing

Materials: Classification Chart; drawing paper, drawing tools

Note: This activity works well as a small-group activity while students are working independently on research. You may need to assist students with passing the drawing paper so that each drawing remains face-down. You may wish to post the completed drawings on your classroom bulletin board.

In advance, fold sheets of drawing paper into thirds. Students will be working in groups of three. Tell students they will be drawing animals from the read-aloud. Tell students they may refer to image 1A-10 and the Classification Chart to help them with ideas, and that they may choose an animal group that has not yet been entered in detail on the Classification Chart. The most important direction for this activity is that students may not tell the other members of their group what they are drawing. They must include characteristics of the animal group they are choosing. For instance, if someone chooses an animal in the fish group, the drawing would need to include scales and gills. The first student in each trio will have the assignment of drawing the head of any animal that is classified in one of the five vertebrate animal groups, and s/he will use just the first folded third of the paper.

When this is complete, the first student will pass the drawing to the second student, being sure to keep the head of the animal face down. The second student in each trio will draw the middle section of a body of an animal of his/her choosing that is classified in one of the five vertebrate groups. The second student will use the middle third of the piece of paper. Tell students that this is not intended to be the same animal that the first student has drawn, and remind them that there is to be no discussion of what anyone draws. When the second student is finished, s/he will pass the drawing to the third student. The third student in each trio will draw the lower half of an animal's body (e.g., legs, tail, etc.) on the lower third of the drawing paper.

After the third student in each trio has completed the final part, students may open up the folded paper to see what they have created!

Last, each trio will collaborate to come up with a fitting name for the animal they have created.



How Would You Classify These Objects?

Materials: Classification Journals; variety of objects

Show students a set of four to six simple, familiar objects that have a variety of characteristics, some characteristics that are similar and some that distinguish them, e.g., a plastic-handled pair of child’s scissors, a butter knife, a green leaf, a red push pin, a green piece of paper, and a safety pin.

Ask students to observe the characteristics of the objects and compare and contrast them: “How are these objects similar? In what ways do they differ?” (Answers may vary.) Ask: “If you had to divide these four objects into two categories, what categories would you choose and which objects would be in each one? Why did you choose your categories?” (Answers may vary and may include things like the following: one material/multiple materials; flat/pointed; metal/not metal; sharp/dull.) If time allows, have students share their ideas. You may wish to discuss that there are many ways these objects could be classified, and that there is not necessarily a right way or a best way as long as each object fits into one of the categories chosen. If the idea arises, share with students that a third category could be added to the pair of characteristics for some objects. As time allows, you may wish to have students write about their observations in their Classification Journals.

You may also wish to have students sort everyday objects that are already in the classroom, such as book bags, backpacks, shoulder bags, bags with wheels or without, etc. Discuss how classification makes things easier to find, identify, and study. Ask students what else in the room can be classified in various ways.

Vertebrates

Materials: Bone models; bone images

Show students bone models or pictures of the skeletons of humans and other animals to illustrate the term *vertebrate*. You may wish to also review the word *vertebrae* as the name for the bones that make up the backbone of vertebrates. Help students find the backbone (*vertebrae*) in each model/image and to feel their own *vertebrae*.

Making a Poster

Materials: Poster 2 (All My Best Friends Represent Vertebrates); drawing paper, drawing tools

Using Poster 2 and the mnemonic as reference, have students create posters of their own which name the five vertebrate animal groups. Be sure to have them include the name of each group along with a drawing of an animal in each group.

Classroom Fish

Materials: Fish tank; aged tap water; small fish; fish food; turkey baster or air pump

You may wish to prepare a tank as an aquarium so that students may closely study fish. Age tap water by letting it sit out for twenty-four hours. Add in goldfish or other small fish from a pet store. If there is no air pump in the tank, squeeze a turkey baster into the water a few times every couple of days to oxygenate the water for the fish. Add fish food as directed on the package. Allow students to study and take notes on the fish. Be sure to point out key characteristics such as gills, fins, and scales.

Animal Groups Bulletin Board

Materials: Bulletin board; drawing paper, drawing tools; magazines

Tell the class or a group of students that together they are going to make an Animal Groups bulletin board to help them remember what they have learned thus far in this domain. Have students brainstorm important information about the groups of animals they have learned. Have each student choose one idea to draw a picture of, and ask him or her to write a caption for the picture.

Divide the bulletin board into five sections, one section for each animal group. Post students' drawings in the categories they describe. (Cold-blooded would go in the Fish, Amphibians, or Reptiles section, for example.) You may want to have more than one student draw/write about each concept.

Then, have students bring in images or cut out images of animals from each of the groups and post those onto the bulletin board as well. Tell students that they will continue to add to this bulletin board as they learn more about animal groups.

Frog Metamorphosis

Materials: Tadpoles; aquarium; rocks; branches

If possible, collect tadpoles from a local body of water, or order them from a science catalog, in order to allow students an opportunity to examine and observe the tadpoles' metamorphosis into adult frogs. Check a field guide on amphibians to find frogs native to your region before ordering from a science provider.

Prepare an aquarium with water. Add rocks or branches that protrude above the surface of the water so the tadpoles have something to climb onto as they develop into frogs. Be sure to have a tight-fitting, but permeable cover to prevent maturing frogs from jumping out of the tank.

Allow students to study and take notes on the frogs as they develop.

Note: If you collected tadpoles locally, return the adult frogs to the same area. If you cannot use native species, you may not choose to complete this activity, because you will not have a place to release the frogs once they have matured.

10 Riddles for Core Content

Ask students riddles such as the following to review core content:

- I am a process of organizing animal groups based on particular characteristics. What am I called? (animal classification or taxonomy)
- I am a person with a high level of knowledge about the natural world based on facts learned through observation and experiments. I classify animals into groups according to their characteristics. What am I? (a taxonomist)
- I am an animal whose body temperature is maintained by my surroundings. It is not constant. What am I? (a cold-blooded animal)
- I am an animal whose body temperature is a constant temperature and does not depend on the temperature of my surroundings. What am I? (a warm-blooded animal)
- I am an animal with a backbone. What am I? (a vertebrate)
- I am an animal without a backbone. What am I? (an invertebrate)
- I am an aquatic animal with gills and fins, and I have a body covered in scales. What am I? (a fish)
- I am an animal that can live both on land and in water. What am I? (an

amphibian)

- I am the larva that hatches from the egg of an adult female frog. What am I? (a tadpole)
- I am the process by which some young animals develop and drastically change from their infant forms into their adult forms. What am I called? (metamorphosis)



Venn Diagram

Materials: Instructional Master PP1-1; chart paper, chalkboard, or whiteboard

Tell students that together you are going to compare and contrast two things or animals students have learned about by asking how they are similar and how they are different. Use Instructional Master PP1-1 to list two items or animals at the top of the diagram and to capture information provided by students. Choose from the following list or create a pair of your own:

- vertebrates and invertebrates
- warm-blooded and cold-blooded
- organisms and objects
- plant kingdom and animal kingdom
- fish and amphibians
- toads and frogs

You may wish to create several copies of the Venn diagram to compare and contrast several things or animals. You may also wish to have students use these diagrams as brainstorming information for further writing.

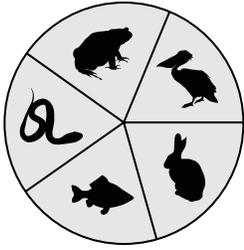
- You may wish to have some students use Instructional Master PP1-1 to complete this activity independently.
- You may wish to have some students create a three-way Venn diagram to compare and contrast three things or animals, e.g., carnivores, omnivores, and herbivores; amphibians, reptiles, and birds; etc.



Writing Prompts

Students may be given an additional writing prompt such as the following:

- I know that I am warm-blooded because . . .
- Scientists classify animals because . . .
- Warm-blooded animals are . . .
- Cold-blooded animals are . . .
- Two interesting facts I learned about animals are . . .
- Compare and contrast a piranha and a toad.
- Compare and contrast vertebrates and invertebrates.
- Choose an animal that is a pattern-breaker, and write a paragraph explaining why it should be classified differently than it is.



Reptiles: Cold-Blooded Scaly Vertebrates

6

✔ Lesson Objectives

Core Content Objectives

Students will:

- ✓ Observe and describe basic characteristics of an animal
- ✓ Explain that scientists classify animals by common or shared characteristics
- ✓ Explain that scientists classify animals in order to study them and show relationships
- ✓ Classify particular animals as vertebrates or invertebrates
- ✓ Classify particular animals as cold-blooded or warm-blooded
- ✓ Identify basic characteristics of reptiles
- ✓ Classify particular animals as reptiles
- ✓ Compare and contrast two groups of vertebrates

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Reptiles: Cold-Blooded Scaly Vertebrates” (RI.3.7)
- ✓ Interpret information about animal characteristics and their classifications from diagrams, charts, graphs, and graphic organizers (RI.3.7)
- ✓ Compare and contrast the characteristics of a salamander and a lizard, and of a crocodile and alligator, in “Reptiles: Cold-Blooded Scaly Vertebrates” (RI.3.9)

- ✓ Make personal connections to the experience of being a herpetologist in “Reptiles: Cold-Blooded Scaly Vertebrates” (W.3.8)
- ✓ Gather information about reptiles from the text and images of “Reptiles: Cold-Blooded Scaly Vertebrates”; take brief notes and sort evidence into provided categories (W.3.8)
- ✓ Classify and organize the characteristics of reptiles (W.3.8)
- ✓ Summarize (orally and in writing) information about the characteristics and classification of reptiles (SL.3.4)
- ✓ Choose words and phrases to effectively describe the characteristics of reptiles (L.3.3a)
- ✓ Determine the meaning of the new word formed when a known affix is added to a known word, such as *-ology/ologist* and *herpetology/herpetologist* (L.3.4b)
- ✓ Use a known root word as a clue to the meaning of an unknown word with the same root, such as *reptile/reptilia* and *morph/metamorphosis* (L.3.4c)
- ✓ Draw illustrations to represent the characteristics of reptiles from “Reptiles: Cold-Blooded Scaly Vertebrates”

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

aggressive, *adj.* When something is forceful or overbearing

Example: The soccer goalie made such an aggressive throw from the goal line that the ball almost reached the goal on the other side of the field.

Variation(s): none

calcified, *adj.* Hardened, especially by deposits of the mineral known as calcium salts

Example: The archaeologist dug up a calcified shell that had been buried in the soil for thousands of years.

Variation(s): none

domed, *adj.* Rounded like half of a sphere

Example: The domed ceiling of the planetarium gave us the feeling of looking up at the night sky.

Variation(s): none

effectively, *adv.* Fully fit to accomplish a purpose successfully

Example: In order for Wanda to tie her shoes effectively, she needed to pull the hair back that was hanging down in front of her eyes.

Variation(s): none

membranes, *n.* Thin, flexible layers of tissue serving as a protective covering or lining

Example: The membranes of the eggs got all scrambled up with the yolks and egg whites when Kai began making batter for pancakes on Sunday morning.

Variation(s): membrane

sensitive, *adj.* Able to feel something very quickly or intensely

Example: Because a reptile's skin is sensitive to temperature, it will become hot or cold very quickly if it sits in the shade or in the sun.

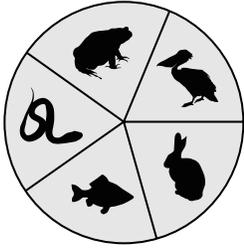
Variation(s): none

venomous, *adj.* Having or producing poisonous fluid

Example: The nurse could see right away from the many scratch-like teeth marks that the snake that had bitten Katya was not venomous.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	Classification Chart	10
	Observation and Inquiry	Image Cards 15 and 16	
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Reptiles: Cold-Blooded Scaly Vertebrates	world map or globe	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	Classification Chart; Classification Journals; index cards	15
	Word Work: Effectively		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Brainstorming About Reptiles	Classification Chart; Instructional Master 6B-1; Instructional Master 1B-1 (optional)	20



Reptiles: Cold-Blooded Scaly Vertebrates

6A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Show students Image 5A-9, and remind them that in the previous lesson they learned more about a specific group of animals. Ask for a volunteer to identify the animal in the image. Then ask if they remember the name of this group. (amphibians) Ask students to explain how they know that a toad is an amphibian. Review with students the Classification Chart from previous lessons, looking specifically at amphibians and their characteristics. Ask, “What is unique about amphibians?” (They live in two different worlds during their lifetime. They begin as tadpoles with gills, living and breathing in water, but they slowly develop lungs and live on land, breathing air through their lungs and skin.) Be sure to review with students that most amphibians reproduce by laying eggs in water and have slimy skin that helps them breathe.

Observation and Inquiry

Show students Image Cards 15 (Salamander) and 16 (Lizard). Ask students to make observations about the characteristics of these two animals. Ask them how they are similar and how they are different. (Similarities might include four legs, body shape, and tails; differences might include color, skin covering, and moisture of skin.) Ask students if they remember whether or not salamanders and lizards belong to the same animal group.

Purpose for Listening

Tell students to listen to the read-aloud for characteristics that taxonomists use to classify salamanders and lizards differently.



Reptiles: Cold-Blooded Scaly Vertebrates

← Show image 6A-1: Rainforest with piranha, toad, and Anna Anaconda

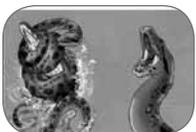
Hello, boys and girls. As you can see, Anna Anaconda is our starting place for today's lesson. She is a green anaconda, one of the largest snakes in the world. When she unwinds, she is about as long as six of you stretched head-to-toe across the room, and she weighs about five hundred pounds! That's more than about eight of you put together!¹

1 Let's say the name together of the kind of snake Anna is: anaconda!

2 [Pause for students to share.]

Anna Anaconda belongs to a group of animals that shares a lot of the same characteristics as the amphibians you learned about last time. Who knows the name of the group used by taxonomists to classify snakes?² Yes, snakes are reptiles. Reptiles include crocodiles, alligators, lizards, turtles, and tortoises. But right now I want to focus on one reptile only: Anna. It's no secret that she has a very high opinion of herself—she was quite fond of telling me so when I visited Peru. She thinks she is rather pretty, and I quite agree!

In spite of her heavy body, Anna is a very good swimmer. Unlike some of her reptilian relatives, she is an aquatic snake, preferring swamps and rivers to the land.



← Show image 6A-2: Anaconda teeth and constricting

Snakes often have a bad reputation. Some snakes are poisonous, releasing poisonous liquid called venom when they bite. Anna's teeth are actually quite small and she is not **venomous**, so you need not worry about that. However, some people fear anacondas because they are members of a family of snakes called constrictors. Does anyone know what that means?³ Constrictors catch and kill their prey by coiling, or wrapping, around to prey and squeezing them very tightly. Anacondas' jaws open so wide that they can swallow animals whole—fish, caiman,⁴ even jaguars and small deer. The anaconda's powerful muscles crush the bones of its prey as it constricts. Once swallowed, the anaconda slowly digests its meal.

3 [Pause for students to share.]

4 or small crocodile-like animals

5 [Have a volunteer point to South America on a world map or globe.]



6 *Reptilia* is Latin for *reptiles*, just as *animalia* is Latin for *animals*.

7 Who remembers how toads and salamanders breathe?

Uh oh, some of you look fearful. Don't worry. You're safe. Anacondas don't live where you live in North America; you'll find them far, far away on the continent of South America.⁵ That's where I met Anna! Anna was sure to tell me that as far as she knows, there is no documented record of an anaconda ever killing a man, woman, or child. She and all anacondas are nocturnal animals and they hunt at night, eating frogs, toads, birds, fish, and turtles. She doesn't have to hunt very often because one animal will satisfy her appetite for a long time.

← **Show image 6A-3: Anaconda in its habitat**

Well, that's a lot of information about Anna's characteristics, the ways by which scientists classify her as belonging to the animal class called reptiles, or reptilia.⁶ Anna and other reptiles share some common characteristics with amphibians. Many scientists believe reptiles evolved from amphibians. Reptiles are all vertebrates because they all have backbones, and they are all cold-blooded because their internal temperatures change with their surroundings. Most reptiles can adjust their body temperatures by basking in the sun to stay warm, or by hiding under a rock to stay cool.

Just like amphibians, reptiles live on land and in water. However, these two groups do—of course—have their differences. Amphibians depend upon water to stay alive much more so than reptiles.⁷ Amphibians' thin, wet, slimy skin needs moisture to absorb oxygen from the air, but reptiles' skin is waterproof. Unlike toads and salamanders, Anna and other reptiles do not breathe through their skin, which is hard, dry, and scaly. They use only their lungs to breathe air, which means they are able to withstand very harsh dry weather, conditions under which amphibians would not be able to survive. Of course, because they have lungs, this also means that reptiles cannot stay underwater very long without coming to the surface to breathe.



← **Show image 6A-4: Two geckos, chameleon, iguana, Komodo dragon**

Amphibians usually spend part of their lives entirely in water, but this is not true of reptiles as a group. Whereas amphibians begin life with gills, reptiles are born with lungs and are never dependent upon gills for breathing. Remember how different baby tadpoles look from adult toads? This is not the case for reptiles. Baby reptiles usually look a lot like their parents. They do not undergo metamorphosis the way that amphibians do.⁸

8 In the last read-aloud, we talked about the way certain animals like tadpoles morph as they grow older. Let's all say the word *metamorphosis* together. Raise your hand when we get to the syllable *morph*. Who can tell me what *metamorphosis* means?

9 Who can tell me what camouflage means? (to blend in with their surroundings)

Let's take a look at some of the animals that belong to the animal group classified as reptiles. These include lizards, geckos, iguanas, and chameleons. Unlike snakes, most lizards have four legs. Chameleons have a keen sense of sight and very long tongues. Their brilliant colors—all shades of pink, blue, red, orange, turquoise, and green—help them camouflage when they come face-to-face with their enemies.⁹

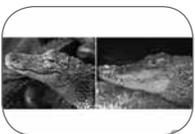
Earth's largest living lizard is the Komodo dragon. It can grow to be ten feet long and may weigh as much as 150 pounds! These giant island carnivores eat animals as large as goats, pigs, and deer.



← **Show image 6A-5: Crocodile**

Saltwater crocodiles are the largest reptiles on Earth, some weighing up to one ton.¹⁰ Looking like very large lizards, crocodiles make their homes in tropical climates, and are often seen floating like logs in the water with only their nostrils, eyes, and ears showing. Like Anna, they are nocturnal hunters, hunting at night. Crocodiles have the most powerful bite in the entire animal kingdom and are fierce hunters, living off fish and small mammals. Some live to be more than one hundred years old!

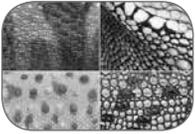
10 That's two thousand pounds! The weight of the average mid-sized car is about two tons.



← **Show image 6A-6: Alligator and crocodile**

Alligators resemble crocodiles, but they are usually less **aggressive**, or boldly forceful, and live in freshwater habitats. Can you tell the difference between an alligator and a crocodile?¹¹ Alligators usually have a wide, rounded, U-shaped snout, and crocodiles tend to have longer, more pointed, V-shaped noses.

11 [Pause for students to share.]



← **Show image 6A-7: Reptile scales**

Look at all of these reptiles side by side: chameleons, Komodo dragons, crocodiles, and alligators. What do you notice about their skin? Is it rough or smooth? Does it look thick or thin?

Remember when I mentioned that reptiles' skin is waterproof, and that it is hard, thick, and scaly? Their type of scaly skin protects them from overheating, and because their skin is waterproof, it keeps water *inside* their bodies. Because reptiles' skin is very **sensitive** to—or easily affected by—temperature, it becomes hot or cold very quickly when exposed to sun or shade. Like many amphibians, some reptiles shed their skin. Many lizards and snakes shed their skin several times a year as they grow. Snakes do not eat their shed skin the way amphibians do.

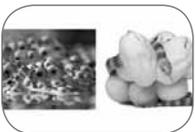


← **Show image 6A-8: Turtle and tortoise and their legs**

Turtles and tortoises are the only reptiles with bony shells as part of their skeletons. Their backbones are actually fused to their shells. These shells may be flat or **domed**. Turtles have softer shells so that they can swim faster, but land-dwelling tortoises need hard, leathery shells to protect them from predators. Their legs vary in appearance, depending upon where they live as well. Sea turtles have oar-shaped flippers for moving through water **effectively**. Many turtles have claws which help them dig, and pond turtles also have webs between their claws to effectively maneuver, or move, through water.¹² Land tortoises—like the giant Galapagos—have huge, column-shaped legs with claws. These claws help them dig into the ground to move across it. Some turtle species live for more than a century!¹³ That's a very long time indeed.

12 What other animals have you heard about that have a body design for swimming? (fish with their fins)

13 Who can tell me how many years are in a century? (one hundred)



← **Show image 6A-9: Frog and snake eggs**

Body coverings are an important difference between amphibians and reptiles. Another thing that sets the two groups apart is their eggs. Remember the slide that showed strands of thousands of soft eggs that Tabitha Toad laid in the pond? Most reptiles lay far fewer eggs, and they lay their eggs in nests on land. **Membranes**, soft outer coverings, that provide protection and also

help to hold in necessary water for eggs to grow, usually coat the inside of reptilian eggs. In most reptile species, the eggs are also covered in leathery, **calcified** shells. A few snakes and lizards give birth to fully formed, live young instead of laying eggs. The garter snake, a snake that is right here in North America, is one of these exceptions to the rule; so is the Solomon Island Skink, a lizard whose habitat is near the continent of Australia.

Like amphibians, reptiles live all over the world. They prefer hot, low areas like rainforests, prairies, deserts, and oceans, but they can be found everywhere except near the cold South Pole.



← **Show image 6A-10: Herpetologist**

14 You may have learned about many different *-ologists* in previous years—geologists, paleontologists, and archaeologists. Knowing that *-ology* means an area of study and *herpeton* means crawling animal, who can tell me what a herpetologist is?

If you are as fascinated as I am with reptiles and amphibians, you may want to think about becoming a herpetologist.¹⁴ Yes, indeed—*herpetologist* is the name given to a scientist who specializes in herpetology, the study of certain crawling animals, specifically, reptiles and amphibians. With more than 5,600 species of lizards alone, that should keep you busy for a lifetime!

15 [Pause for students to share.]

You have seen and learned a lot about fish, amphibians, and reptiles, but there are still two major groups of vertebrates for you to learn more about. Who remembers what they are?¹⁵ Yes, birds and mammals. Next time, I will be back to tell you all about Ebenezer Egret. Get ready to feast your eyes on a stunning variety of Ebenezer's feathered friends. Bye-bye for now!

