

The Bold and the Beautiful: Scientists Past & Present

Grade Level or Special Area: 3rd Grade

Written by: Janel Pullin, Suzi Langham and Ryan McDougal – Coronado Village Elementary School, San Antonio, Texas

Length of Unit: 8 lessons, culminating activity (Approximately 10-12 days)

I. ABSTRACT

As sand flows through the hourglass, so are the *Days of a Scientist's Life*. Students wonder what are the *Passions* or *Guiding Light* that caused famous scientists to have a thirst for knowledge and inquiry even *General Hospital* couldn't heal. This unit introduces four scientists and their quest for answers. Students experiment with theories, take a technological scavenger hunt and field trip. Students understand that *As the World Turns* past and present discoveries affect *All My Children*. Students learn that no matter what race, creed, sex, or religion, even *The Young and Restless* can become scientists!

II. OVERVIEW

A. Concept Objectives

1. Recognize that anyone can be a scientist!
2. Understand how the actions and thoughts of people in the past affect our world, as we know it.
3. Develop an awareness of how our current actions and thoughts as a culture will impact the future.
4. Understand that science can impact our daily lives.

B. Content from the *Core Knowledge Sequence*

1. Alexander Graham Bell
2. Copernicus
3. Mae Jemison
4. John Muir

C. Skill Objectives

1. Demonstrate safe practices during field and laboratory investigations (*TEKS Science 1.A.*)
2. Plan and implement descriptive investigations including asking well-defined questions, formulating testable hypothesis, and selecting and using equipment and technology (*TEKS Science 2.A.*)
3. Collect information by observing and measuring (*TEKS Science 2.B.*)
4. Analyze and interpret information to construct reasonable explanations from direct and indirect evidence (*TEKS Science 2.C.*)
5. Communicate valid conclusions (*TEKS Science 2.D.*)
6. Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information (*TEKS Science 3.A.*)
7. Represent the natural world using models and identify their limitations (*TEKS Science 3.C.*)
8. Evaluate the impact of research on scientific thought, society, and the environment (*TEKS Science 3.D.*)
9. Connect Grade 3 science concepts with history of science and contributions of scientists (*TEKS Science 3.E.*)

10. Demonstrate that repeated investigations may increase the reliability of results (*TEKS Science 4.B*)
11. Identify and record properties of soils such as color and texture, capacity to retain water, and ability to support the growth of plants (*TEKS Science 11.B.*)
12. Identify the planets in our solar system and their position in relation to the Sun (*TEKS Science 11.C.*)

III. BACKGROUND KNOWLEDGE

A. For Teachers

1. What Your Third Grader Needs to Know by E.D. Hirsch, Jr.
2. The Book Nobody Read by Owen Gingerich
3. Ptolemy Copernicus Kepler by Robert Maynard Hutchins
4. Famous Men of Science by Sarah K. Bolton
5. Muir: Nature Writings by William Cronon
6. Great Lives: The American Frontier by Patricia Calvert

B. For Students

1. Familiarity with navigating through the Internet
2. Familiarity with the scientific process
3. Solar system schema
4. Famous scientist schema
5. Basic measurement skills

IV. RESOURCES/BIBLIOGRAPHY

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V. LESSONS

Lesson One: Famous Scientist Activity

- A. *Daily Objective: Recognize that anyone can be a scientist*
- B. *Materials*
1. Drawing Paper, Pencils
 2. Pictures of famous scientists (books, Internet photos, etc.)
 3. Construction Paper (10 sheets per student, any color, 11X14)
 4. What is a Scientist? by Carol Krauss
- C. *Key Vocabulary*
1. Scientist- a person learned in science and especially natural science; a scientific investigator
- D. *Procedures/Activities*
1. Teacher will instruct the students to draw a detailed picture of a scientist, without any other directions or discussion (allow 20 minutes). The whole point is to tap into their schema in order to recognize their ideas and misconceptions of scientists.
 2. Students will share their drawings of their scientists, discussing their thoughts that they had as they created their pictures.
 3. Discuss misconceptions of scientists and explain that anyone can be a scientist. Have the students brainstorm the names of some famous scientists about whom they already know. Ask if these people look like any of their drawings.
 4. Show pictures of some famous scientists or show a Famous Scientists Slide Show.
 5. Have students make some sort of a journal for their study on Science Biographies. It can be as simple as pieces of construction folded and stapled or more creative if you wish. This is where students will journal and sketch throughout the unit. Make sure to set up a few pages in either the front or back of journal for vocabulary development throughout the unit. Use Appendix A (Student Copy) and Appendix B (Teacher Copy).
 6. Close with read-aloud, What is a Scientist?
- E. *Assessment/Evaluation*
1. Students will write a short paragraph explaining what a scientist is and who can be a scientist.