Comprehension Questions

15 minutes

Note: Fill in the Classification Chart where appropriate as you move through the comprehension questions. If students bring up a pattern-breaker in their responses, be sure to include that in the appropriate column. The bottom row *Local Animals* will not be filled in until Lesson 9.

1. *Evaluative* What are the characteristics of a lizard that classify it as a reptile? (Young are born looking like parents; have hard, thick, scaled skin; lay eggs in a nest on land; breathe through lungs.) How is this different from the salamander, which is an amphibian? (Salamanders are born as tadpoles; are amphibians that first breathe through gills and then later through lungs and skin; have moist, slimy skin; lay eggs in water.)
2. *Inferential* What kind of a reptile is Anna? (anaconda) What did Rattenborough mean when he told us that anacondas are not venomous? (They are not poisonous; they do not have any venom.)
3. *Evaluative* In the read-aloud today you learned that reptiles have hard, scaly skin. How is this waterproof, scaly skin helpful to reptiles? (It keeps water in, keeps them from overheating, and protects them.) You also learned that reptiles' skin is sensitive. Explain what *sensitive* means and why it's especially important for a cold-blooded animal to have scaly, sensitive skin. (*Sensitive* means able to feel something quickly or intensely. It is important because reptiles, which are cold-blooded, depend on their skin for regulating body temperature.)
4. *Literal* Which two classes are the only ones in the entire group of known reptiles who have calcified, domed shells? (turtles, tortoises)
5.  *Evaluative* Describe the part of a pond turtle's body that helps it move through water effectively. (webbing between claws) Now compare and contrast the body design of a pond turtle to that of a fish. (Both are cold-blooded vertebrates, have scales, and swim in the water. A pond turtle, however, has webbed claws to help it swim, whereas a fish has fins and a tail for effective swimming. Also, a pond turtle has lungs and breathes air, whereas a fish has gills and breathes through water. Finally, a pond turtle has a domed shell, and fish do not.)



6. *Inferential* In the read-aloud, you heard that reptiles lay eggs in nests on land. Why is the membrane in the egg important? (It provides protection and holds in necessary water.)

← **Show image 6A-6: Crocodile and alligator**

7.  *Evaluative* Compare and contrast a crocodile and an alligator. (They are both reptiles; they both have hard, scaly skin; alligators prefer fresh water, and they have a wide, rounded, U-shaped snout; crocodiles prefer salt water and tend to have longer, more pointed, V-shaped noses.) What is one well-known fact that supports the claim that the crocodile is more aggressive? (The crocodile has the most powerful bite of all the animals in the animal kingdom.)
8.  *Inferential* What major characteristics represent animals in the group called reptiles? (cold-blooded, vertebrates, covered in scales or bony plates, usually lay eggs, have lungs)
9.  Do you think you might like to be a herpetologist some day? Why or why not? (Answers may vary.)
10.  *Evaluative* *What? Pair Share:* Asking questions after a read-aloud is one way to see how much everyone has learned. Think of a question you can ask your neighbor about reptiles that starts with the word *what*. For example, you could ask, “What is one characteristic of reptiles?” Turn to your neighbor and ask your “what” question. Your neighbor will listen very carefully and write your question on an index card. Then your neighbor will read your question back to you. Listen carefully to make sure the question was written just as you meant for it to be asked. Then your neighbor will ask a new “what” question, and you will get a chance to respond. I will call on several of you to share your questions with the class.
11. After hearing today’s read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Effectively

5 minutes

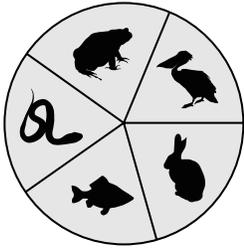
1. In the read-aloud you heard, “Sea turtles have oar-shaped flippers for moving through water *effectively*.”
2. Say the word *effectively* with me.
3. When something is accomplished effectively, it means that it is well done with purpose and success.
4. There was no way for the principal to effectively get his message to the entire school while the public address system was broken.
5. Think of a time when either you did something effectively or you observed something being done effectively. Be sure to use the word *effectively* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I carved the pumpkin more effectively with...”]
6. What’s the word we’ve been talking about? What part of speech is the word *effectively*?

Use a *Making Choices* activity for follow-up. Directions: I am going to ask you some questions about some things that you may be able to do effectively or that you may not be able to do effectively, or at all. Include the question in your answer, as well as the reason. For example, if I asked, “Can you drive a car effectively?” you might answer, “I don’t think I could drive a car effectively because I am too young, and I don’t know how!” (Answers may vary for all.)

1. Can you effectively draw a picture with markers?
2. Can you help a family member effectively unload the car?
3. Can you effectively launch a space rocket from your kitchen table?
4. Can you effectively organize your desk?
5. Can you effectively help plan a surprise party for someone you love?
6. Can you effectively juggle seven beanbags?



Complete Remainder of the Lesson Later in the Day



Reptiles: Cold-Blooded Scaly Vertebrates

6_B

Extensions

20 minutes

Brainstorming About Reptiles (Instructional Master 6B-1; 1B-1, optional)

Using the Classification Chart on display in the room and Instructional Master 6B-1, students will gather information as reinforcement and also as notes for the formal paragraph assignment they will write later in this domain.

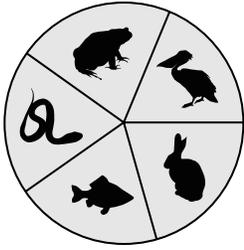
On Instructional Master 6B-1, students will write the name of the vertebrate animal group they have learned about today in the central oval. (reptiles) Then, in each of the surrounding ovals, students will write words and/or phrases that describe the characteristics of animals in that group. They should also include in one of the surrounding ovals examples of animals in this group based on what they heard in the read-aloud today.

In the central oval and/or on the back of the worksheet, have students illustrate an animal they learned about today.

Tell students they will refer back to these Brainstorming Graphic Organizers when it comes time to write their paragraphs—that these ideas will be their notes/research at that time.

Note: You may guide students through this activity as a whole group, place them into small groups, or have them work with partners as you see fit.

- You may wish to have some students fill out Instructional Master 1B-1 independently along with 6B-1.



Birds: Wings and Feathers

7

✔ Lesson Objectives

Core Content Objectives

Students will:

- ✓ Observe and describe basic characteristics of an animal
- ✓ Explain that scientists classify animals by common or shared characteristics
- ✓ Explain that scientists classify animals in order to study them and show relationships
- ✓ Classify particular animals as vertebrates or invertebrates
- ✓ Classify particular animals as cold-blooded or warm-blooded
- ✓ Identify fish, amphibians, reptiles, and birds as groups of vertebrates
- ✓ Identify basic characteristics of birds
- ✓ Classify particular animals as birds
- ✓ Compare and contrast two groups of vertebrates

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Determine the main ideas of “Birds: Wings and Feathers”; recount the key details and explain how they support the main ideas (RI.3.2)
- ✓ Determine the literal and nonliteral meanings of and appropriately use common sayings and phrases, such as “eats like a bird” (RI.3.4) (L.3.5a)
- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Birds: Wings and Feathers” (RI.3.7)

- ✓ Interpret information about animal characteristics and their classifications from diagrams, charts, graphs, and graphic organizers (RI.3.7)
- ✓ Compare and contrast the characteristics of an eagle and hummingbird; and of a penguin and a bird that can fly, as well as a fish, and their relative classifications in “Birds: Wings and Feathers” (RI.3.9)
- ✓ Conduct short research projects that build knowledge about the characteristics and classification of birds (W.3.7)
- ✓ Make personal connections to the experience of observing birds in everyday life in “Birds: Wings and Feathers” (W.3.8)
- ✓ Gather information about birds from “Birds: Wings and Feathers” by hearing the read-aloud and viewing the images again; take brief notes and sort evidence into provided categories (W.3.8)
- ✓ Classify and organize the characteristics of fish (W.3.8)
- ✓ Summarize (orally and in writing) information about the characteristics and classification of birds (SL.3.4)
- ✓ Choose words and phrases to effectively describe the characteristics of birds (L.3.3a)
- ✓ Draw illustrations to represent the characteristics of birds from “Birds: Wings and Feathers”

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

cavities, n. A hollow space within a body, a bone, or an organ

Example: Before we set the turkeys in the ovens to roast, we filled their empty cavities with stuffing.

Variation(s): cavity

glide, v. To move smoothly and continuously

Example: Shiho loved the winter time when the pond froze; she especially liked to glide across the ice on her ice skates.

Variation(s): glides, glided, gliding

insulation, n. Material that separates an area in order to keep in a form of energy

Example: Adult seals have a thick layer of blubber that serves as insulation which helps to keep them warm in colder waters.

Variation(s): none

metabolism, n. The process in living animals whereby cells are built up and broken down

Example: My aunt says that I must have a high metabolism because in the short time it takes her to clean up the breakfast dishes, I am hungry again and ready for lunch.

Variation(s): metabolisms

nest, n. A structure formed and used by animals for laying and hatching eggs

Example: A wren built her nest on our windowsill, so we had a rare opportunity to quietly watch when the eggs hatched.

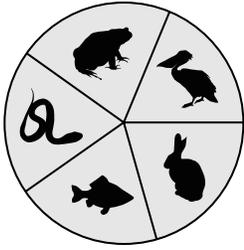
Variation(s): nests

webbed, adj. Having a layer of skin that connects the fingers and/or toes

Example: The webbed feet of the frog help it to swim quickly through the water.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
Introducing the Read-Aloud	What Have We Already Learned?	Poster 2 (All My Best Friends Represent Vertebrates!); Classification Chart	10
	What Do We Know?	Classification Journals; index cards	
	Purpose for Listening		
Presenting the Read-Aloud	Birds: Wings and Feathers	Image Card 17; world map or globe	20
Discussing the Read-Aloud	Comprehension Questions	Classification Chart; Classification Journals	15
	Word Work: Metabolism		5
 Complete Remainder of the Lesson Later in the Day			
Extensions	Brainstorming About Birds	Classification Chart Instructional Master 7B-1 Instructional Master 1B-1, optional	20
	Summarizing the Main Ideas of the Read-Aloud	Classification Chart Instructional Master 7B-1 chart paper, chalkboard, or whiteboard	



Birds: Wings and Feathers

7A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Ask students, “What have you been learning about?” Remind students that they have been learning about the classification of animals. Ask, “How do scientists classify animals?” Show students Poster 2 (**All My Best Friends Represent Vertebrates!**). Now ask students to say out loud with you the mnemonic: “**All My Best Friends Represent Vertebrates.**” Have students turn to a partner and take turns naming the five groups of animals: amphibians, mammals, birds, fish, and reptiles. Point to the Classification Chart on display and ask, “What types of characteristics do scientists use to classify animals into these groups?” Review the terms *cold-blooded/warm-blooded* and *vertebrate/invertebrate* as needed. Ask the following riddles:

- I breathe oxygen using lungs, have hard, scaly skin, and lay eggs in nests. Some examples of animals that are in my group are lizards and snakes. What group of animals am I? (reptiles)
- I do not have a spine, and I am the group that makes up most of the animals on Earth, including insects, arachnids, crustaceans, and many other types of animals. What group of animals am I? (invertebrates)
- At the beginning of my life I am an aquatic animal and breathe using gills. But as I grow, I slowly develop lungs and morph into a water and land animal. What group of animals am I? (amphibians)
- I have three classes: bony, cartilaginous, and jawless, and I am cold-blooded. What group of animals am I? (fish)
- I am a classification of animals that is made up of amphibians, mammals, birds, fish, and reptiles that all have backbones. What group of animals am I? (vertebrates)

Remind students that in the previous lesson, they learned more about reptiles. Review with students the Classification Chart from previous lessons, being sure to include in the discussion that reptiles have hard,

scaly skin, that they lay eggs in nests on land, and that they breathe air through lungs. Tell students that in today's read-aloud they will learn more about another group of animals that lays eggs in nests: birds.

What Do We Know?

Ask students to close their eyes and picture a bird they've seen or heard, whether it was in a picture, movie, or show, on a hike, in their backyard, etc. Now ask them to share what they know about birds by listing the characteristics of birds they've observed.

Now have students share with a partner in one sentence something they would really like to learn about birds. Tell students they may start their sentence with, "One thing I'd like to learn about birds is ..." or they can write a direct question such as "Why do birds...?" Each student will write down on an index card the one thing his/her partner wants to know. When both partners have had the opportunity to write a sentence about what the other would like to know, have them read their sentences to each other. Give them time to clarify meaning and make corrections in expressing their partner's ideas.

Purpose for Listening

Tell students to listen carefully to today's read-aloud to learn more about birds, particularly about their beaks and feet, and to possibly learn the answer to their questions. Also, tell students to listen for the main ideas, or important points, in the read-aloud, and let them know that you will discuss the main ideas later.

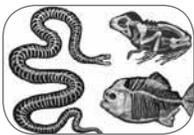


Birds: Wings and Feathers

← Show image 7A-1: African habitat with Ebenezer Egret

Hello, folks. It's me, Rattenborough once again. If you recall, you learned all about reptiles last time. How exciting that was! Can you remember which group of animals you are going to hear about today? Birds! I can't wait to tell you all about my friend Ebenezer. I met him on the continent of Africa.¹ Before I tell you about him, I thought we would begin today's lesson by quickly reviewing how Paolo, Tabitha, and Anna are related to each other. Remember, just because they don't look the same, they do have quite a bit in common, beginning with the fact that they are all members of the animal kingdom.

1 [Ask a volunteer to point to Africa on a world map or globe.]



← Show image 7A-2: Three animal skeletons

I brought along special diagrams of their skeletons to help you. Can you tell which skeleton belongs to each animal? What common characteristic is visible in all three?² Yes, all three of them have backbones, so as you probably recall, scientists classify them as . . . Yes—vertebrates!

2 [Pause for students to share.]

We're not going to spend much time talking about their internal body temperatures today. By now you should know that none of them have constant body temperatures. Paolo, Tabitha, and Anna are all cold-blooded and their temperature changes depending on their surroundings. That makes two characteristics that all three of them hold in common: the fact that they are all vertebrates, and the fact that they are all cold-blooded animals. So, now let's see where Ebenezer Egret fits in. We know that he belongs to the animal group classified as birds. Let's confirm it: are birds vertebrates?³

3 [Pause for students to share.]



← Show image 7A-3: Anatomy of a bird

Indeed they are. Ebenezer has a strong backbone that reaches all the way up his long neck and supports his head. His bony skeleton is very important. His bones are extremely light with lots of air **cavities**, or hollow places, inside them to help him fly. He

uses his muscular legs to push off the ground, and then his wings take over. The weight and arrangement of his bones help him soar through the air.



← **Show image 7A-4: Egrets and Ebenezer in flight**

Birds are the lucky ones, aren't they? How many of you have ever wished that you could fly? I do like very much being a rat, but sometimes I think it would be great fun to fly. Ebenezer is very graceful, isn't he? So far you have learned in detail just about cold-blooded animals—reptiles, amphibians, and fish. Do you think Ebenezer and all birds are cold-blooded, too?⁴ Scientists classify birds as warm-blooded, because their internal body temperature remains constant no matter where they fly.

4 [Pause for students to share and have them explain why.]



← **Show image 7A-5: Egrets**

Birds have several characteristics that enable them to fly, but being warm-blooded is essential to flight. They have a very high **metabolism** as only warm-blooded animals do. Metabolism is the process which produces energy in most animals' bodies. When we speak about the high metabolism of birds, we are speaking about the fact that they have a steady flow of energy that helps them maintain the high levels of activity required by flight. The higher the activity level of an animal, the higher its metabolism is likely to be. What this means when it comes to eating is that they need lots of food to maintain that energy.

Have you ever heard the saying “eats like a bird” for someone who eats very small amounts of food at one time? Ebenezer told me that an important thing to remember about this expression is that it does not mean that birds do not eat very much. In fact, Ebenezer and birds like him need to eat two times their body weight in food every day, because they have such a high metabolism and burn lots more energy than most animals.⁵ Of course, there are lots of small meals a day for birds, quite unlike Anna Anaconda who sometimes eats only one big meal in a period of many days. So, someone who “eats like a bird” is usually someone who “picks” at their food and only eats small bits at a time.

5 If you needed the same amount of food in a day that a bird needs, you would be eating about one hundred pounds of food every day!



6 [Pause for students to share.]

← **Show image 7A-6: The sun and the food chain**

What is the primary source of energy for organisms like you and me?⁶ The sun. You may have learned about food chains and cycles in nature. You may learn more about food chains in the Grade 3 *Ecology* domain. Green plants capture the sun's energy, and it is transferred to animals when they eat plants or plant-eating animals. Energy from the sun powers everything we do on Earth.

Unlike cold-blooded animals that depend upon their surroundings to regulate internal body temperatures, warm-blooded animals are able to produce heat for energy within their own bodies. They can travel farther and live in more extreme conditions than cold-blooded animals. However, because cold-blooded animals have a much lower metabolism, they do not need as much energy to stay alive. Remember what I just said about the eating habits of Ebenezer compared to Anna? The only warm-blooded animals that are able to go without food for long periods of time are hibernating animals. That's because their metabolism slows way down when they are hibernating, and they require less energy to stay alive.



7 [Pause for students to share.]

8 You just heard about the bones in bird wings. Who can tell me what helps to make a birds' wing bones lightweight? (cavities, or hollow spaces)

← **Show image 7A-7: Ebenezer and real egret**

So, like all birds, Ebenezer is warm-blooded. And he's a vertebrate with lightweight bones to help him fly. Look at this image, and describe some other physical characteristics that help scientists classify Ebenezer as a bird.⁷ Good eyes, boys and girls.

Let's begin with his wings. Ebenezer has wings, and wings are essential to flight. The shape of a bird's wings determines how far and high a bird can fly, in addition to its lightweight bones.⁸



← **Show image 7A-8: American bald eagle and hummingbird**

Look at this picture of an American bald eagle. His long, broad, wings are built so that he can **glide**, or move smoothly and continuously. He can soar great distances, traveling up to sixty-five miles per hour. Compare the eagle's wings to the tiny, tapered wings of the hummingbird, one of the smallest birds on Earth.⁹ His wings beat rapidly, twenty or more beats per second, as he hovers, or floats and flutters, in midair.

9 [Point to the tapered wings of the hummingbird in the image.] When something is *tapered*, it becomes gradually smaller or thinner on one end.

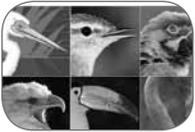


← **Show image 7A-9: Bird feathers**

What else helps Ebenezer and all birds fly? Feathers are a great help, serving as lightweight coverings for their wings. They mesh together as their wings flap downward, parting again to let air through as their wings sweep upward again. Feathers, also act as **insulation**. Insulation is an extra layer that protects birds' skin from the sun and traps in heat, providing energy and warmth in the winter months. The point of the feather where it is attached to a bird's body is called the quill.¹⁰ All birds have feathers. No other animals do, so if you spot a feathered friend, you may assume that it's a bird. Because their precious feathers take quite a beating, birds take good care of them, and often preen them¹¹ with their beaks to keep them clean, waterproof, and in the right position.

10 [Show Image Card 17 (Bird Feather Quill).] The quills of bird feathers were once used as writing tools. People would dip them into an ink pot for writing on paper.

11 or make them neat



← **Show image 7A-10: Ebenezer's beak, a finch's beak, and other bird beaks**

Take a look at Ebenezer's beak. Isn't it a beauty? Not all birds have such long beaks. Why do you think his is so long?¹² Well, I'll tell you. He told me it's a terrific hunting weapon. He uses the end of his beak to grab small prey such as snails and crayfish in the surface waters of the marshland and to spear larger prey such as frogs and snakes on marshy wetlands.

12 [Pause for students to share.]

Appearing in many different shapes and sizes, beaks are often used to identify birds. Their main function is for feeding, so a bird's beak can provide scientists with clues to a bird's eating habits. Take a look at this finch's beak.¹³ Depending upon where you live, you may have seen a finch at your bird feeder. They use their beaks to crack open seeds. Next time you see a bird, look at his beak and see if you can guess whether it eats fish, seeds, insects, mice, or nectar.¹⁴

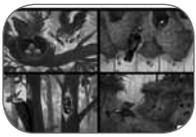
13 [Point to the top middle image.] Do you think this little beak can spear an animal the same way an egret's beak can?

14 [Point to the remaining beaks.] How would you describe the features of these beaks?



15 [As you read the following sentences, point to the corresponding images.]

16 Remember you heard in a previous read-aloud that a particular animal has webbing between its claws? Who can tell me which reptile that is? (pond turtle)
Animals with webbed feet have a layer of skin between each of their toes.



17 You learned in the last read-aloud that reptile eggs are often calcified. Who can tell me what *calcified* means?

← Show image 7A-11: Bird feet¹⁵

Birds' feet are another clue to different bird habitats and lifestyles. Hawks have long talons, or claws, to catch their prey; waders have long legs; woodpeckers have feet adapted to climbing trees; perching birds have single hind, or rear, toes for grasping branches; and ducks and geese have **webbed** feet for swimming.¹⁶

← Show image 7A-12: Bird nests

Birds are the only group of animals that give birth by only one means—there are fascinating pattern-breakers in all of the other groups. All birds lay eggs. Their eggs are yolk-filled and have hard, calcified shells.¹⁷ They need to be incubated, or kept warm, so the parents sit on them until they hatch. This can be dangerous because sitting birds are prime targets for predators. Most birds prepare a **nest**, or shelter for their young, using whatever materials are available to them in nature. Some make nests from twigs and straw; others build nests of mud; woodpeckers create cavities in trees, whereas kingfishers bore into riverbanks. These nests provide safe havens, or safe places, protecting both eggs and baby chicks from harsh weather and animal predators.

Some birds, like chickens, are able to see, walk, and feed themselves almost immediately after hatching. However, many birds are born in a very immature stage and require a lengthy period of parental care.