Lesson Two: Design a Best Selling Toy: How to Think Like a Scientist (Adapted from a lesson titled "Red Car Pet" by Teddy Goldman and Monica Lobser)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Recognize that anyone can be a scientist!
 - b. Understand how the thoughts and actions of people in the past affect our world, as we know it.
 - c. Develop an awareness of how our current actions and thoughts as a culture will impact the future.

2. Skill Objective(s)
 - a. Science TEKS 1.A., 2.A., 2.B., 2.C., 2.D., 3.A., 3.D.

B. *Materials* (for each group)

1. 1 large piece of poster board any color
2. 2 twelve inch pieces of wax paper
3. 8 paper cups
4. 2 paper plates
5. 1 roll of clear plastic tape
6. 5 pipe cleaners
7. 5 drinking straws
8. 1 twelve-inch square sheet of aluminum foil
9. 2 pairs of scissors
10. Science Biography Journals
11. How to Think Like a Scientist: Answering Questions by the Scientific Method by Stephen P. Kramer

C. *Key Vocabulary*

1. “thinking outside the box”

D. *Procedures/Activities*

1. Before beginning the activity, display the following guidelines:
Only the materials provided may be used to build a never before seen toy and a container in which to put that toy. Each group must decide on a name for the toy, and when time is up, the toy must fit inside the container. Each group has thirty minutes for the entire activity.
2. Spark the students’ interest by asking, “Have you ever wanted to be the person that creates or designs a brand new toy that kids today could enjoy?”
3. Divide students into groups of 4-6 (You may want to assign jobs to group members depending on how well your students work cooperatively – task master, materials manager, etc.)
4. The group will build a container from the materials provided. In addition, they will create a “toy” that will easily fit inside the container.
5. Students will have 30 minutes to complete their activity. Remind them as the time starts to count down ... “You have 10 minutes, you have 5 minutes, etc.”)
6. Groups will complete Appendix C “Design a Best Selling Toy” as they work with the group. By the end of the time, a student needs to be chosen as a spokesperson and will present the toy and container to the rest of the class.
7. Close with read-aloud, How to Think Like a Scientist: Answering Questions by the Scientific Method.

E. *Assessment/Evaluation*

1. Each group will choose a spokesperson from the group to share with the rest of the class. The spokesperson will share the group’s final product. He/she will also explain how the members of the group were discovering science in the role of a scientist.
2. Teacher will articulate the notion that scientists “think outside the box”.
3. In journals, students will write a few sentences about how they, as scientists, were “thinking outside the box” during this activity.

Lesson Three: Copernicus/ Heliocentric

A. Daily Objectives

1. Concept Objective(s)
 - a. Understand how the actions and thoughts of people in the past affect our world, as we know it.
2. Lesson Content
 - a. Copernicus
3. Skill Objective(s)
 - b. Science TEKS 1.A., 2.A., 2.B., 2.C., 2.D., 3.A., 3.C., 3.D., 3.E., 4.B., 11.C.

B. Materials

1. What Your Third Grader Needs to Know by E.D.Hirsch (pg.345)-
Copernicus
2. Nicolaus Copernicus: The Earth is a Planet by Dennis Brindell Fradin & Cynthia Von Buhler
3. Science Biography Journals
4. Labeled cards of the sun and the nine planets
5. Chart paper

C. Key Vocabulary

1. Copernicus- the founder of modern astronomy
2. Heliocentric- having or relating to the sun as center
3. Solar system- the sun together with the group of celestial bodies that are held by its attraction and revolve around it
4. Celestial bodies- of or relating to the sky or visible heavens
5. Axis- a straight line about which a body or geometric figure rotates
6. Astronomy- the study of objects and matter outside the earth's atmosphere and of their physical and chemical properties
7. Astronomer- one who studies astronomy
8. Sphere- a globular body
9. Planet- any of the large bodies that revolve around the sun in the solar system
10. Revolve- to move in a curved path around a center or axis