← Show image 7A-13: Ostrich, emu, and penguin

We spent lots of time today talking about what helps birds fly—strong muscles, light bones, powerful wings, and airy feathers. But did you know that in spite of having all those things in common, some birds are unable to fly? Flightless birds include the largest bird on Earth, the ostrich. With a seven-foot wingspan, it seems

18 What other animals have you learned about that swim through water? (fish, turtles, salamanders, etc.) Who can tell me the body parts that help these animals swim effectively? (tails, fins, webbed or oar-shaped feet)



odd that ostriches can't fly, but they hold records for being both the fastest birds on land and the fastest two-legged animals on Earth, able to run up to forty miles per hour! Australian emus [EE-myooos], also large and flightless, look a lot like ostriches and often travel long distances to find food. Penguins are perhaps the most endearing, or affection-inspiring, of all flightless birds, marching upright like people as they move around in their habitats. These aquatic birds of the Southern Hemisphere waddle along on their short legs and webbed feet down to the sea. Their wings serve as flippers to carry them swiftly through arctic waters, traveling up to fifteen miles per hour.¹⁸

← **Show image 7A-14: Birds in different habitats**

Birds live all over the world—in cool, wet rainforests; along ocean shores; in dark, dense evergreens; in hot, dry deserts; and on the banks of lakes, rivers, and streams. Some travel long distances, migrating to warmer homes in winter, whereas others are homebodies, never straying very far from where they were born. Some can swim and others can fly. Some enchant us with their songs, whereas others shout, “Caw-caw!” Birds come in all different shapes and sizes, but all birds are warm-blooded, egg-laying vertebrates with feathers and wings.

Birds are very different from the animals we will study next time. So far, you've learned about fish, amphibians, reptiles, and birds. What do you suppose is next? I'll give you a hint. They're hairy and warm-blooded, and you may just find that you know more about them than you think you know! Thank you for being such good listeners. I will see you very soon!

Comprehension Questions

15 minutes

Note: Fill in the Classification Chart where appropriate as you move through the comprehension questions. If students bring up a pattern-breaker in their responses, be sure to include that in the appropriate column.

1. *Inferential* Birds live all over the world in different habitats. What are some of these habitats? (hot, dry deserts; cool, wet rainforests; dense evergreens; near lakes, rivers, streams, and oceans)
2. *Literal* What body part do birds have that enables them to fly? (wings) Bird bones have lots of cavities in them which help make them lighter and able to fly. What are cavities? (hollow places in the bones)
3. *Inferential* What is the job of the feathers on birds? (They provide insulation and waterproofing to protect skin and trap heat; they help them fly by being lightweight and by meshing together and parting, which pushes against air and then lets it through.)
4. *Inferential* In addition to cavities in their bones, birds must also have a high metabolism in order to fly. Why is a high metabolism important for birds? (because it provides a steady flow of energy in order for them to be highly active)
5.  *Evaluative* Describe the difference between the way a hummingbird flies and an eagle flies. (A hummingbird beats its wings very, very fast; an eagle glides and soars.) What would you say is the cause of these two different types of flight? (large, broad wings on the eagle compared to tiny, tapered wings on a hummingbird)
6. *Inferential* Why do birds build nests? (for protection for their young; for homes) What are the different types of nests you heard about? (twigs and straw; mud; cavities in trees; holes in riverbanks)
7.  *Evaluative* In one or two sentences in your Classification Journal, write the characteristics that classify an animal as a bird. (warm-blooded, vertebrate, has wings with feathers, builds nests, lays eggs)

8.  *Evaluative* Compare and contrast the various kinds of bird feet with turtle or tortoise feet. (Some bird feet that are similar to turtle/tortoise feet are the webbed feet and the feet for climbing, which are similar to the webbed feet of pond turtles and clawed feet of the giant tortoise. Some birds that have feet that are different than turtles/tortoises are those with talons.)
9. *Evaluative* A friend tells you that an ostrich is not a bird because it cannot fly. How would you convince your friend that an ostrich is a bird? (Answers may vary, but may include that it is a warm-blooded vertebrate with feathers and wings, that it makes nests and lays eggs; and that it can still be a bird even if it is a pattern-breaker.)
10. *Evaluative* Compare a penguin's wings to the wings of other birds that can fly; compare a penguin's wings to fish fins. (Answers may vary.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

11.  *Evaluative Think Pair Share:* Compare and contrast birds and fish. Be sure to include all the classification categories on the classroom chart. (Answers may vary.)
 12.  After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions? [Have students reread the question they wrote on an index card before the read-aloud. Ask a few volunteers to share their questions along with the answer they heard, or to share just the question even if there was no answer. For students who may not have received answers to their questions, ask them to circle the question. You may want to have those who did receive answers place a check mark next to their question. Students will keep these index cards tucked inside their Classification Journals.] Was your question about birds answered in today's read-aloud? Do you have any remaining questions? [You may advise students that it is possible they may hear an answer later in another read-aloud.]
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Metabolism

5 minutes

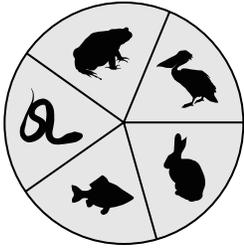
1. In the read-aloud you heard that warm-blooded animals “have a very high *metabolism*.”
2. Say the word *metabolism* with me.
3. Metabolism is the process in living animals whereby energy is made from cells in the body as they are produced and as they break down. The higher the activity level of an animal, the higher its metabolism is likely to be.
4. As our dog grew older, his metabolism slowed down, so he didn’t need to eat as much food as when he was a puppy.
5. Name an animal and then describe whether you think it would have a higher metabolism or a lower metabolism. Be sure to use the word *metabolism* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I think _____ would have _____ metabolism because...”]
6. What’s the word we’ve been talking about? What part of speech is the word *metabolism*?

Use a *Complete the Sentences* activity for follow-up. Directions: I am going to begin some sentences that describe higher metabolism or lower metabolism. After I’ve spoken the first part, I want you to finish the sentence by saying, “has a higher metabolism” or “has a lower metabolism.”

1. A hibernating bear... (has a lower metabolism.)
2. If an animal’s body is slowing down, it... (has a lower metabolism.)
3. A hummingbird beating its wings rapidly... (has a higher metabolism.)
4. A cat that is asleep on the windowsill . . . (has a lower metabolism.)
5. A marathon runner in a race... (has a higher metabolism.)
6. Compared to a warm-blooded animal, a cold-blooded animal... (has a lower metabolism.)



Complete Remainder of the Lesson Later in the Day



Birds: Wings and Feathers

7_B

Extensions

20 minutes

Brainstorming About Birds (Instructional Master 7B-1; 1B-1, optional)

Using the Classification Chart on display in the room and Instructional Master 7B-1, students will gather information as reinforcement and also as notes for the formal paragraph assignment they will write later in this domain.

In the central oval on the instructional master, students will write the name of the vertebrate animal group they have learned about today. (birds) Then, in each of the surrounding ovals, students will write words and/or phrases that describe the characteristics of animals in that group. They should also include in one of the surrounding ovals examples of animals in this group based on what they heard in the read-aloud today.

In the central oval and/or on the back of the worksheet, have students illustrate an animal they learned about today.

Tell students they will refer back to these Brainstorming Graphic Organizers when it comes time to write their paragraphs—that these ideas will be their notes/research at that time.

Note: You may guide students through this activity as a whole group, place them into small groups, or have them work with partners as you see fit.

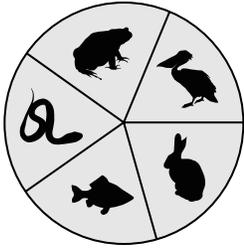
- You may wish to have some students fill out Instructional Master 1B-1 independently along with Instructional Master 7B-1.

Summarizing the Main Ideas of the Read-Aloud

In this extension you will model for students how to actively listen and take notes by rereading the read-aloud while having them do the following:

- In preparation for this activity, pick out two or three core vocabulary words from the read-aloud you plan to reread, and write them on chart paper, a chalkboard, or a whiteboard.

- Begin by asking a few volunteers to share what they would say the main ideas are regarding the read-aloud you are about to reread. Have them reference the Classification Chart and Instructional Master 7B-1 as needed. This discussion is meant as a review and warm-up for active listening. Point out the core vocabulary words you have chosen, and have students read them together chorally. Tell students that as you are rereading, they should be carefully listening, especially when you get to one of the words on the board.
- Tell students that as you read, they will be jotting down notes—words or short phrases that best express the main ideas. Be sure to tell them that they should not be writing in complete sentences. You may wish to model and have students follow an outline style. As you read, you may want to slow down or even pause after reading the Guided Listening Supports that follow the core vocabulary words you have chosen.
- When you are finished rereading the read-aloud, have a few volunteers share one or two notes they have taken. Be sure to give feedback to help shape effective notes, and allow students to record any modifications you guide them through.
- Now have students summarize in two or three sentences the main ideas for this read-aloud, using the three core vocabulary words in their sentences.



Mammals: Live-Bearing Milk Producers

8

✔ Lesson Objectives

Core Content Objectives

Students will:

- ✓ Observe and describe basic characteristics of an animal
- ✓ Explain that scientists classify animals by common or shared characteristics
- ✓ Explain that scientists classify animals in order to study them and show relationships
- ✓ Classify particular animals as vertebrates or invertebrates
- ✓ Classify particular animals as cold-blooded or warm-blooded
- ✓ Identify basic characteristics of mammals
- ✓ Classify particular animals as mammals
- ✓ Compare and contrast two groups of vertebrates

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Determine the literal and nonliteral meanings of and appropriately use common sayings and phrases, such as “the show must go on” (RI.3.4) (L.3.5a)
- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Classifying Animals by Characteristics” (RI.3.7)
- ✓ Interpret information about animal characteristics and their classifications from diagrams, charts, graphs, and graphic organizers (RI.3.7)

- ✓ Compare and contrast the characteristics of mammals and birds, and the reproduction process of mammals and other animals, in “Mammals: Live-Bearing Milk Producers” (RI.3.9)
- ✓ Identify and use parts of a paragraph, including a topic sentence, supporting details, and a concluding sentence in an informative writing piece (W.3.2a)
- ✓ Use the information categorized in charts, graphic organizers, and journals to review and group related information while planning and drafting a paragraph for an informative writing piece about a select vertebrate’s characteristics and classification (W.3.2a)
- ✓ Begin drafting an informative writing piece about a select vertebrate’s characteristics and classification, clearly stating ideas, facts, and details (W.3.2b)
- ✓ Use linking words and phrases such as *also*, *another*, *because*, *finally*, and *in addition* to connect ideas within paragraphs (W.3.2c)
- ✓ With guidance and support from peers and adults, use the steps of the writing process, such as plan, draft, revise, edit, and publish, to create an informative writing piece that will be developed and strengthened over an extended time frame (W.3.5) (W.3.10)
- ✓ Conduct short research projects that build knowledge about a select vertebrate’s characteristics and classification (W.3.7)
- ✓ Gather information about mammals from the text and images of “Mammals: Live-Bearing Milk Producers” and information about a select vertebrate from their charts, graphic organizers, and journals; take brief notes and sort evidence into provided categories (W.3.8)
- ✓ Classify and organize the characteristics of mammals; categorize information about an additional select vertebrate’s characteristics and classification in planning and drafting an informative paragraph (W.3.8)
- ✓ Make predictions about what the closest known relative of the hippopotamus may be during “Mammals: Live-Bearing Milk Producers” based on the title, images, and text heard thus far, and then compare the actual outcomes to predictions (SL.3.1a)
- ✓ Summarize (orally and in writing) information about the characteristics and classification of mammals and one additional vertebrate’s characteristics and classification (SL.3.4)

- ✓ Choose words and phrases to effectively describe the characteristics of mammals and an additional select vertebrate’s characteristics and classification (L.3.3a)
- ✓ Use a known root word as a clue to the meaning of an unknown word with the same root, such as *mammal/mammalia/mammary*, *kin/kind/kindred*, and *inform/information/informational* (L.3.4c)
- ✓ Provide and use synonyms for the word *aquatic* (L.3.5b)
- ✓ Draw illustrations to represent the characteristics of mammals from “Mammals: Live-Bearing Milk Producers”

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

diaphragm, n. A layer of muscle that separates the upper and lower body sections in mammals and creates a space for the lungs to expand when they breathe in oxygen

Example: The diaphragm is a muscle in your body that works automatically without you thinking about it!

Variation(s): diaphragms

infancy, n. The very early stage of life in which a mammal gets nourishment from its mother’s milk

Example: During a fawn’s infancy, it stays close to the mother deer.

Variation(s): infancies

mammary glands, n. Milk-producing organs found in female mammals

Example: When a farmer milks a cow, he is collecting the milk produced by the cow’s mammary glands.

Variation(s): mammary gland

marine, adj. Related to the sea

Example: Dr. Sylvia Earle, a well-known marine biologist, has spent her career learning about life in the oceans.

Variation(s): none

stately, adj. Grand or impressive in size or manner

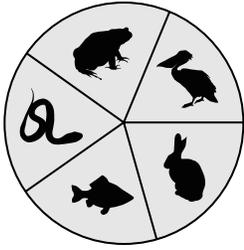
Example: Looking like a queen, the peacock spread out its stately wings and strutted around the yard at the zoo.

terrestrial, *adj.* Pertaining to land as opposed to water

Example: When we set up the habitat for our classroom lizard, our teacher asked us to bring in some terrestrial plants to put inside the terrarium to make the lizard feel at home.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	Image Cards 18 and 19 Classification Chart Classification Journals	10
	What Do We Know?		
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Mammals: Live-Bearing Milk Producers	Image Cards 20–22 world map or globe	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	Image Card 21 Classification Chart Classification Journals	15
	Word Work: Stately		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Sayings and Phrases: The Show Must Go On		5
	Brainstorming About Mammals	Classification Chart Instructional Master 8B-1 Instructional Master 1B-1, optional	15
	Writing an Informational Paragraph: Plan/Draft	Instructional Masters 4B-1, 5B-1, 6B-1, 7B-1, 8B-1, and 8B-2	
<i>Take-Home Material</i>	Family Letter	Instructional Master 8B-3	



Mammals: Live-Bearing Milk Producers

8A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Point to the Classification Chart. Remind students that so far in this domain, they have learned about fish, amphibians, reptiles, and birds. Review with students the Classification Chart from previous lessons, being sure to include in the discussion which groups of vertebrates are cold-blooded and how all of the animal groups discussed so far—with the exception of the pattern-breakers—reproduce by laying eggs.

Now remind students that in the previous read-aloud they learned specifically about birds. Ask, “Who can tell me if birds are warm-blooded or cold-blooded?” (warm-blooded) Review with students that, unlike reptiles, birds need to eat frequently in order to maintain a high metabolism. Also remind them that like reptiles, birds lay eggs. Show Image Cards 18 (Bird Beaks) and 19 (Bird Feet). Ask for volunteers to describe some different kinds of bird beaks and feet, and explain what these tell us about how birds behave. (long talons on birds of prey—to catch and kill prey; long legs on waders—to be able to walk in shallow water without getting their bodies wet; single rear toes on perching birds—to grasp a branch solidly; webbed feet for swimming birds—to move through the water effectively) Have a few volunteers read through their complete sentences in their Classification Journals about bird characteristics.

What Do We Know?

Explain to students that they have heard just a little about mammals so far in this domain. Ask them to list any characteristics they may know that mammals have. (warm-blooded, vertebrates, give birth to live young, milk-making glands, fur on their bodies)

Purpose for Listening

Tell students to listen to find out more about this group of hairy, milk-making creatures called mammals.



Mammals: Live-Bearing Milk Producers

← Show image 8A-1: African habitat with Hilda Hippo

Well, boys and girls, it's me, Rattenborough, back again! Today we're going to talk about a group of animals that you already know a little something about—based on your own personal experience. Hilda Hippo is one of these, and I am one of these. Remember our mnemonic? ¹ **All My Best Friends Represent Vertebrates!** Yes, the letter 'M' in the word *My* stands for mammals! And guess what? You are mammals, too!

1 [Pause for students to share.]
Which letter and word stands for the group of animals I will be speaking about today?

Who can name some characteristics of mammals? In what ways are you like Hilda and me? ² What keen observations you make! Yes, we are warm-blooded vertebrates with hair. I think *you* could help *me* teach this lesson.

2 [Pause for students to share.]

Let's begin with the name of this group: mammals. It comes from the Latin word *mammalia*. The word *mammalia* refers to a group of animals who possess **mammary glands**. Mammary glands are milk-producing organs belonging to female mammals. When female mammals give birth, they secrete a nourishing substance—milk—to feed their young. That is one of the primary characteristics of mammals: we feed our young milk. That's right—rats drink mother's milk, hippopotami drink mother's milk, and so do humans! The mother's milk has all the nourishment that a baby needs.



← Show image 8A-2: Mother and baby rats

How wonderful is that! A baby rat that has its mother nearby never has to raid, or charge through, garbage cans for food. He can stay inside where it's warm, enjoying a lovely liquid meal prepared by his mother's own body. Ah, looking at this slide makes me a little sad when I think back on the days when my mom always had a warm meal ready for me—before the days when I became an adult and now have to hunt, sometimes for long, grueling days, just to find a scrap . . . er . . . oops! Excuse me, students! I just got lost in

a lovely memory from my childhood. Please forgive me and we'll get back to my slides about mammals. After all, "the show must go on!"

Mammals have backbones! Reach around and check out your back once more to make sure your backbone is still there! Of course it is. Without backbones, we wouldn't be able to sit up straight or hold our heads in the air. And our spinal cords that house the nerves that send messages to our brains would be unprotected! So, because we all have backbones, scientists call us . . . what? Yes, quite right—we are all vertebrates.



← **Show image 8A-3: Turtles and horses**

Reptiles, amphibians, and fish all have a relatively low metabolism and, as you have learned, are classified as cold-blooded animals.³ Like birds, mammals, such as this horse, have a high metabolism, burning lots of energy to help them maintain a constant internal body temperature.⁴ What is the term that taxonomists use to classify mammals in terms of body temperature?⁵ Yes, we are all warm-blooded.

3 [Point to the turtles.]

4 [Point to the horse in the image.]

5 [Pause for students to share.]



← **Show image 8A-4: Hippopotamus snout through binoculars**

One of you was right when you said that mammals are covered in hair or fur. Some of us are hairier than others. Hilda Hippo and other hippopotamuses don't look so hairy, do they? But you might remember that they do have a little bit of hair around their mouths and on the tip of their ears and tails. Let's take a look at a few of our furrer friends.



← **Show image 8A-5: Giraffe and yak**

Here's one of my favorite mammals. I love his **stately** long neck and envy his ability to reach high into trees to eat leaves and to see into the distance. I'll bet that if I were as tall as a giraffe, I could spot my enemies more quickly.

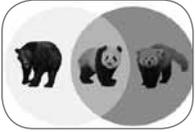
Does anyone know what this other animal is? It's a yak. Yaks need their shaggy hair and dense woolly undercoats to help keep them warm on the cold Tibetan Plateau where they live.⁶

6 [Have a volunteer point to Tibet and Asia on a world map or globe.] The Tibetan Plateau on the continent of Asia is the largest and highest highland in the world.



← **Show image 8A-6: Bengal tiger and snow leopard**

Tigers and leopards have fur, too. Look at this Bengal tiger and this beautiful snow leopard of Central Asia. Both of these cat species are on the list of endangered species, a list of animals whose numbers have dwindled due to the loss of habitats and over-hunting.



← **Show image 8A-7: Giant panda with black bear and red panda**

Furry bears come in all shapes and sizes and live in all different parts of the world. Look at this giant panda. It has many characteristics found among different kinds of bears—polar bears, black bears, grizzly bears, and sun bears.⁷ The giant panda is a good example of an animal which has proven challenging to classify—taxonomists have actually changed their minds about which animal it is most closely related to. They used to classify the giant panda with the red panda in a group that included raccoons. Now with the help of more modern scientific tools, taxonomists believe the giant panda to be more closely related to bears, even though it eats mostly bamboo.⁸

7 Who can tell me what the first three letters in the word *kind* are? There are two other words that have the same letters that start the word *kind*. *Kindred* and *kin*, which mean same kind or family, are words to describe people who are related or who seem like family.

8 [Show Image Card 20 (Modern Scientist).] The special computer equipment that this scientist is using helps taxonomists see the important parts within animal cells. Using this, scientists realized more recently that the giant panda has a tiny cell part that is most similar to a tiny cell part in bears.



← **Show image 8A-8: Marmot and flying squirrel**

Does anyone know what this is?⁹ It's a marmot, a type of squirrel. And here's another type of squirrel—a flying squirrel! These squirrels don't really fly, but they have two folds of skin on the sides of their bodies that let them take great leaps, gliding through the air with the help of their tails for steering. The only mammals that can truly fly are bats. They have skin between their long fingers that stretches out, turning arms into wings when they open. Bats may seem like birds, but they are not because they have no feathers—they actually have a fine fur; and bats give birth to live young.

9 [Point to the marmot on the left.]



10 [Ask for volunteers to name the animals in the image.] (horse, sheep, deer, fox, rabbit, and cat)

← **Show image 8A-9: Various mammals**

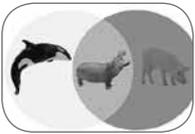
I think you'll recognize these more common mammals.¹⁰ And I'll bet some of you have furry mammal pets, don't you? Take a look at the fur on this cat. Now that's what I call furry! This is a Maine coon cat. I must say his fur puts my fur to shame!

Most, but not all, mammals are **terrestrial**, meaning that they live on land. Can anyone think of an aquatic mammal, a mammal that lives in water? I'll give you a hint. One of them is my friend—Hilda!



← **Show image 8A-10: Hippopotamus in water**

Ah, yes. Hippopotami love the water. But they are actually semi-aquatic, meaning that they live partly in water and partly on land. Usually Hilda and other hippopotami stand in the water during the day to keep cool. Then, they graze on land when evening falls.



11 You just saw a Venn diagram of a giant panda and heard that it was challenging for taxonomists to classify it. Which animal do you think may have been challenging to classify in this Venn diagram? (hippopotamus) Make a prediction about what may be the closest living relative of the hippopotamus.

← **Show image 8A-11: Hippopotamus with whale and pig¹¹**

Through recent study and discussion based on the data of the special computer equipment you just heard about, taxonomists now think that the closest living relatives of hippopotami are whales, which are fully aquatic mammals. Scientists used to think that hippos were most closely related to pigs, but now new information from modern scientific tools is changing the way hippos are classified.¹²

12 Were your predictions correct?



← **Show image 8A-12: Aquatic and semiaquatic mammals**

Whales are **marine** mammals, meaning that they live in the ocean. The blue whale is not only the largest mammal, it is the largest animal on Earth. Blue whales can grow up to one hundred feet long; that's a little longer than a basketball court! Its tongue alone weighs more than three tons! Imagine that! Manatees and smaller whales such as dolphins and porpoises are also fully aquatic, marine mammals. They share saltwater seas with walrus and seals, semiaquatic animals that like to wander on shore just like Hilda Hippo does.

Marine mammals are believed by many scientists to have evolved from land mammals, and they share many of the same characteristics. They are warm-blooded, have backbones and fur or hair—even though sometimes it is the tiniest amount of hair—and they breathe oxygen from the air. Remember when we talked about how fish use gills to breathe in oxygen from the water? Remember how in amphibians those gills develop into lungs, requiring amphibians to come to the surface of the water to breathe air? Well, mammals also have lungs. All mammals have lungs and an underlying **diaphragm** that assists breathing.¹³ When the diaphragm tightens, it creates more space in the lung cavity, and air is drawn into the lungs. All mammals, including whales and porpoises, dolphins and manatees, must come to the surface of the water now and then to breathe.

13 [Show Image Card 21 (Diagram of Diaphragm).] This is an image of a human diaphragm, which is a thick sheet of muscle beneath the lungs. The diaphragm in animals works the same way.



← **Show image 8A-13: Capybara, beaver, and duck-billed platypus**

Some mammals also live in fresh water. I want to introduce you to another semiaquatic relative of mine. This is a capybara [kappy-BARR-ah]. He, like me, is classified as a rodent and likes to swim. Have I told you, incidentally, that I, Rattenborough, am a good swimmer? I am rather proud of that fact. The capybara can stay underwater for a full five minutes without coming up for air, a feat that helps him escape predators. Did you know that capybaras are one of the favorite foods of anacondas like Anna?

Another semiaquatic mammal, also a rodent, is the beaver. It makes its home near rivers along with river otters. One of the most unusual semiaquatic mammals is the duck-billed platypus. It has a large rubbery bill like a duck in the bird group, the flat, broad tail of a beaver in the mammal group, and reptilian webbed feet. This odd, venomous creature lives in Australian waters.

The duck-billed platypus is unusual for another reason. It is one of only a few mammals that lay eggs. Spiny anteaters, also natives of Australia and nearby islands, are the only other egg-laying mammals. All other mammals are live-bearing, which means they give birth to live young. The young are nourished inside the mother's body, and most are fully developed when they are

14 [Show Image Card 22 (Marsupial's Pouch).] A marsupial is a kind of mammal with a pouch that serves two purposes—it is the place where a newborn marsupial lives, and it contains the mammary glands.

born, looking like smaller versions of their parents. A few, like kangaroos and opossums, are part of a group of mammals called marsupials.¹⁴ Marsupial babies are very underdeveloped when they are born, but they move directly to the mother's protective pouch to be nourished by her milk. All mammals, whether hatched from eggs or born live, feed on the mother's milk in their **infancy**.

As warm-blooded animals with high metabolic rates, mammals must eat more food than other animals their size in order to store enough energy to keep their bodies warm. So what do mammals eat? Think of all the different types of mammals that you've learned about today. Then think about your own diet. Do you eat the same foods as cats or dogs? Do elephants eat oranges? Do whales eat green beans?

Mammals eat a variety of foods, depending upon where they live. Some mammals are carnivores, or meat-eaters; others are herbivores, eating only plants; still others eat both plants and animals and are called... Yes—omnivores!



← **Show image 8A-14: Wolf and deer with respective skeletons**

Remember learning that birds' beaks may provide clues to their diets? The same is true of mammals' mouths. Wide mouths and sharp pointed teeth suggest that these mammals may be carnivores. Wolves, whales, and bats are all carnivores. Herbivores are more likely to have long jaws, long tongues, and flat teeth. Deer, sheep, monkeys, and pandas are all herbivores. Omnivorous mammals include bears, opossums, chipmunks, and mice. Many humans are omnivores, but humans *think* about the choices they make about what to eat. Omnivores generally have sharper front teeth and flat teeth for chewing in the back of their mouths. Think about your mouth. Do you think humans were designed to eat meat, only plants, or both meat and plants? Why?¹⁵

15 [Pause for a few students to share.]

Next time, we'll look at the last of my slides. Be ready for a review of the five vertebrate groups of the animal kingdom—amphibians, mammals, birds, fish, and reptiles. I'm sure you are becoming quite skilled at classifying animals, and we'll get to have some fun with doing just that. Can't wait—see you soon!

Comprehension Questions

15 minutes

Note: Fill in the Classification Chart where appropriate as you move through the comprehension questions. If students bring up a pattern-breaker in their responses, be sure to include that in the appropriate column.

1. *Inferential* What word part is the same in the words *mammalia*, *mammal*, and *mammary*? (*mamma*) What do all of these words have in common? (They describe mammals.) What are mammary glands? (organs in mammals that produce milk) Why is the milk important? (to feed their young in infancy)
2. *Inferential* How would you describe the body covering of a mammal? (It is covered with hair or fur.) How does the fur on a yak and on other mammals help them? (It keeps them warm.)
3. *Inferential* You heard in the read-aloud that giraffe's have long, stately necks. How does this body characteristic help the giraffe? (It offers protection because it helps the giraffe to spot enemies easier from a distance; it enables the giraffe to reach and eat leaves in tall trees.)
4. *Inferential* In the read-aloud, you heard that most mammals are terrestrial. What does that tell you about where they live? (on land) Do all mammals live on land? (No, marine mammals live in the water.)
5. *Inferential* What is the main organ mammals use to breathe? (lungs) [Show Image Card 21 (Diagram of Diaphragm).] Who can tell me what this muscle is called and why it is important? (diaphragm—It tightens and makes room for the lungs to expand, and then it expands in the lung cavity when an animal or human breathes out.)
6. *Evaluative* Think about all five vertebrate animal groups, and explain what makes reproduction different for mammals compared to all of the other four groups. (Mammals don't lay eggs except for pattern-breakers; most mammals give birth to live young.) What do most baby mammals look like in infancy? (a smaller version of their parents)
7.  *Evaluative* In your Classification Journal, write one or two complete sentences describing the major characteristics of animals in the class of mammals. (Mammals are warm-blooded vertebrates. They have fur or hair, and they have mammary glands to produce milk. They give birth to live babies.)

8.  *Evaluative* Compare and contrast mammals and birds. (Both are warm-blooded vertebrates; however, mammals have fur or hair whereas birds have feathers; mammals give birth to live babies, whereas baby birds hatch from eggs; and mammals have mammary glands, which birds do not.)
9. *Evaluative* Would you say the duck-billed platypus and the spiny anteater are pattern-breakers? (yes) Why? (They are mammals that lay eggs.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

10.  *Evaluative Think Pair Share:* Would you say that humans are semiaquatic? More specifically, are you aquatic? Be sure to explain why or why not. (Answers may vary.)
 11. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Stately

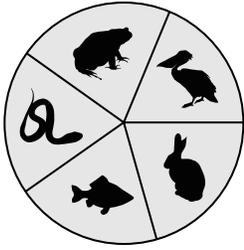
5 minutes

1. In the read-aloud you heard Rattenborough describing a giraffe and saying, "I love his *stately* long neck..."
2. Say the word *stately* with me.
3. When something is stately, it is grand or impressive in size or manner.
4. The stately marching band at my brother's high school football game made the game feel very important.
5. Have you ever witnessed anything that was stately? What was it and where were you? Be sure to use the word *stately* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students' responses to be complete sentences: "When my mom dressed up to go out to a fancy dinner, her stately appearance..."]
6. What's the word we've been talking about? What part of speech is the word *stately*?

Use a *Complete Sentences* activity for follow-up. Ask students, “What does *stately* mean?” Now have a few volunteers form complete sentences that include the word *stately*, along with identifying an animal in one of the five vertebrate groups that they think is *stately*. (“I think a peacock is stately because...”) As time allows, you may wish to allow students to create a list of synonyms for *stately* and/or draw a picture of a stately animal and share it with the class.



Complete Remainder of the Lesson Later in the Day



Mammals: Live-Bearing Milk Producers

8_B

Extensions

20 minutes

Sayings and Phrases: The Show Must Go On

5 minutes

Proverbs are short, traditional sayings that have been passed along orally from generation to generation. These sayings usually express general truths based on experiences and observations of everyday life. Although some proverbs do have literal meanings—that is, they mean exactly what they say—many proverbs have a richer meaning beyond the literal level. It is important to help your students understand the difference between the literal meanings of the words and their implied or figurative meanings.

Ask students if they have ever heard anyone say “the show must go on.” Have students repeat the saying. Ask students to guess what this phrase means. Explain that, literally, this saying means that it is necessary for a show of some sort to continue. The implied or figurative meaning, however, is that any project, event, or plan must be completed no matter what happens.

Explain that this saying, which was in use in the United States starting in about 1867, likely originated with the popularity of the circus. Despite tragic accidents, poor weather conditions, and other setbacks which might have meant cancellation, circus shows usually took place as scheduled.

Ask students what Rattenborough began to think about during his slide presentation today that caused him to get lost in a memory. Tell students that it seemed for a moment that Rattenborough might go on and on about his childhood, but he stopped himself. Ask students, “What did he say to get back to the lesson?” (“The show must go on!”) He was implying that he better get on with his plan—the slide show—because it had to be completed today. Find other opportunities to use this saying in the classroom throughout the year.

Brainstorming About Mammals (Instructional Master 8B-1; 1B-1, optional)

Using the Classification Chart on display in the room and Instructional Master 8B-1, students will gather information to reinforce what they have learned and also as notes for the formal paragraph assignment they will write later in this domain.

In the central oval of the instructional master, students will write the name of the vertebrate animal group they have learned about today. (mammals) Then, in each of the surrounding ovals, students will write words and/or phrases that describe the characteristics of animals in that group. They should also include in one of the surrounding ovals examples of animals in this group based on what they heard in the read-aloud today.

In the central oval and/or on the back of the worksheet, have students illustrate an animal they learned about today.

Tell students they will refer back to these Brainstorming Graphic Organizers when it comes time to write their paragraphs—that these ideas will be their notes/research at that time.

Note: You may guide students through this activity as a whole group, place them into small groups, or have them work with partners as you see fit.

 You may wish to have some students fill out Instructional Master 1B-1 independently along with Instructional Master 8B-1.



Writing an Informational Paragraph: Plan/Draft (Instructional Masters 4B-1, 5B-1, 6B-1, 7B-1, 8B-1, and 8B-2)

Tell students that they are going to choose an animal from one of the five vertebrate groups of animals about which they have learned more specific information from the read-alouds. Ask them to say together out loud the mnemonic for remembering the five groups: **All My Best Friends Represent Vertebrates**. Now ask them to say together out loud the names of the five groups: Amphibians, Mammals, Birds, Fish, Reptiles. Ask students which word in the mnemonic does not represent a specific animal group, but instead a larger group with backbones. (the last word, *vertebrates*) Tell students that each of them is going to write an informational paragraph about an animal and animal group of their choosing, and in the paragraph they will explain why the animal is classified as it is.

Write the word *informational* on the board, and ask what word (or words) students see inside that word. You may wish to underline or box in the word *information* and/or *inform*. Explain that informational writing relays information, or facts, and informs the reader about a certain topic. For example, an informational paragraph may explain how electricity works or why we have four seasons in the Northern Hemisphere. Tell students that sometimes when writing an informational paragraph, a writer may already know information, or facts, about the chosen topic. Explain that many times, however, writers will need to research several sources for information, including books, magazines, websites, etc.

Tell students that they have collected a lot of information that is now available to help them with this informational paragraph. Point out the many helpful sources of information: the Classification Chart on display, students' Classification Journals (including written responses to Comprehension Questions and other questions they may have formed during the read-alouds, including answers to those questions), and the Brainstorming Graphic Organizers. You may also wish to have students reference their Skills reader.

Remind students of the steps of the writing process—plan, draft, revise, edit, and publish—and tell them that all of the notes they have collected along with the Classification Chart on display will provide the information they will need to write their informational paragraph. Remind students that they completed these steps of the writing process when writing an opinion paragraph together in the *Classic Tales: The Wind in the Willows* domain. Tell students that they will each write an informational paragraph with guidance from you.

Have students take out their copies of Instructional Masters 4B-1 through 8B-1. Guide them in looking over these five Brainstorming Graphic Organizers and in deciding on which animal and animal group they are each going to write about. Tell them that the one Brainstorming Graphic Organizer they choose will provide the information and the plan for their paragraphs.

Give each student a copy of Instructional Master 8B-2. Write these three steps on chart paper, a chalkboard, or a whiteboard. Tell students that once they choose an animal, they will do the following:

1. Write a topic sentence.
2. Write at least three supporting sentences from their sources to support the topic sentence.

3. Write a concluding sentence.

Ask, “Who can tell me what a topic sentence is?” Remind students that a topic sentence is the first sentence in a paragraph that tells the reader the main idea of that paragraph. In this case, the topic sentence will make a claim about the chosen animal and how it is classified. Share this example with students: “Frisled dragons, one of my favorite animals, are classified by scientists as reptiles.”

Ask, “What will the supporting sentences, or evidence, provide?” Guide students in understanding that their supporting sentences will provide the reasons for their topic sentence, or claim. This is the information they will research in their sources. Share these example sentences with students: “First, frilled dragons are grouped in the reptiles group because they are cold-blooded. Because frilled dragons do not have a source of internal heat, like you and I do, they need a source of external heat, such as the sun or a heat lamp. Another reason frilled dragons are in the reptile group is that they lay eggs instead of giving birth to live young. Reptiles are also vertebrates, which is why they are grouped together into one group. Finally, frilled dragons have scaly skin like other reptiles, instead of fur or feathers.” Point out the use of transitional words, such as *first*, *another*, and *finally*.

Ask, “Who can tell me what a concluding sentence is?” Remind students that this is the last sentence in the paragraph that wraps up, or concludes, the information and often restates the topic sentence in another way. Tell students that the concluding sentence lets the reader know that the writer is finished with the main idea stated in the paragraph, and that it does not introduce any new supporting information. Share this example with students: “These are the reasons that frilled dragons are categorized as reptiles, and I hope to have one of these awesome reptiles as a pet someday!”

Tell students that they will draft at least five sentences today, but they may also wish to write additional sentences about their chosen animal, such as descriptions of its habitat, eating habits, their thoughts about the animal, and interesting facts, including which animals are pattern-breakers and why. Remind students that they will be able to use what they already know to supply the reasons for the animal’s classification and any other information they would like to include. You may also wish to allow students to research further, using trade books in the classroom book tub, their Skills reader, websites, and other sources.

Encourage students to begin thinking of title ideas and any changes that they think are needed in their paragraphs. Tell students that you will help them revise, or make changes to, this piece during the next writing session.

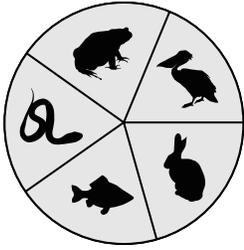
Note: You may wish to model this writing process completely for some students; see the sample paragraph at the end of Lesson 9.

Take-Home Material



Family Letter

Send home Instructional Master 8B-3.



Vertebrate Animals Around the World

9

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✔ Observe and describe basic characteristics of an animal
- ✔ Explain that scientists classify animals by common or shared characteristics
- ✔ Explain that scientists classify animals in order to study them and show relationships
- ✔ Identify cold-blooded/warm-blooded and vertebrate/invertebrate as important characteristics used to classify animals
- ✔ Describe basic characteristics of vertebrate and invertebrate animals
- ✔ Classify particular animals as vertebrates or invertebrates
- ✔ Describe basic characteristics of cold-blooded and warm-blooded animals
- ✔ Classify particular animals as cold-blooded or warm-blooded
- ✔ Identify fish, amphibians, reptiles, birds, and mammals as groups of vertebrates
- ✔ Identify basic characteristics of fish, amphibians, reptiles, birds, and mammals
- ✔ Classify particular animals as fish, amphibians, reptiles, birds, or mammals
- ✔ Compare and contrast two groups of vertebrates
- ✔ Identify insects as invertebrates
- ✔ Identify insects as the most numerous group of animals that have currently been identified

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Distinguish their own point of view from that of the narrator of a read-aloud (RI.3.6)
- ✓ Describe images of various types of animals and their characteristics, habitats, and behaviors, and how they contribute to what is conveyed by the words in “Vertebrate Animals Around the World” (RI.3.7)
- ✓ Interpret information about animal characteristics and their classifications from diagrams, charts, graphs, and graphic organizers (RI.3.7)
- ✓ Compare and contrast the reproductive process of the “pattern-breaker” black alpine salamander and other amphibians in “Vertebrate Animals Around the World” (RI.3.9)
- ✓ Identify and use parts of a paragraph, including a topic sentence, supporting details, and a concluding sentence in an informative writing piece (W.3.2a)
- ✓ Use the information categorized in charts, graphic organizers, and journals to review and group related information while drafting a paragraph for an informative writing piece about a select vertebrate’s characteristics and classification (W.3.2a)
- ✓ Continue drafting an informative writing piece about an animal’s characteristics and classification, clearly stating ideas, facts, and details (W.3.2b)
- ✓ Use linking words and phrases such as *also*, *another*, *because*, *finally*, and *in addition* to connect ideas within paragraphs (W.3.2c)
- ✓ Provide a concluding paragraph for the informative writing piece about a select vertebrate’s characteristics and classification (W.3.2d)
- ✓ With guidance and support from peers and adults, use the steps of the writing process, such as plan, draft, revise, edit, and publish, to create an informative writing piece that will be developed and strengthened over an extended time frame (W.3.5) (W.3.10)

- ✓ With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others (W.3.6)*
- ✓ Conduct short research projects that build knowledge about a select vertebrate’s characteristics and classification (W.3.7)
- ✓ Make personal connections to the experience of being a scientist and narrator of science content in “Vertebrate Animals Around the World” (W.3.8)
- ✓ Gather information about a select vertebrate’s characteristics and classification from charts, graphic organizers, and journals; take brief notes and sort evidence into provided categories (W.3.8)
- ✓ Classify and organize information about a select vertebrate’s characteristics and classification in drafting an informative paragraph (W.3.8)
- ✓ Summarize (orally and in writing) information about the characteristics and classification of a select vertebrate’s characteristics and classification (SL.3.4)
- ✓ Choose words and phrases to effectively describe a select vertebrate’s characteristics and classification (L.3.3a)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

Alpine, *adj.* Characteristic of the Alps, a mountain range in Europe; living high in the mountains above the tree line

Example: The black Alpine salamander is found high in the Alps of Europe.

Variation(s): alpine

antifreeze, *n.* A substance that helps keep liquids from freezing

Example: Wood frogs produce a type of antifreeze that helps keep their bodies from freezing when the temperature drops.

Variation(s): none

delta, n. A triangular area found where a stream or river flows into a bigger body of water and deposits mud and sand in a fan-shaped area

Example: The marshy delta area of the Mississippi River is rich in wildlife.

Variation(s): deltas

hosts, n. The animals or plants on which another organism lives

Example: Dogs may be hosts to ticks that feed on their blood and make them itch.

Variation(s): host

reproduction, n. The process that lets a plant or animal produce offspring, or young, of their own kind

Example: The reproduction cycle in most amphibians includes eggs and larvae.

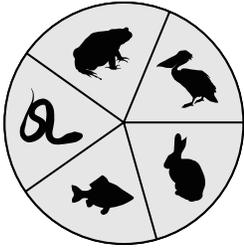
Variation(s): none

tentacles, n. Long flexible body parts that stick out around the head or mouth and are used for feeling or grasping

Example: The stinging cells on the tentacles of a jellyfish paralyze its prey.

Variation(s): tentacle

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	Poster 2 (All My Best Friends Represent Vertebrates!); Classification Chart	10
	What Do We Know?	Classification Chart	
<i>Presenting the Read-Aloud</i>	Vertebrate Animals Around the World	world map or globe	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	Classification Chart	15
	Word Work: Tentacles	drawing paper, drawing tools (optional)	5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Writing an Informational Paragraph: Draft/Revise	Classification Journal; Instructional Masters 8B-2, 9B-1, and 9B-2	20



Vertebrate Animals Around the World

9_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Ask, “Who can tell me what we have been learning about?” Review with students the terms *classification*, *cold-blooded/warm-blooded*, and *vertebrate/invertebrate*. Ask, “What groups of animals have we been learning about?”

Remind students that in the previous lessons, they learned more about five groups of vertebrate animals. Point to Poster 2 (**All My Best Friends Represent Vertebrates!**), and ask students to name the groups. (amphibians, mammals, birds, fish, reptiles) Review with students the columns of the Classification Chart that have been filled in during previous lessons, discussing the characteristics of each vertebrate group. If any spaces in the Classification Chart are still empty, discuss with students what information can be filled in.

What Do We Know?

Remind students that representatives of all five vertebrate groups, as well as invertebrates, live in their community. There may be many animals that students have seen in their neighborhoods, in nearby parks, or on trips to other places near where they live.

Ask, “Who can think of an animal that lives in our community? How would you classify this animal?” Ask students to share their thinking and decision-making about how to classify the animals with questions such as, “Why do you think so?” and “What evidence do you have for classifying a squirrel as a mammal?” Accept both vertebrate and invertebrate animals as part of this discussion. If students have difficulty thinking of an example for one of the groups, you may wish to offer clues to the students so that they will remember an animal that may be familiar.

You may add one or more examples of the students’ ideas to the last row of the Classification Chart, “Local Animals,” or make a separate list showing the classification of local animals.

Purpose for Listening

Explain to students that animals from these five vertebrate groups live all over the world in many different habitats. Tell students that today, they will be hearing about vertebrate animals in seven very different places. Ask students to listen for examples of animals in each of the five vertebrate groups—amphibians, mammals, birds, fish, and reptiles—and to think about the characteristics that help us classify them.



Vertebrate Animals Around the World

← Show image 9A-1: All My Best Friends Represent Vertebrates!

All My Best Friends Represent Vertebrates! Now that you've learned about each vertebrate group, you know about many characteristics that taxonomists use to classify these animals. Who wants to try naming the five groups of animals that make up vertebrates in the animal kingdom? ¹

1 [Trace each letter of the mnemonic. Pause for a few students to share or have the whole group recite chorally. (amphibians, mammals, birds, fish, reptiles)]

2 [Pause for students to share.]

Why do scientists classify organisms? Because there are so many living things on Earth, it gives scientists a way of studying them by showing their relationships. And how do they classify them? They look for common, or shared, characteristics. What are some of these common characteristics? ² You've learned that some animals are warm-blooded and others are cold-blooded. Some are vertebrates and others are invertebrates. You've also learned that there are many other ways to classify animals into smaller and smaller groups. The scientific classification system, taxonomy, uses these names—kingdom, phylum, class, order, family, genus, and species—to describe the groups from largest to smallest.