D. Procedures/Activities

1. Before introducing the Copernicus/Heliocentric activity, explain to the students that they will be learning about 4 famous scientists: Copernicus, Alexander Graham Bell, Mae Jemison, and John Muir.
2. Explain that they will first be learning about Nicolaus Copernicus. Ask the students if they know who he is or for what he is famous. Discuss. Write the key vocabulary words on the board.
3. Read the Copernicus excerpt from What a Third Grader Needs to Know, pg.345. (Stop and discuss specific information pertinent to the key vocabulary, and complete definitions as they are defined.)-*Students may also keep a running vocabulary journal for the Science Biography unit that can be started on the first day.*
4. Share the read-aloud, Nicolaus Copernicus: the Earth is a Planet, with the students.
5. On chart paper, the board, or wherever. Write the students' ideas for who Copernicus is and for what he is famous. They should have a good idea now that you've read about and discussed Copernicus.
6. Give background information on heliocentric model. "Our solar system is ***heliocentric***, which means there is a sun in the center and the ***celestial***

bodies of the **solar system** move around the sun. The Earth is one of the nine planets in our solar system.

7. Students will observe and record their thoughts while the teacher and a few students demonstrate the heliocentric model.
 8. Randomly select 10 students to represent the solar system. Place pre-made labels of the sun and planets on the students that have been chosen to be part of the demonstration. Clarify to students that the sun is NOT a planet.
 9. Have the “sun” stand in the center of the designated space.
 10. Strategically place the 9 “planets” in correct order from the sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto.
 11. Direct the “planets” to revolve around the sun in an elliptical path. Point out that the sun is in the center and that the planets revolve around the sun. Discuss how this supports Copernicus’ theory that our solar system is heliocentric, which means that the sun is the center of our solar system and that the nine planets revolve around the sun.
- E. *Assessment/Evaluation*
1. Students will share observations and make connections to Nicholas Copernicus and his findings. Students should be able to see the relationship between Copernicus’ discoveries that the planets revolve around the sun after observing the Heliocentric Experiment.
 2. In journal, students will illustrate the heliocentric model by drawing a picture of celestial bodies revolving around the sun, the center of our universe.
 3. Students will use the class notes to complete Appendix A – Copernicus.

Lesson Four: John Muir

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Recognize that anyone can be a scientist.
 - b. Understand how the actions and thoughts of the people in the past affect our world, as we know it.
 - c. Develop an awareness of how our current actions and thoughts as a culture will impact the future.
2. Lesson Content
 - a. John Muir
3. Skill Objective(s)
 - a. Science TEKS 1.A., 2.B., 3.C., 3.D., 3.E., 11.B.

B. *Materials*

1. What Your Third Grader Needs to Know by E.D. Hirsch (pgs. 346-347)-*Muir*
2. 5-6 objects found in nature that can be brought into the classroom (leaves, rocks, etc...)
3. John Muir: saving the wilderness by Corinne J. Naden and Rose Blue
4. John Muir by Glen Dines
5. Where Once There Was a Wood by Denise Fleming
6. Science Biography Journals

C. *Key Vocabulary*

1. Ecology- a branch of science concerned with the interrelationship of organisms and their environments

D. *Procedures/Activities*

1. Introduce John Muir by telling kids that we are going to learn about a scientist who specialized in the field of ecology. Ask if anyone knows the meaning of ecology, brainstorm and discuss the definition of ecology. Ask if anyone knows who John Muir is and for what he is famous, brainstorm.
2. Read excerpt from What Your Third Grader Needs to Know by E.D. Hirsch, *Muir* (pg 346-347). Discuss key points and vocabulary with students.
3. Discuss how John Muir is remembered as one of our foremost defenders of our natural heritage and what that means. He was also a firm believer in observing and sketching details in nature.
4. Place an object from nature on each table (a grouping of 4-6 students). Instruct the students to draw a sketch of the object, making sure to observe and include as many details as they see.
5. Share sketches, pointing out details and connect those ideas to the read aloud.
6. The students will already know, but remind them that they will be going on a field trip the next day.
7. Review the importance and purpose of the field trip. Explain that they will be observing details in nature, making sketches, and recording observations – as did John Muir.
8. End with read-aloud Where Once There Was A Wood by Denise Fleming.