3 Let's name each of the continents together. [Point to each continent from largest to smallest on a world map or globe, and pause for choral response: Asia, Africa, North America, South America, Antarctica, Europe, and Australia.]

When they classify animals, taxonomists compare and contrast animal habitats, physical characteristics, skin coverings, feeding habits, and **reproduction**. Today we're going to look at seven different locations on planet Earth, one on each of the continents of the world. ³ We can use our new skills to practice classifying a few of the animals that live in each place.



← Show image 9A-2: Sonoran Desert

4 [Point to the southwestern desert area of the United States on a world map or globe.]

First stop, the American desert! ⁴ Here are some examples of animals you may find in this North American desert: the western diamondback rattlesnake, the Gila [HEE-luh] woodpecker, the desert bighorn sheep in the background, the roadrunner, the banded Gila monster, the bobcat, and the turkey vulture. Just by looking at these animals, are you able to classify them? The bobcat and the sheep are both covered in fur, so we know they are mammals. What about

the Gila monster? It's a reptile, one of only two venomous lizards in America. What kind of animal is this rattlesnake, which is also covered in scales? Yes, it is a reptile—it is venomous as well, and it is one of the few reptiles that gives birth to live young.



← **Show image 9A-3: Rainforest**

5 [Ask a student to point to the Amazon Rainforest in South America on a world map or globe.]

Great job! Let's move on to the Amazon Rainforest in South America.⁵ Native to the rainforest are the spotted jaguar, the green anaconda, the three-toed sloth, the red-bellied piranha, the blue-and-yellow macaw, the pink-toed tarantula, and the caiman, which looks like a small crocodile. The anaconda and the caiman are both covered in scales. The bird should be an easy one to spot—the only one with wings and feathers is the macaw. And the piranha should be familiar to all of you—these are Paolo's fish relatives. The jaguar and sloth both belong to the same group. Who can name that group?⁶ Great—they're mammals; we can tell because they are covered in fur. As you have learned, mammals give birth to live babies. Does this dark, hairy spider belong to one of the vertebrate groups we've studied? No, the pink-toed tarantula is an invertebrate. It's cold-blooded, has an exoskeleton, and is a member of the arachnid group.

6 [Pause for students to share.]



← **Show image 9A-4: Alpine mountains**

7 [Point to the Alps region of Europe on a world map or globe.]

8 [Point out the birds in the background, and pause for students to share.]

9 [Pause for students to share.]

Let's look at some of the animals that make their homes high in the **Alpine** mountains of Europe.⁷ What do you see in the background, there on the rocks?⁸ The rock ptarmigan [TAHR-mi-guhn] lives in the Alps. So does the black Alpine salamander, the marmot, the golden eagle, the Apollo butterfly, and the pine marten. Which one do you think is not a member of any of the vertebrate groups we've studied?⁹ Yes, the butterfly is an invertebrate, and is classified in the largest group of animals on Earth: insects! The black Alpine salamander shares characteristics with both a lizard and a frog. Think about how you would classify it. It's a moist-skinned amphibian, but an unusual one that lives only on land and gives birth to fully developed live young. What two-legged, feathered animals do you see?¹⁰ Yes, the birds pictured are the ptarmigan and the golden eagle. And mammals—are there any fur-covered creatures in the Alps? Yes, the marmot and the pine marten.

10 [Pause as a student points.]



← **Show image 9A-5: The Ganges Delta**

11 [Point to the Ganges River and its delta on a world map or globe.]

12 [Pause as a student points.]

13 [Pause as a student points.]

The Ganges [GAN-jeez] **Delta** of India, on the continent of Asia, is home to swamps, forests, and creeks.¹¹ The animals that live there include the black-crowned night heron, the wild boar, the Olive Ridley turtle, the Ganges River dolphin, the Indian python, the blue-eared kingfisher, the mugger crocodile, and the chital. Can you spot the cold-blooded reptiles here?¹² You bet—the crocodile, the turtle, and the python are all representatives of the reptile group. Which ones are warm-blooded mammals?¹³ Yes, the boar, or wild pig, and the chital, a common deer of the area. The polluted waters of the Ganges River have ruined the habitat for a number of animals, and this river dolphin is endangered because of the river’s pollution. Only one of four river dolphin species in the world, it is a mammal just like its ocean-loving relatives. The Ganges river dolphin is sometimes called the blind dolphin; each of its eyes lacks a lens to give it clear vision, but it still uses its eyes to help it find direction. And, of course, our feathered friends of the sky—the kingfisher and the heron—are both birds.



← **Show image 9A-6: African savanna**¹⁴

14 [Have a volunteer point to the continent of Africa on a world map or globe.] One-fifth of the African continent is covered by the hot, dry grasslands of the African savanna.

15 [Pause for students to share.]

I bet you’ve seen pictures of the many large game animals that make their homes in the savannas of Africa. They include the giraffe, the elephant, the hyena, the wildebeest, the lion, the zebra, and the impala. All of these animals belong to the same group of vertebrate animals. What are they?¹⁵ Yes, mammals! Birds, like the hornbill and the quelea [KWEE-lee-uh], live there as well. And venomous reptiles, snakes like the gaboon and the black mamba, are deadly to their prey in the savannas.



← **Show image 9A-7: Coral reef**

16 The Great Barrier Reef is the largest coral reef, or ridge in a shallow ocean area, in the world. It is on the northeast coast of the continent of Australia. [Point to this area on the world map.]

17 [Pause for students to share.]

The Great Barrier Reef of Australia is home to many different sea animals.¹⁶ Animals here include the bottlenose dolphin, the anemonefish, the blue spotted stingray, the box jellyfish, the black-tipped reef shark, and the leatherback sea turtle. Is the jellyfish a fish? Who remembers?¹⁷ No, in spite of its name, the jellyfish is an invertebrate and has no gills. Be sure to notice the jellyfish’s

many long **tentacles**. So, do you think the anemonefish is a fish or not? Yes, it is indeed a fish, also called the clown fish because of its colorful markings, and it lives among the tentacles of another invertebrate, the sea anemone. The sea turtle belongs to the reptile group, and you probably remember that the dolphin is a milk-producing mammal that breathes with its lungs. How about the shark?¹⁸ Yes, it is a fish too. It breathes through gills, and unlike the dolphin, does not provide milk for its young. And the stingray? A fish, too—a relative of the shark.

18 [Pause for students to share.]

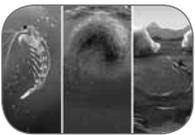


← **Show image 9A-8: Antarctic ice shelf**

19 [Ask a student to point to Antarctica on the world map.]

Finally, let's look at Antarctica, the southernmost continent and one of the coldest places on Earth.¹⁹ Emperor penguins live in its icy waters, along with blue whales and humpback whales. Leopard seals, skua, and snow petrels spend half the year in darkness in this frozen coastal region. Only two vertebrate animal groups are found on the land in Antarctica. What are they?²⁰ That's right, mammals and birds. You learned that these two groups also share another common characteristic as well. Mammals and birds are both warm-blooded. The energy in the food they eat is used to warm their bodies and keep them from freezing.

20 [Point to the land animals. Pause for students to share.]



← **Show image 9A-9: Krill in the Antarctic**

These Antarctic animals survive in harsh frozen conditions, and they are largely dependent on krill, tiny shrimp-like crustaceans with exoskeletons that live in the waters beneath the ice packs. They are the primary, or main, source of food for the predators of Antarctica.

As you can imagine, living in the extreme cold of Antarctica presents a major challenge to cold-blooded animals. A few fish have adapted in an interesting way to survive in the cold waters surrounding Antarctica. The icefish has a special chemical in its body that acts like an **antifreeze** and keeps it from freezing!

A few invertebrates have found other interesting ways to survive the cold temperatures of Antarctica. Some mites survive by living in the fur of mammals or in the feathers of birds, close to the warmth of their warm-blooded **hosts**. Now you've seen a sample of the animals that live on each of the seven continents.



← **Show image 9A-10: Rattenborough waving good-bye**

There are so many interesting facts about Earth's animals! Before I go, let's each share one interesting fact that you have learned about vertebrate animals. Think for a moment about the interesting fact that you wish to share.²¹ Turn to your neighbor and share your vertebrate fact.

It's been so much fun for me to be with you again. I'm so proud of all that you've learned about the animal kingdom over the past few days. I'll look forward to seeing you again soon. In the meantime, I encourage you to keep your eyes open. As you see an animal or read about an animal, think about how you would classify it. Next time we're together, perhaps you can tell me about your discoveries. Until then, goodbye!

21 [Pause for students to think.]

Discussing the Read-Aloud

20 minutes

Comprehension Questions

15 minutes

Note: Fill in the Classification Chart where appropriate as you move through the comprehension questions. If students bring up a pattern-breaker or local animal in their responses, be sure to include that in the appropriate column/row.



← **Show image 9A-2: Sonoran Desert**

1. *Inferential* You heard that the Sonoran Desert is found on the continent of North America. Two of the animals shown in this illustration are venomous, the western diamondback rattlesnake and the banded Gila monster. To which vertebrate group do they belong? (reptiles) Based on what you can see in the image, how do you know they are not amphibians? (They do not have thin or moist skin; they have dry scaly skin.)
2. *Inferential* How do you know the roadrunner is not a reptile? (It has feathers and wings; it does not have scaly skin.)



← **Show image 9A-3: Rainforest**

3. *Inferential* You learned about the Amazon Rainforest which is found on the continent of South America. Two animals shown, the spotted jaguar and the three-toed sloth, are mammals. Based on what you see, how do you know they are mammals? (They have fur.) Is the pink-toed tarantula that lives in this ecosystem a vertebrate or an invertebrate? (invertebrate) Why do you think so? (It has an exoskeleton, which means it has no internal backbone; it has eight legs, which means it is an arachnid.)



← **Show image 9A-4: Alpine mountains**

4. *Evaluative* This illustration shows the Alpine mountains on the continent of Europe. What does *Alpine* mean? (*Alpine* refers to something related to the Alps, or something at a high altitude above the treeline.) The black Alpine salamander's method of reproduction makes it a pattern-breaker. How is its reproduction process different from other amphibians? (It lives its entire life on land and gives birth to live babies; other amphibians lay eggs in wetlands and live part of their lives in water.)



← **Show image 9A-5: The Ganges Delta**

5. *Inferential* Shown here is the Ganges River Delta in India, on the continent of Asia. What is a delta? (a fan-shaped area where a river flows into a bigger body of water) Point to the animals shown in the illustration that are warm-blooded. (all birds: black-crowned night heron, blue-eared kingfisher; all mammals: wild boar, Ganges River dolphin, chital) How do you know? (They are birds and mammals; all birds and mammals are warm-blooded.)



← **Show image 9A-6: African savanna**

6. *Inferential* You learned about large game mammals that live in the savanna on the continent of Africa. To which other vertebrate group do the venomous gaboon and black mamba belong? (reptiles) What characteristics of this group do they have? (They are cold-blooded and have dry, scaly skin.)



← **Show image 9A–7: Coral reef**

7. *Inferential* In the read-aloud, you learned about the Great Barrier Reef, along the coast of the continent of Australia. You learned about the special body parts that two invertebrates have—the sea anemone and the box jellyfish. What are these special body parts called? (tentacles) Two of the animals shown are the black-tipped reef shark and the blue spotted stingray. To what vertebrate group do they belong? (fish) What other characteristics classify fish as fish? (They are fully aquatic; they breathe through gills; they have skeletons made of cartilage.)



← **Show image 9A–8: Antarctic ice shelf**

8. *Literal* You learned about some of the animals that live on the ice shelves of Antarctica, the Earth’s southernmost continent. Which two groups of warm-blooded animals are well-represented in the cold Antarctic? (birds, mammals) There is a special word to describe the mammals and birds that small, cold-blooded invertebrates like mites depend on for food as well as warmth in the very cold temperatures of Antarctica. What is this word? (*host*)
9. *Literal* What special chemical does the icefish have in its body that helps keep it from freezing? (a chemical that acts like antifreeze)

I am going to ask some questions. I will give you a minute to think about the questions, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

10.  *Evaluative Think Pair Share:* Imagine you are a scientist studying a newly discovered animal. What kinds of things would you look for to decide how to classify it? (cold-blooded/warm-blooded, vertebrate/invertebrate, what kind of skin it has, where it lives, what it looks like, how it reproduces and feeds its young) Do you think it would be easy or hard to classify a new animal? Why? (Answer may vary, but students should use examples from the text.) If you were the author of these read-alouds, how do you think your point of view and presentation of the information would be similar to and different from Rattenborough’s? (Answers may vary.)
11. After hearing today’s read-aloud and comprehension questions and answers, do you have any remaining questions?

 You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Tentacles

5 minutes

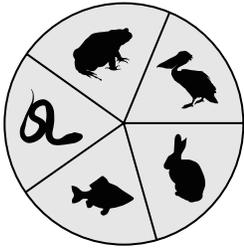
1. In the read-aloud you heard, “. . . the clown fish . . . lives among the *tentacles* of another invertebrate, the sea anemone.”
2. Say the word *tentacles* with me.
3. Tentacles are long, flexible body parts that stick out around the head or mouth and are used for feeling or grasping. Plants can also have tentacles.
4. The mouth opening of a jellyfish is surrounded by its tentacles, which help capture its food. The hair-like tentacles of a sundew plant produce a sticky glue which attracts insects; the tentacles then bend inward, and the sides of the leaf roll together and trap the insect prey.
5. Have you ever seen the tentacles of an animal or plant? Where were you? Be sure to use the word *tentacles* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I saw the tentacles on a . . .”]
6. What is the word we’ve been talking about? What part of speech is the word *tentacles*?

Use a *Sharing* activity for follow-up. Directions: Think about a plant or animal that you have seen that has tentacles. Take a moment and picture its characteristics in your mind. Is it in the animal kingdom or the plant kingdom? How many tentacles does it have? What do its tentacles look like? What are they used for? Turn to a classmate and tell about the plant or animal you are envisioning. Be sure to use the word *tentacles* in a complete sentence and describe some of the characteristics of the organism you are picturing.

Note: You may wish to have students draw an illustration with a caption and place it in their Classification Journals, sharing with the class as time allows.



Complete Remainder of the Lesson Later in the Day



Vertebrate Animals Around the World

9_B

Extensions

20 minutes



Writing an Informational Paragraph: Draft/Revise (Instructional Masters 8B-2, 9B-1, and 9B-2)

Give students their copies of Instructional Master 8B-2. Remind students that they have completed the planning and drafting step of the writing process and that today they are going to complete the revising step.

Have students reread their drafts. Tell students that they are going to use a Revision Checklist to help them to know what other changes need to be made to the paragraph. Ask, “Who can tell me what *revise* means?” Remind students that the word *revise* means *change* and is a substep of the drafting step. Remind students that writers often revise many, many times before they are able to call their final manuscript “finished.” Remind students that revising is somewhat different from editing: revising often includes making changes to the content and/or the order of the content, whereas editing often includes making corrections to grammar, punctuation, and spelling according to the rules of standard English. Tell students that they will complete the editing step the next time you meet to work on writing.

Copy Instructional Master 9B-1 onto chart paper, a chalkboard, or a whiteboard and read it aloud to students. Have students look at their drafts again and answer the questions on the Revision Checklist to see if there are any necessary content revisions to be made to their paragraphs.

Remind students that in the opinion paragraph they wrote together in the *Classic Tales: The Wind in the Willows* domain, their supporting example sentences were in chronological order because they followed the plot of the story. Explain that with an informational paragraph, sometimes the sentences may be rearranged to flow better. You may wish to write the supporting sentences onto strips and move them around to see which order helps the paragraph flow best.

Once revisions have been decided upon, remind students that the last substep of the drafting step is to rewrite a second draft of their paragraphs, incorporating the changes made during the revision substep.

Give students a copy of Instructional Master 9B-2. As students rewrite their paragraphs, remind them to use capital letters at the beginning of their sentences, appropriate punctuation at the end, and commas between things in a series.

Have students think more about a title. Tell them that they may wish to write a title at the top of their second drafts, but that they may keep thinking about other title ideas. Tell students that they will complete the next step of the writing process—editing—the next time you meet to work on writing together, and that they may decide on a final title then.

Note: You may wish to model this step of the writing process for some students who are not ready to complete it independently. You may also wish to have students work with partners or in groups, especially when completing the Revisions Checklist.

You may wish to show Image Card 23 (Frisled Dragon) and share this sample informational paragraph in its entirety.

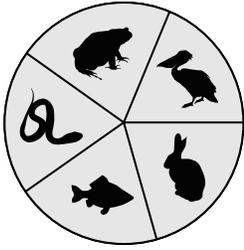
“The Coolest Animal Group”

Frisled dragons, one of my favorite animals, are classified by scientists as reptiles. First, they are grouped in the reptiles group because they are cold-blooded. Because frilled dragons do not have a source of internal heat, like you and I do, they need a source of external heat, such as the sun or a heat lamp. Another reason frilled dragons are in the reptile group is that they lay eggs instead of giving birth to live young. Reptiles are also vertebrates, which is why they are grouped together into one group. Finally, frilled dragons have scaly skin like other reptiles, instead of fur or feathers. These are the reasons that frilled dragons are categorized as reptiles, and I hope to have one of these awesome reptiles as a pet someday!

Note: This is the last read-aloud of this domain. Refer to the recommended schedule in the Introduction to guide you in planning the remaining days of this domain. The editing and publishing steps of this informational writing piece are in Pausing Point 2. **It is highly recommended that you regard this first part of Pausing Point 2 as required in order to most accurately align with the writing requirements of the Common Core State Standards.**

During these writing sessions, some students may also have the opportunity to choose another animal and write an additional

informational paragraph using the formal writing process. Refer to the writing instruction and Instructional Masters in Lessons 8 and 9 to guide you in this process. Some students may work with partners, in groups, or in direct conference with you.



Pausing Point 2

PP₂

Note to Teacher

Your students have now heard all the read-alouds of the *Classification of Animals* domain. It is highly recommended that you pause here and spend two days reviewing, reinforcing, or extending the material taught thus far.

You may have students do any combination of the activities listed below. The activities may be done in any order. You may wish to do one activity on successive days. You may also choose to do an activity with the whole class or with a small group of students who would benefit from the particular activity.

Core Content Addressed in This Domain

Students will:

- ✓ Observe and describe basic characteristics of an animal
- ✓ Explain that scientists classify animals by common or shared characteristics
- ✓ Explain that scientists classify animals in order to study them and show relationships
- ✓ Identify cold-blooded/warm-blooded and vertebrate/invertebrate as important characteristics used to classify animals
- ✓ Describe basic characteristics of vertebrate/invertebrate animals
- ✓ Classify particular animals as vertebrates or invertebrates
- ✓ Describe basic characteristics of cold-blooded/warm-blooded animals
- ✓ Classify particular animals as cold-blooded or warm-blooded
- ✓ Identify fish, amphibians, reptiles, birds, and mammals as groups of vertebrates
- ✓ Identify basic characteristics of fish, amphibians, reptiles, birds, and mammals

- ✓ Classify particular animals as fish, amphibians, reptiles, birds, or mammals
- ✓ Compare and contrast two groups of vertebrates
- ✓ Identify insects as invertebrates
- ✓ Identify insects as the most numerous group of animals that have currently been identified
- ✓ Explain that there are a large number of animals that have not yet been identified
- ✓ Demonstrate familiarity with the poem “The Crocodile”

Activities

Writing an Informational Paragraph: Edit/Final Copy

Materials: Instructional Masters 8B-2, 9B-2, PP2-1, and PP2-2; chart paper, chalkboard, or whiteboard

Give students their copies of Instructional Masters 8B-2 and 9B-2. Remind students that they have completed the planning and drafting steps of the writing process and that today they are going to complete the editing step. Tell students that this is also the time to decide on a final title.

Tell students that they are going to use an Editing Checklist to help them know if any further corrections are needed. Explain that writers often edit their drafts many, many times before they are able to call their final manuscripts “finished.” Remind students that editing is somewhat different from revising; revising often includes making changes to the content and/or order of content, whereas editing includes making corrections to grammar, punctuation, and spelling according to the rules of standard English.

Copy Instructional Master PP2-1 onto chart paper, a chalkboard, or a whiteboard and read it aloud to students. Have students read their drafts and answer the questions on the Editing Checklist to know if they need to make any edits to their grammar, punctuation, or spelling.

Tell students that after editing and deciding on a title, the last substep before publishing their informational piece is to create a final copy. Give each student a copy of Instructional Master PP2-2. You may also wish to have students type this final copy now to reinforce keyboarding skills, including spell-check and dictionary and thesaurus functions, or you may choose to have them do this during the publishing step.

Tell students that they have now completed the editing step, including the substep of creating the final copy, and that they will complete the publishing step the next time you meet to work on writing. Explain that this means they are going to create a presentation of their final copies, possibly together with illustrations and/or other graphic aids, to display and share with others. Encourage students to be thinking of any illustrations they would like to include with their paragraphs during the publishing step.

Note: You may wish to model this step of the writing process for some students who are not ready to complete it independently. You

may also wish to have some students work with partners or in groups.

Writing an Informational Paragraph: Publish

Materials: Instructional Masters PP2-2 and PP2-3

Give each student a copy of Instructional Master PP2-2. Remind them that they have completed the editing step of the writing process for their informational pieces, including the substep of creating the final copy. Tell students that they will now complete the publishing step of the writing process. Explain that this means they will create a presentation of their paragraphs to share.

Remind students that they completed the publishing step together in a previous domain. Remind students that there are many ways to publish their writing. For example, some students may wish to use technology to add computer graphics such as illustrations, text boxes, and sidebars to aid in the presentation of information. Some students may wish to create a PowerPoint presentation. Other students may wish to create an artistic book format of their paragraphs—as excerpts or as a whole—perhaps with handwritten text and/or handmade illustrations.

Encourage students to be creative. You may wish to have students share their published paragraphs with the class, school, and/or community. You may also wish to use Instructional Master PP2-3 to assess students' formal writing.

Note: You may wish to model this step of the writing process for some students who are not ready to complete it independently. You may also wish to have some students work with partners or in groups.

Note: You may wish to have some students complete this step of the writing process on their own. All students may have the opportunity to write their own informational paragraphs during this last week of the domain.

Image Review

Show the images from any read-aloud again, and have students retell the read-aloud using the images.

Image Card Review

Materials: Image Cards 1–23

In your hand, hold Image Cards 1–23 fanned out like a deck of cards. Ask a student to choose a card but to not show it to anyone else in the class. The student must then perform an action or give a clue about the picture s/he is holding. For example, for a reptile, the student may give a clue like, “I am cold-blooded, have dry, scaly skin, and live mostly on land.” The rest of the class will guess what is being described. Proceed to another card when the correct answer has been given.



Domain-Related Trade Book or Student Choice

Materials: Trade book

Read an additional trade book to review a particular concept; refer to the books listed in the domain introduction. You may also choose to have students select a read-aloud to be heard again.

If students listen to a read-aloud a second time, you may wish to have them take notes about a particular topic. Be sure to guide them in this important method of gathering information. You may wish to model how to take notes, construct an outline, etc.

10 Riddles for Core Content

- I am a large group in the classification system that scientists use to classify living things. Two of my types are called Plant and Animal. What am I called? (a kingdom)
- I am an animal that eats mainly meat. What am I? (a carnivore)
- I am an animal that eats only plants. What am I? (an herbivore)
- I am an animal that eats both meat and plants. What am I? (an omnivore)
- I am the trip that birds and some other animals take when they move from one climate to another. What am I called? (migration)
- I am a cold-blooded animal that has rough, scaly skin. What am I? (a reptile)
- I am a vertebrate animal whose body is covered in feathers, has wings for flying, and lays eggs in a nest I make for my young. What am I? (a bird)

- I am an animal group that has hair or fur. The females in this group give birth to live babies and make milk in their bodies to feed their young. What animal group am I? (mammals)

Key Vocabulary Brainstorming

Materials: Chart paper, chalkboard, or whiteboard

Give students a key domain concept or vocabulary word such as *shed*. Have them brainstorm everything that comes to mind when they hear the word, such as *cast off*, *skin*, *grow*, *molt*, etc. Record students' responses on a piece of chart paper, a chalkboard, or a whiteboard for reference.

✈ Multiple Meaning Word Activity: Nest

Materials: Image of a cozy room or house

1. [Show image 7A-12.] In Lesson 7 you heard that, "Most birds are animals that prepare a nest, or shelter for their young using whatever materials are available to them in nature."
2. In this example, *nest* is a noun. A nest is a structure that provides a safe place to protect both eggs and baby chicks from harsh weather and animal predators. [Have a student point to the different types of nests shown in 7A-12 as you describe the types of nests shown.]
3. The word *nest* can also be a verb, along with *nested* or *nesting*, to describe the animal parents' behavior while creating the nest. Have you ever watched a bird build a nest? [Have a student point to the robins' nest in the upper left corner of the image.] What do you think this pair of robins did as they were nesting, or working to prepare their nest?
4. [Show a picture of a comfortable and cozy room in a house, perhaps a new baby's room.] The noun *nest* can also be used to describe a comfortable, cozy place that is safe and feels like home; the verbs *nest* or *nesting* can also be used to describe the actions of a person as they prepare a place to be comfortable and safe like a nest. Have you ever heard a mother who is expecting a baby described as nesting while she prepares her home for her new baby? Perhaps you have heard parents describe having an empty nest after their children have grown up and moved out of the house. How is the home like a nest?

Use a *Making Choices* activity for follow-up. Directions: I am going to read some sentences that have some form of the word *nest* in them. You might also hear other forms of the word, such as *nests*, *nested*, or *nesting*. If the sentence I read uses the word *nest* as a noun, you should say, “*Nest* is a noun.” If the form of the word *nest* is used as a verb, you should say, “*Nest* is a verb.” If *nest* or *nesting* is not used to describe a literal nest or making a literal nest, but used as a metaphor, you should also say, “*Nest* is a metaphor.”

1. The duck’s nest had seven eggs in it. (noun)
2. When the road worker started to cut down a dead tree, the startled crow stopped trying to nest in it. (verb)
3. Just before her puppies were born, our dog Pippa was busy nesting as she piled up soft socks and toys from around the house. (verb/ metaphor)
4. When Brittany’s older cousin left home for her new job, Brittany overheard her Aunt Janice say, “I have an empty nest now.” (noun/ metaphor)
5. The bald eagle nested in the top of the highest tree. (verb)
6. Male robins help bring materials to the nest, though the female robin does most of the nest building. (noun)
7. You may choose to share another way the word *nest* is sometimes used. Ask students if they have ever seen a set of objects that all have the same shape, but are different sizes, and that fit, or nestle, together in a way that makes them easy to stack. Share ideas, including nesting bowls, dolls, tables, baskets, etc.

Have students work with a partner to write their own sentences using different forms and meanings of the word *nest*. You may also wish to have them draw illustrations to portray the various meanings of the word.

Research Activity: Learning More About the Real Animals

Materials: Image Cards 1–5, 9, 10, 12, 13, 15, 16, and 23; Internet access; trade books; drawing paper; drawing tools

Give students the opportunity to research the following animal species that are displayed on the image cards. You may also want to make a list of all of the real animals portrayed in the flip book images of the seven ecosystems.

Refer to the list of trade books and websites in the introduction as sources. Encourage students to write about or make a poster displaying what they learn. Have students present their findings to a group or with the class.

- Red-Bellied Piranha
- Crested Forest Toad
- Green Anaconda
- Great White Egret
- Common Hippopotamus
- Gentoo Penguin
- Brown Trout
- African Elephant
- Australian Saltwater Crocodile
- Spotted Salamander
- Sand Lizard
- Frilled Dragon

If your students have already heard the *Classic Tales: The Wind in the Willows* domain, you may wish to connect back to the real animals represented in that story now that students have learned more about classifying animals by their characteristics. Students may research the classification, habitats, habits, diets, and other characteristics of rats, moles, toads, badgers, otters, stoats, ferrets, and weasels.

Carnivores, Herbivores, and Omnivores

Materials: Instructional Master PP2-2; research materials

Give each student a copy of Instructional Master PP2-2. Have them identify what the animals in each group eat, completing research as necessary to identify the animals/groups as carnivores, herbivores, or omnivores.

Bird Study

Materials: Books about local birds; bird feeder, bird food

You may wish to study some common local birds so that students recognize the birds in their area. Then, you may wish to hang a bird feeder near a classroom window so that students can observe this group of

animals feeding. Students may record their observations in a notebook.

Animal Groups Bulletin Board

Materials: Bulletin board; drawing paper, drawing materials; magazines

Tell the class or a group of students that together they are going to add to the animal groups bulletin board they created earlier to help them remember what they have learned in this domain. Have students brainstorm important information about the groups of animals they have learned. Have each student choose one idea to draw a picture of and ask him or her to write a caption for the picture.

Post students' drawings in the categories they describe. (Warm-blooded would go in the Mammals or Birds section, for example.) You may want to have more than one student draw/write about each concept.

Then, have students bring in images or cut out images of animals from each of the groups and post those onto the bulletin board as well.



Venn Diagram

Materials: Instructional Master PP2-4; chart paper, chalkboard, or whiteboard

Tell students that together you are going to compare and contrast two things or animals they have learned about by asking how they are similar and how they are different. Use Instructional Master PP2-4 to list two items or animals at the top of the diagram and to capture information provided by students. Choose from the following list, or create a pair of your own:

- insects and arachnids
- amphibians and reptiles
- birds and fish
- mammals and humans
- an object in the classroom and an organism outside the window

You may wish to create several copies of the Venn diagram to compare and contrast several things or animals. You may also wish to have students use these diagrams as brainstorming information for further writing.

- ✈ You may wish to have some students use Instructional Master PP2-4 to complete this activity independently.
- ✈ You may wish to have some students create a three-way Venn diagram to compare and contrast three things or animals, e.g., carnivores, omnivores, and herbivores; amphibians, reptiles, and birds; etc.

Observation and Inquiry: A Sorting Activity

Materials: Image Cards 1–23 (with Image Card 11 removed)

In your hand, hold Image Cards 1–23 fanned out like a deck of cards. Ask a student to randomly choose four of the cards and display them so all students can see the animals and their characteristics. Tell students that together you will be dividing the selected animal cards into two groups based on a characteristic that the group chooses.

Ask for a student to suggest a characteristic to use to sort the animals. For example, a student might suggest to sort the animals by the number of feet. Help students be clear about the characteristic that will be used; then discuss together how you would sort the four animal cards based on that characteristic.

Ask the students whether there is another characteristic that could be used to sort the animals. For example, the same set of animal cards could be sorted by whether the animals have hair or not; whether or not they live in water; or whether they eat plants.

As necessary, discuss with students if you have enough information to decide about each of the animals or characteristics. You may decide to reshuffle the animal image cards and repeat the exercise using a different combination of animal images.

✈ Create a Graphic

Materials: Poster 1 (Vertebrate and Invertebrate Graphic)

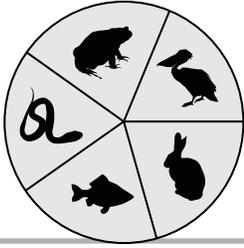
Have students create a different style of visual representation to show how many invertebrates there are on Earth compared to vertebrates, e.g., a pie graph, a bar graph, etc.

Writing Prompts

Students may be given an additional writing prompt such as the following:

- Some characteristics of a reptile (or fish, bird, or mammal) are . . .

- An invertebrate is . . .
 - A vertebrate is . . .
 - A mammal's covering is helpful because . . .
 - I know a bird is a warm-blooded vertebrate because . . .
 - The most interesting group of animals is . . . because . . .
 - Compare and contrast an egret and a hippopotamus.
 - Compare and contrast a snake and a lizard.
- ✈ Pretend you are a herpetologist and you have discovered a brand new species of animal. Describe the characteristics of the animal and how you would classify it based on those characteristics. Be sure to name this new animal!
- ✈ Imagine that you wake up one morning, and it is Morph Day! Animals in your neighborhood, pets, perhaps even family members, have morphed into different animal groups. Explain how the features that once classified one or a few of these animals into their correct groups have changed. Describe the changes and the new classifications based on these metamorphoses.



Domain Assessment

DA

This Domain Assessment evaluates each student's retention of the core content targeted in *Classification of Animals*.

10 Domain Assessment

Note: You may wish to have some students do the three parts of this assessment in two or three sittings. Some students may need help reading the questions. You may wish to allow some students to respond orally.

Part I (Instructional Master DA-1)

Directions: We will read each question and the optional answers together. Circle the letter that best answers the question.

1. Why do scientists classify animals? (D. all of the above)
2. Which is **not** a way that scientists classify animals into groups? (A. by how much they weigh)
3. How do some warm-blooded animals keep their body temperatures the same when their surroundings are cold? (D. migrating)
4. Which animal is **not** cold-blooded? (B. a mammal)
5. How are animals that have backbones classified? (A. as vertebrates)

Part II (Instructional Master DA-2)

Directions: We will read the top row and left column together. Then, you will fill in the blanks on the chart to tell more about the animals you have learned. The first row and some other parts have been completed for you.

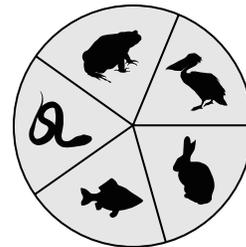
1. Fish (CB)
2. Fish (VB)
3. Amphibians (CB)
4. Amphibians (VB)
5. Reptiles (VB)
6. Reptiles (dry, scaly skin)
7. Birds (VB)
8. Birds (feathers)
9. Mammals (WB)
10. Mammals (fur/hair)

Part III (Instructional Master DA-3)

Directions: Write one or two sentences to answer each question.

1. Are there more warm-blooded or cold-blooded animals in the five groups of animals you learned about?
2. How would you compare and contrast warm-blooded and cold-blooded animals?
3. How is a mammal's body covering helpful? List at least one of the two ways.
4. What are two interesting facts that you learned about animals?
5. In which animal group are humans classified? How do you know?

For Teacher Reference Only:
Copies of *Tell It Again! Workbook*



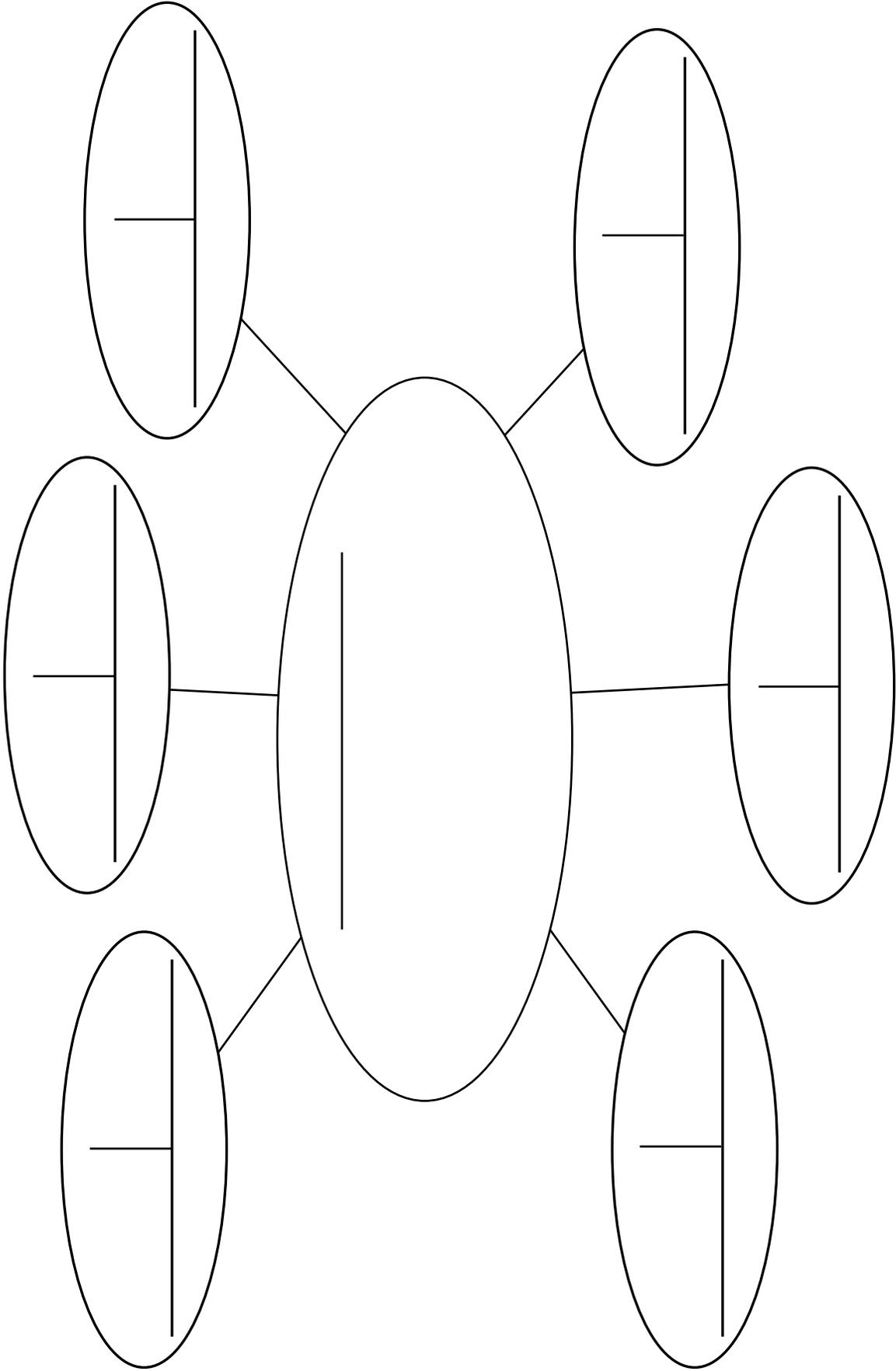
Name: _____

Directions: Follow your teacher's directions to fill in each category on the chart.

Animal Group	Insects	Fish	Amphibians	Reptiles	Birds	Mammals
Cold-Blooded or Warm-Blooded	cold-blooded					
Vertebrate or Invertebrate	invertebrate					
Body Design	exoskeleton					
Habitat	on land, in water, underground					
Reproduction	Most lay eggs.					
Pattern-Breaker	aphids (Some give birth to live young.)					
Local Animals						

Name: _____

Directions: Write the type of animal you are observing on the line in the central oval. Write word pairs (an adjective and a noun) describing the animal on the lines in the surrounding ovals. Draw a picture of the animal in the central oval and/or on the back of this worksheet.





Dear Family Members,

Over the next several days, your child will be learning about the classification of animals. Your child will learn about five main groups of animals, all of which have backbones: fish, amphibians, reptiles, birds, and mammals. In addition, your child will learn that in order to classify animals, scientists look at characteristics such as whether they are cold-blooded or warm-blooded, and whether they are vertebrates or invertebrates. Your child will also hear about insects, the largest group of animals on Earth. Your child will hear that insects are one of many groups of invertebrates.

Below are some suggestions for activities that you may do at home to reinforce what your child is learning about the classification of animals.

1. Classify Your Home

In class, your child heard about different ways to classify things, such as objects, information, shapes, musical instruments, and school subjects, similar to how taxonomists classify animals. Ask your child to classify items in an area of your home. For example, you may work with your child to classify a group of books. Encourage your child to think of different criteria for classifying the books, such as by genre, hardcover/paperback, size, etc. This activity may help your child hone his or her skills in identifying characteristics, patterns, and relationships among things.

2. Groups of Animals

Ask your child to tell you the five groups of animals about which they are learning (amphibians, mammals, birds, fish, and reptiles). Be sure to ask about the mnemonic s/he has learned to help remember these groups: “**All My Best Friends Represent Vertebrates!**” Ask if there is one group of animals s/he is most interested in learning more about, and why. Your child may also wish to draw a picture of this animal/group.

3. Words to Use

Below are several of the words that your child will be learning about and using. Try to use these words as they come up in everyday speech with your child.

- *classify*—We can classify our books to make them more organized.
- *warm-blooded*—Because humans are warm-blooded, we use the energy from the food we eat to keep a constant body temperature.
- *bask*—My bearded dragon likes to bask in the sun on a warm day.
- *huddle*—Let's huddle together, because I'm cold!
- *spine*—My cat Frisky's flexible spine curves when she arches her back.

4. Read Aloud Each Day

It is very important that you read with your child each day. Set aside time to read to your child and also to listen to your child read to you. I have attached a list of recommended trade books related to the classification of animals that may be found at the library, as well as informational websites.

Be sure to praise your child whenever s/he shares what has been learned at school.



Recommended Resources for Classification of Animals

Trade Book List

1. *About Amphibians: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 2001) ISBN 1561453129
2. *About Birds: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 1997) ISBN 1561451479
3. *About Fish: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 2002) ISBN 1561453358
4. *About Mammals: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 1999) ISBN 1561451746
5. *About Reptiles: A Guide for Children*, by Cathryn Sill (Peachtree Publishers, 1999) ISBN 1561452335
6. *Amphibians*, by Melissa Stewart (Children's Press, 2001) ISBN 0516259504
7. *Amphibians: Water-to-Land Animals*, by Laura Purdie Salas (Picture Window Books, 2009) ISBN 9781404855212
8. *Animals Called Fish*, by Kristina Lundblad & Bobbie Kalman (Crabtree Publishing Company, 2005) ISBN 0778722198
9. *Animals with Backbones*, by Keith Pigdon (National Geographic Society, 2003) ISBN 0792242688
10. *The Beauty of the Beast: Poems from the Animal Kingdom*, by Jack Prelutsky (Alfred A. Knopf, Inc., 1997) ISBN 0679970584
11. *The Bird Alphabet Book*, by Jerry Pallotta (Charlesbridge, 1987) ISBN 0881064513
12. *Birds*, by Terry Jennings (QEB Publishing, Inc., 2009) ISBN 9781595667588
13. *Birds*, by Melissa Stewart (Children's Press, 2001) ISBN 0516259547
14. *Birds: Winged and Feathered Animals*, by Suzanne Slade (Picture Window Books, 2009) ISBN 9781404855229
15. *Can You Tell a Skink from a Salamander?*, by Anna Claybourne (Heinemann-Raintree, 2005) ISBN 9781410919670
16. *Classification Clues*, by Catherine Stephens (National Geographic Society, 2004) ISBN 0792245768
17. *Desert Mammals (True Books: Animals)*, by Elaine Landau (Children's Press (CT), 1997) ISBN 9780516260976

18. *Fish: Finned and Gilled Animals*, by Suzanne Slade (Picture Window Books, 2009) ISBN 9781404855236
19. *Forest Mammals*, by Bobbie Kalman (Crabtree Publishing Company 1987) ISBN 9780865051652
20. *The Frog Alphabet Book*, by Jerry Pallotta (Charlesbridge, 1990) ISBN 0881064629
21. *Fun With Nature*, by Mel Boring (Cooper Square Publishing LLC, 1998) ISBN 9781559717021
22. *The Furry Animal Alphabet Book*, by Jerry Pallotta (Charlesbridge, 1991) ISBN 0881064645
23. *Grassland Mammals (True Books: Animals)*, by Elaine Landau (Children's Press (CT), 1997) ISBN 9780516260990
24. *The Kids Guide to Zoo Animals*, by Michelle Gilders (Red Deer Press, 2004) ISBN 0889953015
25. *Kingdoms of Life: Classification (Come Learn with Me)*, by Bridget Anderson (Lickle Publishing, 2003) ISBN 9781890674175
26. *Mammals*, by Loredana Agosta and Anne McRae (McRae Books, 2008) ISBN 9788860980472
27. *Mammals: Hairy, Milk-Making Animals*, by Laura Purdie Salas (Picture Window Books, 2009) ISBN 9781404855250
28. *Many Creatures: A Song About Animal Classifications*, by Laura Purdie Salas (Picture Window Books, 2010) ISBN 9781404857636
29. *Mountain Mammals (True Books: Animals)*, by Elaine Landau Children's Press (CT), 1997) ISBN 9780516261096
30. *Outside and Inside Sharks*, by Sandra Markle (Aladdin, 1999) ISBN 9780689826832
31. *Oxford First Book of Animals*, by Barbara Taylor (Oxford Childrens, 2003) ISBN 9780199109852
32. *Peacocks, Penguins & Other Birds*, by Steve Parker (David West Children's Books, 2007) ISBN 0756518415
33. *Reptiles: Scaly-Skinned Animals*, by Laura Purdie Salas (Picture Window Books, 2009) ISBN 9781404855267
34. *Reptiles of All Kinds*, by Kelley MacAulay & Bobbie Kalman (Crabtree Publishing Company, 2005) ISBN 0778722163