E. *Assessment/Evaluation*

1. Students will record definitions for key vocabulary.
2. Students will write about John Muir in Appendix A – John Muir.

Lesson Five: John Muir – Nature Walk

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Recognize that anyone can be a scientist.
 - b. Understand how the actions and thoughts of people in the past affect our world, as we know it.
 - c. Develop an awareness of how our current actions and thoughts as a culture will impact the future.
2. Lesson Content
 - a. John Muir
3. Skill Objective(s)
 - a. Science TEKS 1.A, 2.B., 3.C., 3.D., 3.E., 11.B.

B. *Materials*

1. Nature Walk – Appendix D, pages 1 and 2
2. Pencils & Sketch Paper
3. Clipboards

C. *Procedures/Activities*

1. Before the field trip, divide students into groups of no more than 4 students. Assign a parent volunteer to each of the groups, and make sure that he/she is aware of the field trip requirements and rules.

2. During the field trip, students will use Appendix D (page 2) to observe, sketch, and record their findings of details in nature. Use Appendix D to guide their investigations.

D. *Assessment/Evaluation*

1. Teacher will review the Appendix D page 2 after the field trip.
Observation sheets can be glued/stapled into Science Biography journals.

Lesson Six: Alexander Graham Bell, Day One (30-45 minutes)

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Recognize that anyone can be a scientist.
 - b. Understand how the actions and thoughts of people in the past affect our world, as we know it.
 - c. Develop an awareness of how our current actions and thoughts as a culture will impact the future.
2. Lesson Content
 - a. Alexander Graham Bell
3. Skill Objective(s)
 - a. Science TEKS 1.A., 2.A., 2.B., 2.C., 2.D., 3.A., 3.D., 3.E.

B. *Materials*

1. Alexander Graham Bell by A. Roy Petrie
2. Always Inventing: A Photo Biography of Alexander Graham Bell by Tom L. Matthews
3. Alexander Graham Bell: Making Connections by Naomi Pasachoff
4. Alexander Graham Bell by Struan Reid

C. *Key Vocabulary*

1. Sound- mechanical radiant energy that is transmitted by longitudinal pressure waves in a material medium (as air) and is the objective cause of hearing
2. Vibration-a movement back and forth; rapid rhythmic movement back and forth; a periodic, to-and-fro motion or oscillation of an object when displaced from the rest position of equilibrium, as in sound.
3. Phonograph records-an instrument for reproducing sounds by means of the vibration of a stylus or needle following a spiral groove on a revolving disc or cylinder
4. X-ray machines-a machine that produces a band of electromagnetic radiation that is capable of penetrating opaque or solid substances to form a photograph
5. Circular kite-
6. Inventor- a person who invents; one who devised contrivance, method, etc.
7. Transmitter- an apparatus for transmitting radio or television signals
8. Receiver- a device for converting signals (as electromagnetic waves) into audio or visual form

D. *Procedures/Activities*

1. Introduce Alexander Graham by telling kids that we are going to learn about a scientist who was an inventor. Ask if anyone knows the difference between a scientist and an inventor, brainstorm. Create a class Venn diagram comparing and contrasting the similarities and differences between a scientist and an inventor. Have students fill out a personal

copy of a Venn diagram demonstrating the differences and similarities between scientists and inventors.

2. Ask if anyone knows who Alexander Graham Bell is and for what he is famous and brainstorm.
3. Read excerpt from What Your Third Grader Needs to Know by E.D. Hirsch, *Alexander Graham Bell* (pp. 347-348). Discuss key points and vocabulary with students.
4. Discuss the fact that Bell continued experimenting throughout his life and he invented early versions of the X-ray machine, circular kite, and phonograph records.
5. Students will complete Appendix A – Alexander Graham Bell

E. *Assessment/Evaluation*

1. Teacher will collect Venn diagram to ensure that students understand the similarities and differences between an inventor and a scientist.

Lesson 7: A “Look” at Sound: Alexander Graham Bell, Day 2 (45 – 60 minutes) can be split over two days.

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Recognize that anyone can be a scientist.
 - b. Understand how the actions and thoughts of people in the past affect our world, as we know it.
 - c. Develop an awareness of how our current actions and thoughts as a culture will impact the future.
 - d. Understand that science can impact our everyday lives.
2. Lesson Content
 - a. Alexander Graham Bell
 - b. Sound
3. Skill Objective(s)
 - a. Science TEKS 1.A., 2.A., 2.B., 2.C., 2.D., 3.A., 3.D., 3.E.