Name: _____



35. *Small Mammals*, by Terry Jennings (QEB Publishing, Inc., 2009) ISBN 9781595667557
36. *The Snake Book*, by Mary Atkinson and Mary King Dorling (Kindersley Publishers Ltd., 1997) ISBN 9780751355659
37. *Temperate Forest Mammals (True Books: Animals)*, by Elaine Landau (Children's Press (CT), 1997) ISBN 9780516261157
38. *Tree Frogs, Mud Puppies & Other Amphibians*, by Daniel Gilpin (David West Children's Books, 2007) ISBN 0756518423
39. *Tropical Forest Mammals (True Books: Animals)*, by Elaine Landau (Children's Press(CT), 1997) ISBN 9780516261164
40. *Warm-Blooded or Cold-Blooded?*, by Bobbie Kalman (Crabtree Publishing Company, 2008) ISBN 9780778733010
41. *A Whale Is Not a Fish and Other Animal Mix-ups*, by Melvin Berger (Scholastic Inc., 1995) ISBN 0590474774
42. *What Is a Bird?*, by Bobbie Kalman (Crabtree Publishing Company, 1999) ISBN 086505892X
43. *What Is a Fish?*, by Bobbie Kalman and Allison Larin (Crabtree Publishing Company, 1999) ISBN 0865058946
44. *What Is a Mammal?*, by Bobbie Kalman (Crabtree Publishing Company, 1998) ISBN 0865058903
45. *What Is a Reptile?*, by Bobbie Kalman (Crabtree Publishing Company, 1999) ISBN 0865058938
46. *What is a Vertebrate?*, by Bobbie Kalman (Crabtree Publishing Company, 2007) ISBN 9780778732976
47. *What Is an Amphibian?*, by Bobbie Kalman and Jacqueline Langille (Crabtree Publishing Company, 2005) ISBN 0865059527
48. *What Is the Animal Kingdom?*, by Bobbie Kalman (Crabtree Publishing Company, 2005) ISBN 086505889X
49. *The Yucky Reptile Alphabet Book*, by Jerry Pallotta (Charlesbridge, 1989) ISBN 0881064548

Teacher/Family Resources

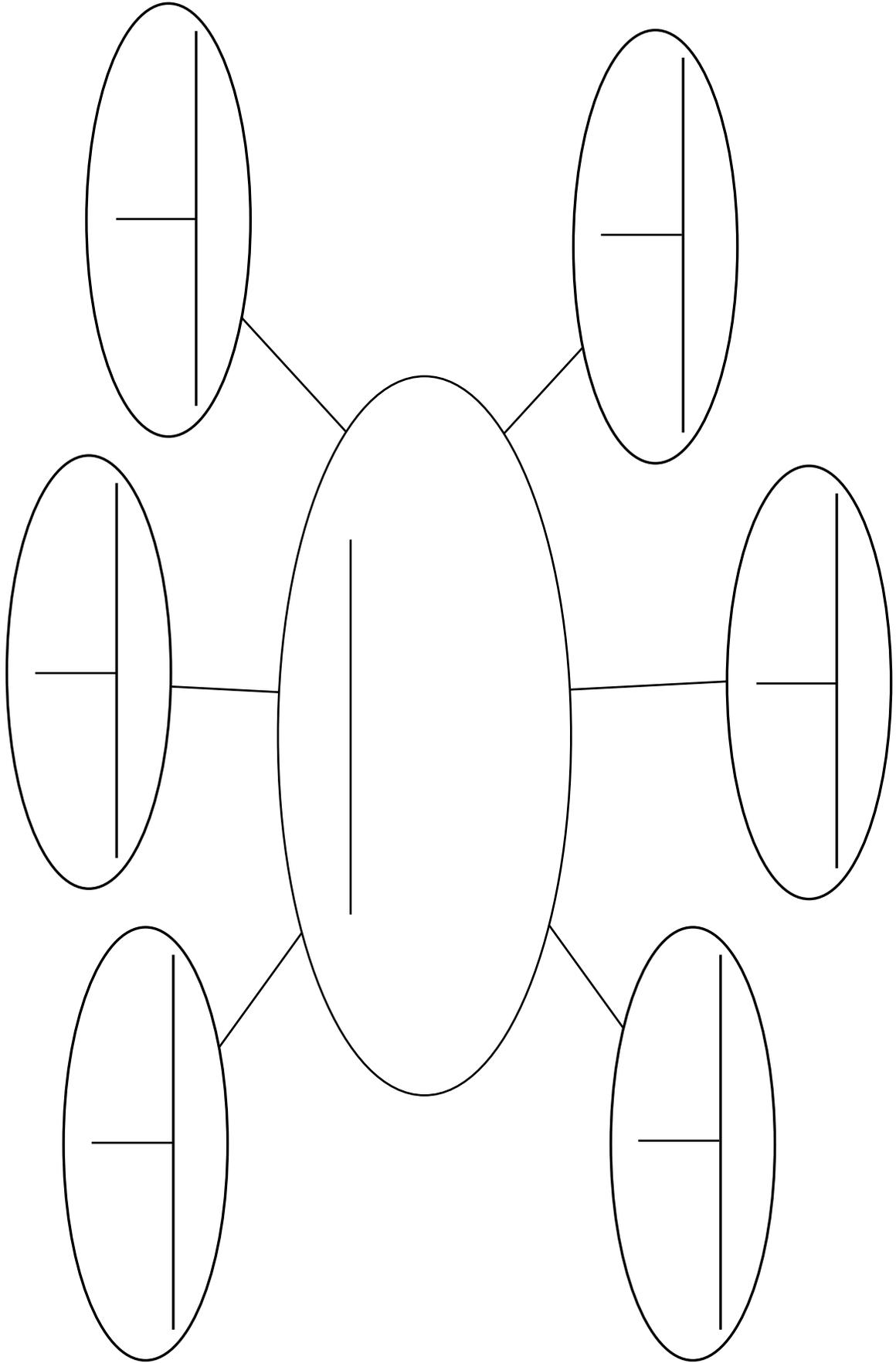
1. *Bill Nye the Science Guy: Mammals Classroom Edition (DVD)* (Disney Educational Productions, 2008) ISBN B001MEM7DG
2. *The Concise Animal Encyclopedia*, by David Burnie (Kingfisher, 2003) ISBN 9780753455906
3. *Eyewitness Video: Bird* (DK Publishing, 1994) ISBN 1564589145
4. *Life in Cold Blood (DVD)* (BBC Worldwide, 2008) hosted by David Attenborough ISBN 9780691137188

Websites

1. American Museum of Natural History: “OLOGY” for Kids and Families
<http://www.amnh.org/ology>
2. Animal Classification Practice
http://www.sheppardsoftware.com/content/animals/kidscorner/classification/kc_classification_main.htm
3. Discovery Kids
<http://kids.discovery.com/tell-me/animals>
4. Science Daily
<http://www.sciencedaily.com>
5. Smithsonian National Zoological Park: Animal Photo Gallery
<http://nationalzoo.si.edu/Animals/PhotoGallery>
6. Smithsonian National Zoological Park: Animal Species
<http://nationalzoo.si.edu/Animals/AnimalIndex/default.cfm>
7. Video Clips of Hundreds of Animals
<http://www.bbc.co.uk/nature/animals>

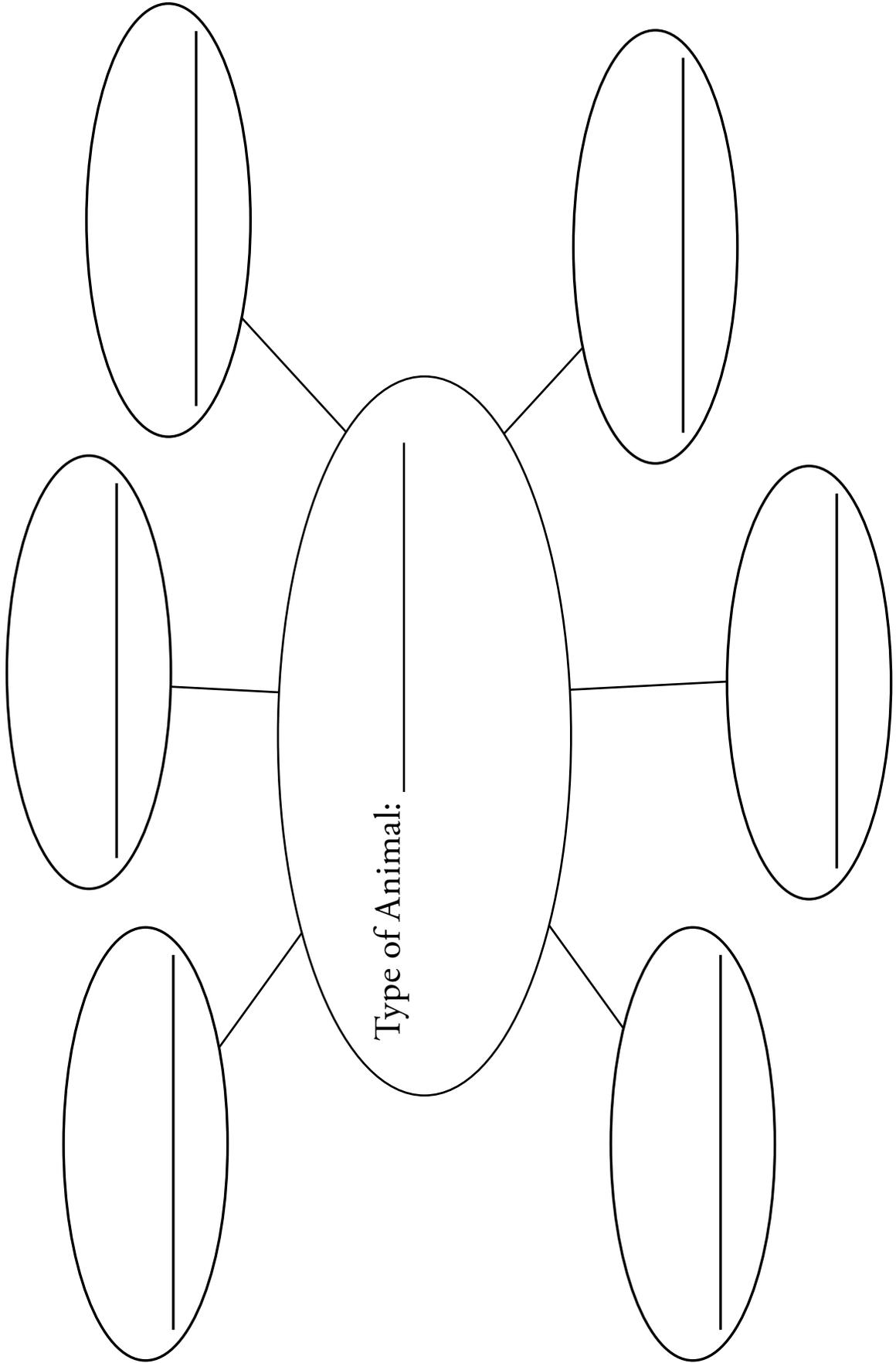
Name: _____

Directions: Write the type of animal you are observing on the line in the central oval. Write word pairs (an adjective and a noun) describing the animal on the lines in the surrounding ovals. Draw a picture of the animal in the central oval and/or on the back of this worksheet.



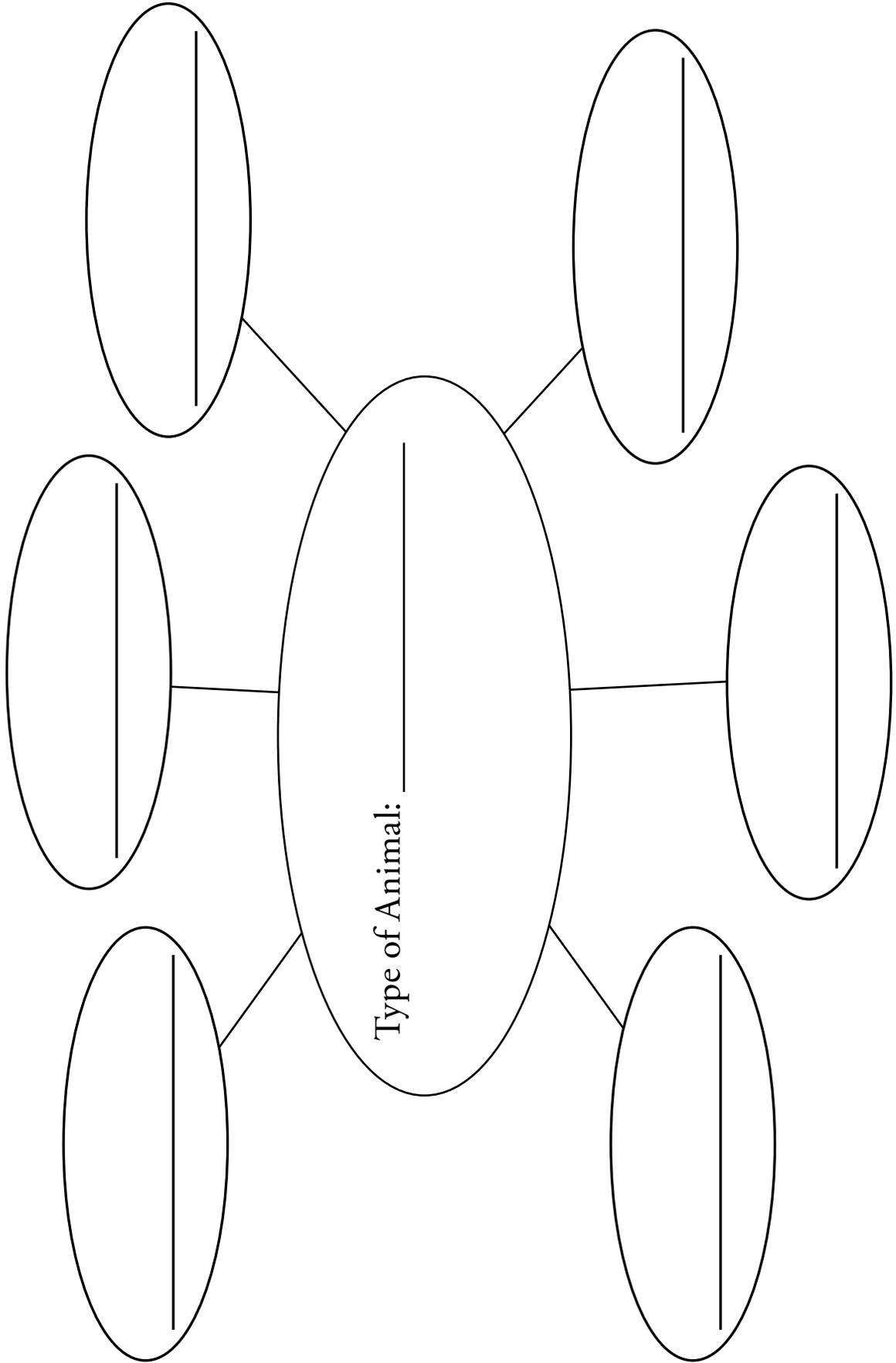
Name: _____

Directions: Write the name of the vertebrate animal group you learned about today in the central oval. Then, in each of the surrounding ovals, write words and/or phrases that describe the characteristics of animals in that group. Include in one of the surrounding ovals examples of animals in this group. In the center oval and/or on the back of this worksheet draw a picture of an animal in this group.



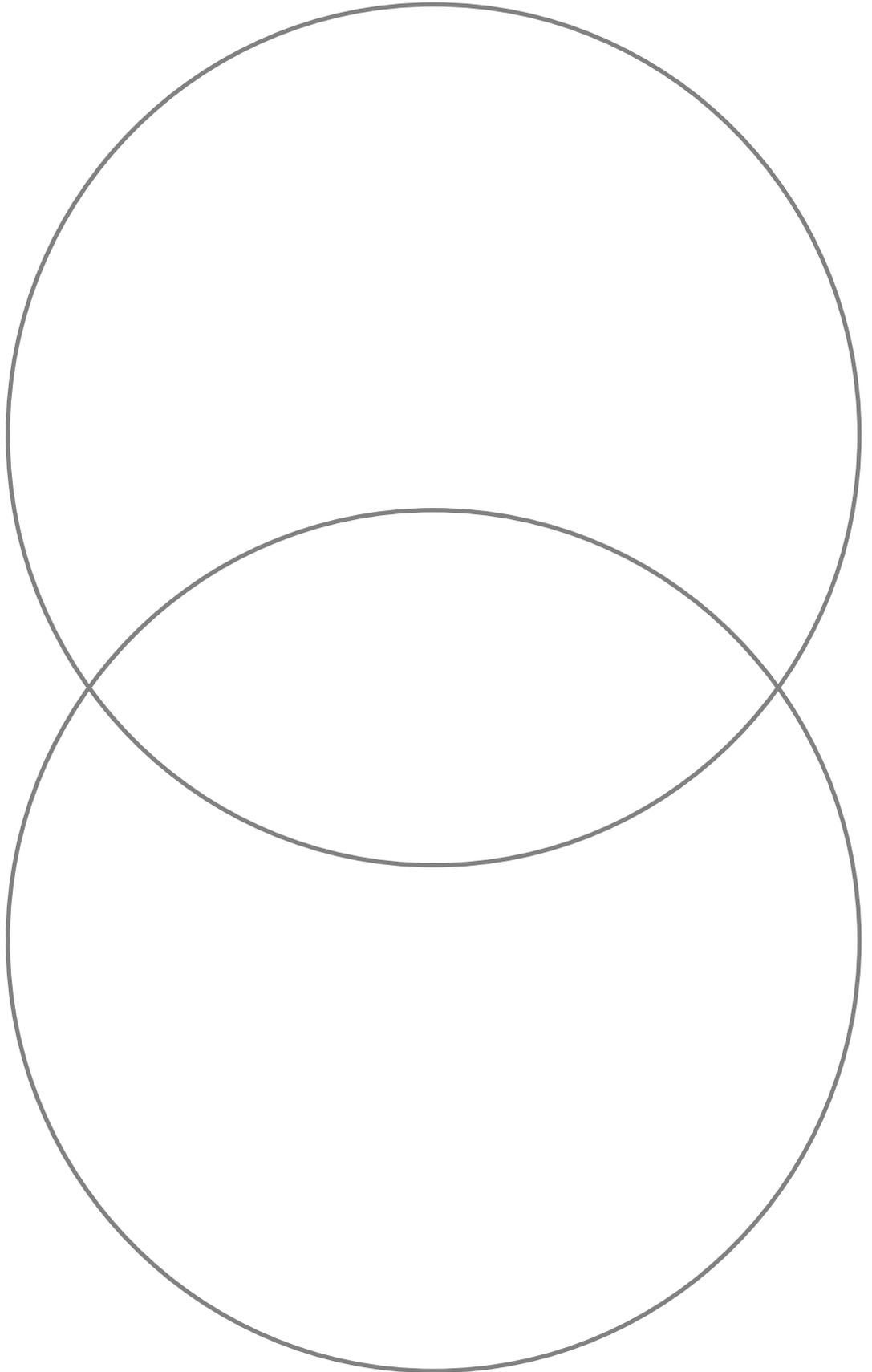
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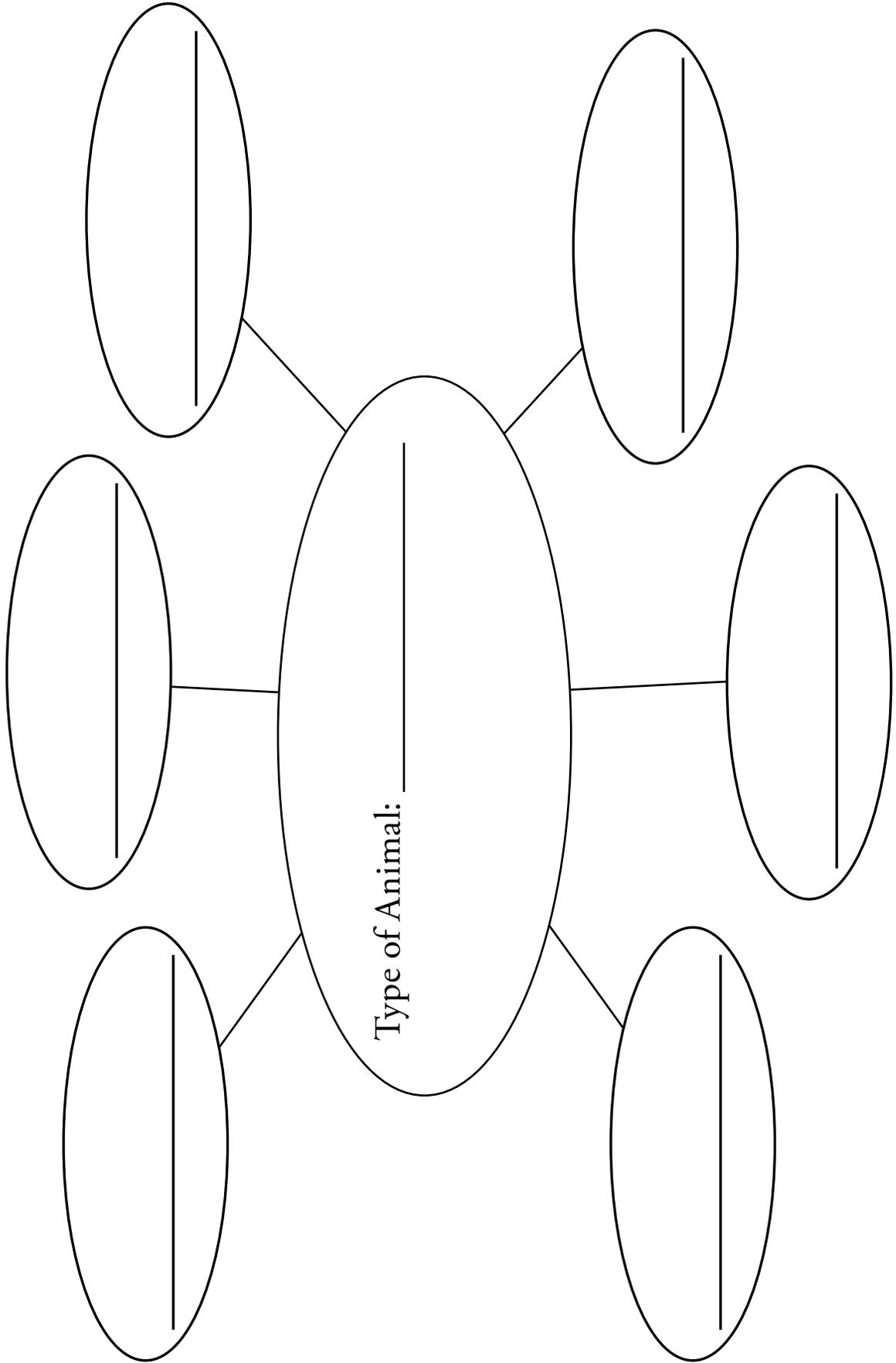
Name: _____

Directions: Write the two vertebrate groups you are comparing and contrasting on the two blanks. In the overlapping part of the diagram, write words and/or phrases that describe how the two things are alike. In the non-overlapping parts of each circle, write words and/or phrases that describe how the two things are different.