B. *Materials*

1. Slinky or spring
2. Large plastic container
3. Water
4. Ruler (or other object to create a vibration)
5. Bed Sheet or large piece of fabric
6. 2 Styrofoam cups
7. 10 ft. of fishing line
8. 2 paper clips
9. Appendix E – What Does Sound “Look” Like?

C. *Key Vocabulary*

1. Sound waves- longitudinal vibratory disturbances
2. Longitudinal- of or pertaining to length
3. Medium-a substance through which a force acts or an effect is transmitted

D. *Procedures/Activities*

1. Review Alexander Graham Bell from yesterday’s lesson. Talk to students about how he understood the nature of sound and created inventions that changed our society based on that knowledge.

2. Explain that today we are going to do a series of three experiments/demonstrations to explore the nature of sound and how it travels.
3. Read excerpt from What Your Third Grader Needs to Know, “Sound and Hearing” and “Good Vibrations, What Does Sound Travel Through” (pp. 315-316).
4. Conduct the three demonstrations:
 - a. Demonstration 1: The Slinky and Longitudinal Waves
 - Get two students to volunteer and have one stand on each end of the Slinky. Have one student push the Slinky toward the other student. This will create a visual representation of sound waves. The rings of the Slinky represent longitudinal sound waves and the movement shows how the vibrations go through the air.
 - b. Demonstration 2: The “Wave Pool”
 - Use the ruler to create a vibration against the side of the container. Ask students if they heard the sound the ruler made. Then, fill the large plastic container with water. Finally, direct them in small groups to view the water as you strike the side of the container. Help them make the connection that the sound is traveling through the water as vibrations, creating the waves that we see.
 - Also, generate a discussion about why sound could be heard more clearly when there was no water in the container. Be sure to define the word “medium.”
 - c. Demonstration 3: The “Paper Cup Telephone”
 - Construct a Styrofoam cup telephone using the two Styrofoam cups, paper clips and the piece of fishing line.
 - Poke holes in the bottom of the cups with a pencil. Thread the fishing line through the hole and tie it to a paper clip ... repeat for the other cup.
 - Ask for volunteers and have the students stand on the opposite end of the classroom. Make sure the line is taut, otherwise the vibrations won’t travel from one end to the other. Have one student give a specific message and have the other student listen for it. Make sure that the students understand that the sound waves are traveling along the line. Also reinforce the vocabulary of receiver and transmitter (cup and line respectively).
 - If there is time, have students experiment with the line loose or make the sound travel through a door, etc. Discuss with the students why it worked or didn’t work well.
5. Have students explore each of these demonstrations/experiments. Give about 5-10 minutes at each station and have them complete Appendix E – “What Does Sound ‘Look’ Like”.
6. Bring the group back to discuss what they discovered.

E. *Assessment/Evaluation*

1. Teacher will review Appendix E “What Does Sound ‘Look’ Like”
2. This can be glued/stapled into the students’ journal.

Lesson Eight: Mae Jemison: Web Quest Scavenger Hunt

- A.** *Daily Objectives*
1. Concept Objective(s)
 - a. Recognize that anyone can be a scientist.
 - b. Understand how the actions and thoughts of people in the past affect our world, as we know it.
 - c. Develop an awareness of how our current actions and thoughts as a culture will impact the future.
 2. Lesson Content
 - a. Mae Jemison
 3. Skill Objective(s)
 - a. Science TEKS 2.A., 2.C., 2.D., 3.A., 3.D.
- B.** *Materials*
1. Appendix F *So You Want to be an Astronaut*
 2. Internet accessible computers (at least 1 for every 2 students)
 3. What Your Third Grader Needs to Know by E.D. Hirsch (pp. 349-350)
 - 4.
- C.** *Key Vocabulary*
1. Astronaut- a person who explores outer space
 2. NASA- National Aeronautic Science Administration
 3. Compass- a device for determining directions
 4. Shuttle-a vehicle used for outer space exploration
 5. Launch- to send off or discharge with force
 6. Reentry- to enter again
 7. Crew- a group of people working together
 8. Shelter- something that provides cover or protection
 9. Gravity- the attractive central gravitational force exerted by a celestial body such as the earth
 10. Orbit- the path of a celestial body or manmade satellite as it revolves around another body
 11. Space station- a world-class, state-of-the-art orbiting research facility.
 12. Career- a chose pursuit
- D.** *Procedures/Activities*
1. Introduce Mae Jemison by telling the students that they are going to learn about a scientist who specialized in the field of Astronomy. Ask if anyone knows the meaning of Astronomy, and brainstorm. Ask if anyone knows who Mae Jemison is and for what she is famous, brainstorm and discuss.
 2. Read excerpt from, What Your Third Grader Needs to Know by E.D. Hirsch, *Jemison* (pgs. 349-350). Discuss key points and vocabulary with students.
 3. Discuss how Mae Jemison was the first African American woman to enter space, flew on space shuttle missions and conducted scientific experiments in space.
 4. Explain to the students that they are going to learn more about Mae Jemison by using the Internet to access important information about her.
 5. Go over specific guidelines to be followed during the use of the Internet, guidelines that you deem relevant.

6. Students will work in pairs to navigate through the website, <http://www.edspace.nasa.gov/>
7. Once the students have successfully located their site, explain that they need to be sure to visit all locations at this site to find the answers to the “training manual” Appendix F *So You Want to be an Astronaut?*
8. Students need to answer all of the questions on the “training manual”. The information from the website will give them the answers that they are required to find. It is quite probable that teacher guidance will be imperative during this activity.
9. After the “training manuals” are completed, discuss the observations made by the students during their Internet navigations.

E. *Assessment/Evaluation*

Teacher will assess student “training manuals”, Appendix F *So You Want to be an Astronaut?*

VI. CULMINATING ACTIVITY

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Recognize that anyone can be a scientist.
 - b. Understand how the actions and thoughts of people in the past affect our world, as we know it.
 - c. Develop an awareness of how our current actions and thoughts as a culture will impact the future.
2. Lesson Content
 - a. Culminating activity will include all information from the Unit “The Bold and the Beautiful: Scientists Past and Present.”
3. Skill Objective(s)
 - a. Science TEKS 1.A., 2.A., 2.B., 2.C., 2.D., 3.A., 3.D., 3.E.

B. *Materials*

1. A variety of materials may be used in this activity. Which materials are needed depends on the choices of the students.
2. Appendix G – 3rd Grade Scientist Product Choice Web

C. *Key Vocabulary*

1. All vocabulary from the Unit “The Bold and the Beautiful: Scientists Past and Present.”

D. *Procedures/Activities*

1. Students are divided into heterogeneous groups of 4-5 students.
2. Each group chooses 1 of the 4 scientists they studied.
3. Students will choose a product from Appendix G. The students will use this project to demonstrate their knowledge of that particular scientist.
4. Each group should assign the following:
 - a. Task master
 - b. Writer
 - c. Artist
 - d. Fact finder
5. Allow students in-class time to complete their projects.
6. Each group will present their product to the class. Allow time for students to visit/try each other’s product/presentation.

7. Close the unit by reading “The Kid Who Named Pluto: and the Stories of Other Extraordinary Young People in Science” by Marc McCutcheon. Reinforce to the students that **they** are capable of solving many problems as scientist.

E. *Assessment/Evaluation*

1. Teacher will review the final products to assess student’s understanding of their specific scientist.

VI. APPENDICIES

Appendix A- Student Journals

Appendix B- Teacher Version

Appendix C- Design a Best Selling Toy

Appendix D- Nature Walk

Appendix E- What Does Sound Look Like?

Appendix F- “So You Want To Be An Astronaut?”

Appendix G- 3rd Grade Scientist Product Choice Webs

Scientist Past and Present Journal

Student Name _____

Copernicus

(1473 – 1543)

Who was Copernicus?

What is Copernicus famous for?

John Muir

(1838-1914)

Who was John Muir?

What is John Muir famous for?

Alexander Graham Bell

(1847 –1922)

Who was Alexander Graham Bell?

What is Alexander Graham Bell famous for?

Mae Jemison

(1956 -)

Who is Mae Jemison?

What is Mae Jemison famous for?

Scientist Past and Present Journal

Student Name _____

Copernicus

(1473 – 1543)

Who was Copernicus?