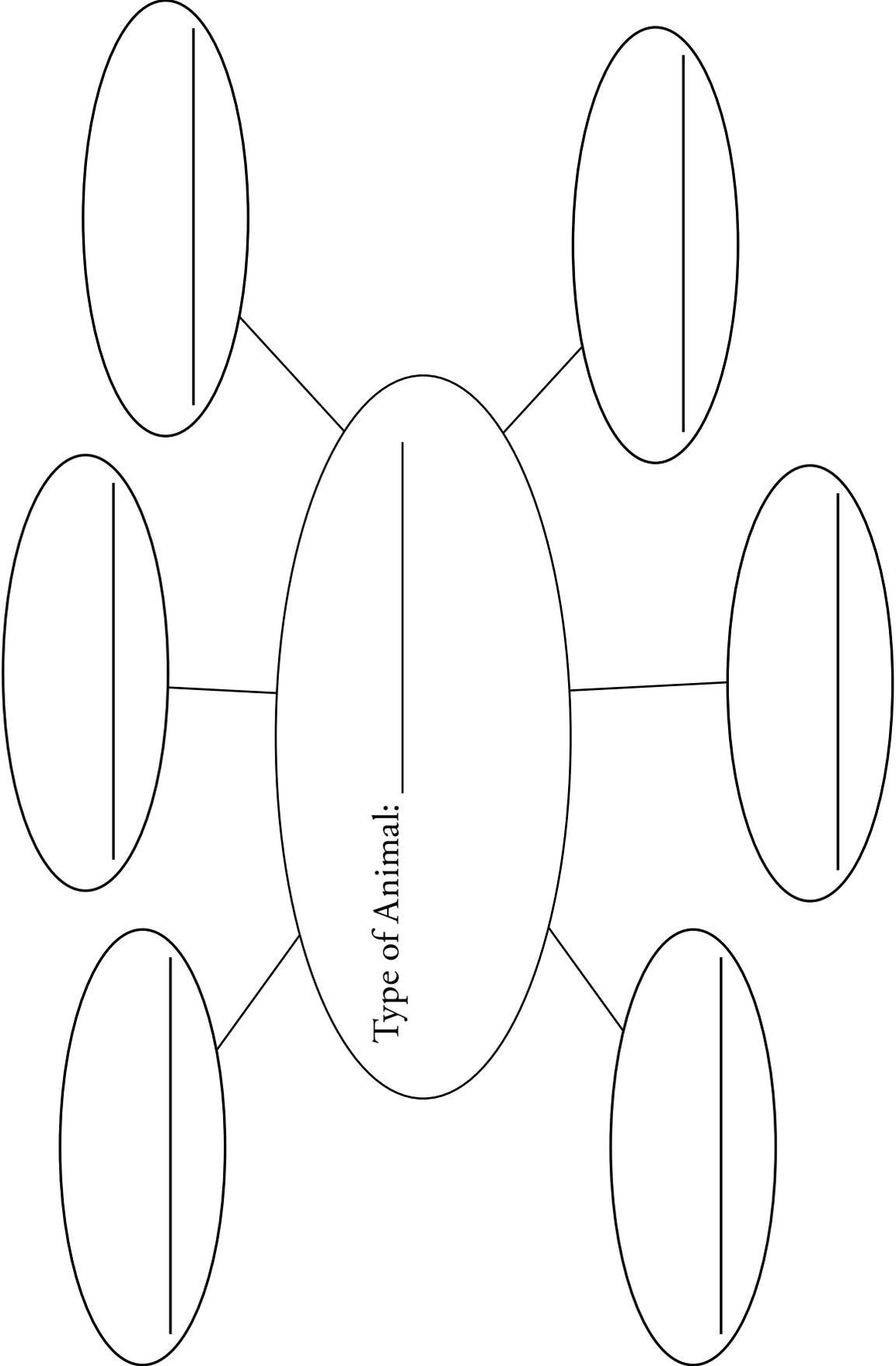
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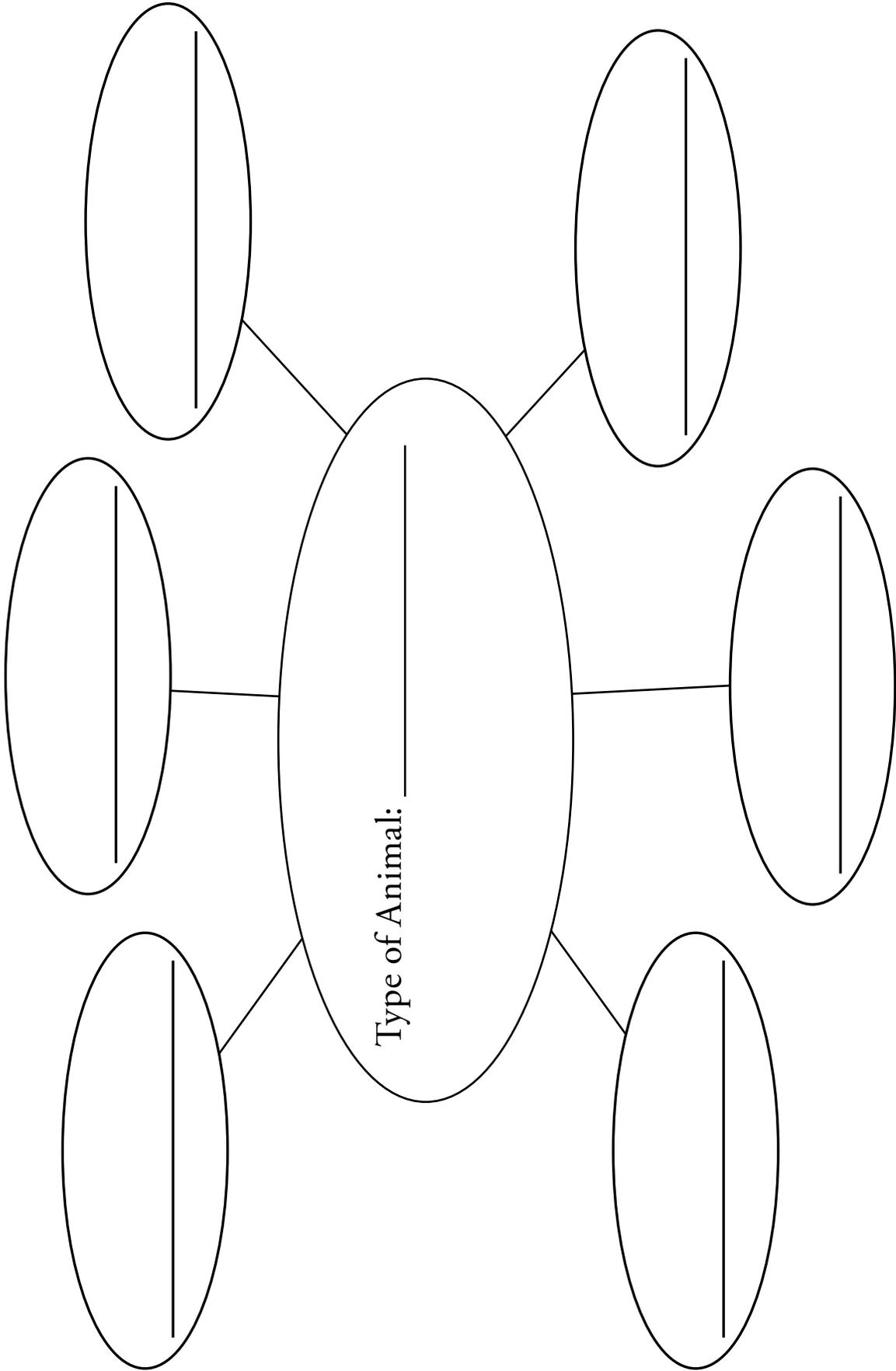
Name: _____

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Name: _____

Directions: Write the name of the vertebrate animal group you learned about today in the central oval. Then, in each of the surrounding ovals, write words and/or phrases that describe the characteristics of animals in that group. Include in one of the surrounding ovals examples of animals in this group. In the center oval and/or on the back of this worksheet draw a picture of an animal in this group.



Name: _____

Directions: Write your topic sentence in the first rectangle to introduce your animal and its group. Choose three supporting details to write in the next three rectangles to support or expand your topic sentence. Write your concluding sentence in the last rectangle to conclude your paragraph.

Topic Sentence**Supporting Detail #1****Supporting Detail #2****Supporting Detail #3****Concluding Sentence**



Dear Family Members,

Over the past couple of weeks, your child has been learning more about the classification of animals. S/he has learned about each of the five groups of vertebrate animals: fish, amphibians, reptiles, birds, and mammals. Your child has listened to several colorful and informative read-aloud stories. For each animal group, your child has learned whether it is cold-blooded or warm-blooded, whether it is a vertebrate or an invertebrate, and other important characteristics. In addition, your child will be observing [Lesson 9] beautiful illustrations of seven very different ecosystems on continents around the world. Your child has also had practice classifying vertebrate animals.

Below are some suggestions for activities that you may do at home to reinforce what your child is learning about the classification of animals.

1. Classify the Animal

Look through magazines or books that have pictures/illustrations of animals. Talk to your child about the things s/he notices about each animal, like whether it has a backbone (vertebrate) or no backbone (invertebrate), its body covering (fur or hair, scales, feathers), and whether it is cold-blooded or warm-blooded. Your child may want to create a collage of pictures of animals that belong to one of the vertebrate groups.

2. Animal Groups Drawing

Have your child draw a picture of one of the groups of animals (fish, amphibians, reptiles, birds, and mammals) s/he has learned about, with several examples of the kinds of animals included in the group. Talk with your child about one of these animals, how scientists classify this animal, and any other interesting facts.

3. Sayings and Phrases: The Show Must Go On

Discuss with your child what the saying “the show must go on” means. It was in use in the United States starting in about 1867, and likely originated with the

popularity of the circus. Despite tragic accidents, poor weather conditions, and other setbacks which might have meant cancellation, circus shows usually took place as scheduled. To prevent profits from being drastically reduced and to keep morale up amongst circus workers, many circus managers operated in this way. Think of a time when your child needed to continue on with something that needed to be completed, even though there were setbacks.

4. Words to Use

Below are several words that your child will be learning about and using. Try to use these words as they come up in everyday speech with your child.

- *aquatic*—Fish and other aquatic animals can be found in the lake south of town.
- *nest*—My grandmother spotted a robin's nest with four, small, blue eggs in it.
- *venomous*—When visiting a new ecosystem, it is a good idea to learn what kinds of venomous animals live there.
- *lungs*—My lungs help me to breathe air, but my pet goldfish must use its gills to get the oxygen it needs from water.
- *terrestrial*—Some of the larger terrestrial animals at the zoo, such as elephants and bears, need a lot of land in which to move around and exercise.

5. Read Aloud Each Day

It is very important that you read to your child each day. Set aside time to read to your child and also to listen to your child read to you. Remember to use the recommended trade book list sent with the first family letter.

Be sure to praise your child whenever s/he shares what has been learned at school.

Revision Checklist

Ask yourself these questions as you revise your paragraph.

1.	Do I have a good topic sentence?	
2.	Do I have a good concluding sentence?	
3.	Are there any parts that do not make sense?	
4.	Do my sentences flow well in this order?	
5.	Do I have a good variety of sentence structure?	
6.	Could I combine any of my sentences?	
7.	Do I have a good variety of descriptive words?	
8.	Is my paragraph interesting?	
9.	Is this my best work?	

Name: _____

Directions: Write your working title on the top line. Write the second draft of your informational paragraph on the lines below.

Name: _____

Editing Checklist

Ask yourself these questions as you edit your paragraph.

1.	Do I have a fitting title?	
2.	Do all of my sentences start with capital letters?	
3.	Do all of my sentences end with the correct punctuation?	
4.	Have I spelled all of my words correctly?	
5.	Have I used correct grammar?	
6.	Does each sentence provide a complete thought?	

Name: _____

Directions: Write your title on the top line. Write the final draft of your paragraph on the lines below.

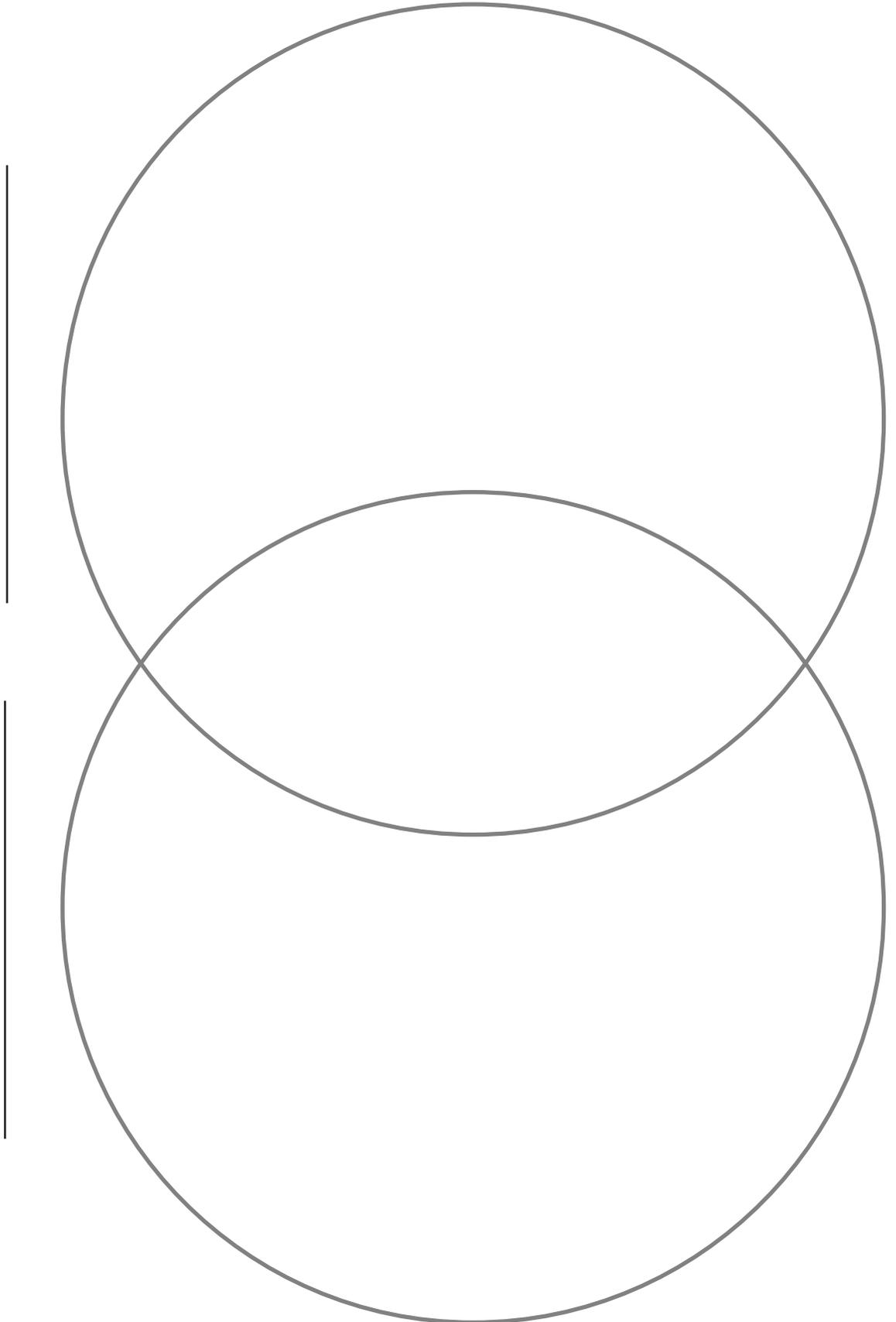
Writing Rubric

4	<p>The paragraph includes a strong topic sentence that is indented.</p> <p>The paragraph has multiple sentences with details supporting the topic sentence.</p> <p>Supporting sentences in each paragraph are organized in a coherent order.</p> <p>The paragraph has a strong concluding sentence.</p> <p>There are no errors in grammar, capitalization, or punctuation.</p>
3	<p>The paragraph includes a topic sentence that is indented.</p> <p>The paragraph has multiple sentences with details supporting the topic sentence.</p> <p>Supporting sentences in each paragraph are organized in a coherent order.</p> <p>The paragraph has a good concluding sentence.</p> <p>There are few errors in grammar, capitalization, or punctuation.</p>

2	<p>The paragraph includes a topic sentence, but it may not have been indented.</p> <p>The paragraph has sentences with some details supporting the topic sentence.</p> <p>Some supporting sentences in the paragraph are not properly sequenced.</p> <p>The paragraph has a weak concluding sentence.</p> <p>There are some errors in grammar, capitalization, or punctuation.</p>
1	<p>The topic sentence is missing or unclear.</p> <p>The paragraph has few sentences with details supporting the topic sentence.</p> <p>Supporting sentences in the paragraph are not properly sequenced.</p> <p>The concluding sentence is missing or unclear.</p> <p>There are many errors in grammar, capitalization, or punctuation.</p>
<p>Teacher Comments:</p>	

Name: _____

Directions: Write the two vertebrate groups you are comparing and contrasting on the two blanks. In the overlapping part of the diagram, write words and/or phrases that describe how the two things are alike. In the non-overlapping parts of each circle, write words and/or phrases that describe how the two things are different.



Name: _____

Directions: Read each question and the optional answers with your teacher. Circle the letter that best answers the question.

1. Why do scientists classify animals?
 - A. to organize information
 - B. to show relationships
 - C. to learn more about animals
 - D. all of the above

2. Which is **not** a way scientists classify animals into groups?
 - A. by how much they weigh
 - B. by their body covering
 - C. by whether they are cold-blooded or warm-blooded
 - D. by whether they are vertebrates or invertebrates

3. How do some warm-blooded animals keep their body temperatures constant when their surroundings are cold?
 - A. basking on a rock
 - B. going into the shade
 - C. burrowing in the mud
 - D. migrating

4. Which animal is **not** cold-blooded?
- A. a fish
 - B. a mammal
 - C. a reptile
 - D. an amphibian
5. How are animals that have backbones classified?
- A. as vertebrates
 - B. as invertebrates
 - C. as insects
 - D. as jellyfish

Directions: Read each question and the optional answers with your teacher. Circle the letter that best answers the question.

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Name: _____

Directions: Read the top row and left column with your teacher. Fill in the blanks on the chart to tell more about the groups of animals you have learned. The first row and some of the other parts have been completed for you.

Group	Cold-Blooded or Warm-Blooded	Vertebrate or Invertebrate	Body Covering
Insects	CB	IVB	exoskeleton
Fish	1. _____	2. _____	scales or slime
Amphibians	3. _____	4. _____	moist skin
Reptiles	CB	5. _____	6. _____
Birds	WB	7. _____	8. _____
Mammals	9. _____	VB	10. _____

Directions: Read the top row and left column with your teacher. Fill in the blanks on the chart to tell more about the groups of animals you have learned. The first row and some of the other parts have been completed for you.

Group	Cold-Blooded or Warm-Blooded	Vertebrate or Invertebrate	Body Covering
Insects	CB	IVB	exoskeleton
Fish	1. <u>CB</u>	2. <u>VB</u>	scales or slime
Amphibians	3. <u>CB</u>	4. <u>VB</u>	moist skin
Reptiles	CB	5. <u>VB</u>	6. <u>dry, scaly skin</u>
Birds	WB	7. <u>VB</u>	8. <u>feathers</u>
Mammals	9. <u>WB</u>	VB	10. <u>fur/hair</u>

Name: _____

1. Are there more warm-blooded or cold-blooded animals in the five groups of animals you learned about? Name one or two examples.

2. How would you compare and contrast warm-blooded and cold-blooded animals?

3. How is a mammal's body covering helpful? List at least one of the two ways.

Directions: Write one or two sentences to answer each question.

4. What are two interesting facts that you learned about animals?

5. In which animal group are humans classified? How do you know?

Tens Recording Chart

Use this grid to record Tens scores. Refer to the Tens Conversion Chart that follows.

Name							

Tens Conversion Chart

Number Correct

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	10																			
2	0	5	10																		
3	0	3	7	10																	
4	0	3	5	8	10																
5	0	2	4	6	8	10															
6	0	2	3	5	7	8	10														
7	0	1	3	4	6	7	9	10													
8	0	1	3	4	5	6	8	9	10												
9	0	1	2	3	4	6	7	8	9	10											
10	0	1	2	3	4	5	6	7	8	9	10										
11	0	1	2	3	4	5	5	6	7	8	9	10									
12	0	1	2	3	3	4	5	6	7	8	8	9	10								
13	0	1	2	2	3	4	5	5	6	7	8	8	9	10							
14	0	1	1	2	3	4	4	5	6	6	7	8	9	9	10						
15	0	1	1	2	3	3	4	5	5	6	7	7	8	9	9	10					
16	0	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10				
17	0	1	1	2	2	3	4	4	5	6	6	7	7	8	8	9	9	10			
18	0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10		
19	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	
20	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10

Simply find the number of correct answers the student produced along the top of the chart and the number of total questions on the worksheet or activity along the left side. Then find the cell where the column and the row converge. This indicates the Tens score. By using the Tens Conversion Chart, you can easily convert any raw score, from 0 to 20, into a Tens score.

Please note that the Tens Conversion Chart was created to be used with assessments that have a defined number of items (such as written assessments). However, teachers are encouraged to use the Tens system to record informal observations as well. Observational Tens scores are based on your observations during class. It is suggested that you use the following basic rubric for recording observational Tens scores.

9–10	Student appears to have excellent understanding
7–8	Student appears to have good understanding
5–6	Student appears to have basic understanding
3–4	Student appears to be having difficulty understanding
1–2	Student appears to be having great difficulty understanding
0	Student appears to have no understanding/does not participate

CORE KNOWLEDGE LANGUAGE ARTS

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