- Copernicus was interested in astronomy.
- He wrote On the Revolutions and
- On the Revolutions of the Heavenly Spheres.
Copernicus introduced the heliocentric hypothesis.

What is Copernicus famous for?

He was an advocate of the theory that the Sun, and not the Earth, is at the center of the Universe (heliocentric hypothesis).

John Muir

(1838-1914)

Who was John Muir?

- Muir has been called "The Father of our National Parks" and "Citizen of the Universe."
- Muir was a wilderness explorer.
- President Theodore Roosevelt was inspired by Muir to start conservation programs.
- John Muir helped form the Sierra Club.

What is John Muir famous for?

He was America's most famous and influential naturalist and conservationist.

Alexander Graham Bell

(1847 –1922)

Who was Alexander Graham Bell?

- Bell was an inventor and a teacher of the deaf.
- His invention of the telephone grew out of his research into ways to improve the telegraph.

What is Alexander Graham Bell famous for?

Bell is best known for perfecting the telephone to transmit messages by electricity.

Mae Jemison

(1956 -)

Who is Mae Jemison?

- The first African American woman to go into space.
- Mae is a physician, former astronaut, and a business person.
- Mae flew into space with six other astronauts aboard the Endeavor.

What is Mae Jemison famous for?

She was the first African American woman to go into space.

Design a Best-Selling Toy

Group Members:

- 1.**
- 2.**
- 3.**
- 4.**

Directions:

With the materials provided, your group will create a never before seen toy and a container to hold the toy.

As you work, use and answer the following guiding questions.

- 1. What kind of toy are you going to create?**

- 2. What kind of container will this toy fit in?**

- 3. What step(s) in the scientific process did you use to create the toy and container? (Problem/Question, Research, Hypothesis, Materials, Experiment, Observation, and Conclusion)**

- 4. How do you think the members of your group were acting like scientists? Explain your answer giving examples from your group discussion.**

Nature Walk



(Taken from: http://www.sierraclub.org/john_muir_exhibit/john_muir_day_study_guide/)

Name: _____

Date: _____

Nature Walk Observation Sheet

Name of your object: _____

- Measure the length of your object.

- Weigh your object.

- Describe the shape of your object.

- What is the texture of your object? How does it feel?

- What color(s) is your object?

- What does the object smell like?

- On the back of this sheet, draw a sketch of your object.

What Does Sound “Look” Like

Write down any observations and questions from the three experiments.

Experiment 1: The Slinky and Longitudinal Waves

What materials were used?

What happened?

Experiment 2: “Wave Pool”

What materials were used?

What happened?

Experiment 3: “Paper Cup Telephone”

What materials were used?

What happened?



So You Want To Be An Astronaut...



Mae Jemison did not become a famous astronaut overnight. Becoming an astronaut takes years of preparation once NASA chooses you. So astronaut wanna-bes, go to the website listed below to begin your training. Be sure you visit all locations at this site to find the answers to your training questions.

<http://www1.edspace.nasa.gov/>

Click on Meet the Astronauts to answer the following questions:

Daily Life

“A Day in the Life”

1. How long does it take for the space shuttle to reach space?
 - a. 8 hours
 - b. 1 day
 - c. 1 hour
 - d. 8 minutes

2. How often can the space shuttle orbit the Earth?
 - a. Every 90 minutes
 - b. Every 30 minutes
 - c. Every 10 minutes
 - d. Every 45 minutes

3. What speed does the space shuttle travel at?
 - a. 65 mph (miles per hour)
 - b. 2,500 mph
 - c. 30 mph
 - d. 18,000 mph

4. In learning how to work with their tools, astronauts wear their space suit:
 - a. In the desert
 - b. In the classroom
 - c. Under water
 - d. In the NASA herb garden

5. What do Astronauts call the cap they wear? The _____ cap.

“Astronaut Life”

6. After 6 months in space, astronauts:
 - a. Age slightly less than everyone else on the ground.
 - b. Look much older than those of their age on the Earth
 - c. Gain 50 pounds from eating “space” food

- d. Forget how to walk on Earth

Astronaut School

“Survival Training”

- 7. During launch and reentry of the shuttle, astronauts wear the Advanced Crew Escape Suit also known as:
 - a. The orange suit
 - b. The tangerine suit
 - c. The reflector suit
 - d. The squash suit

- 8. Where is the one-person life raft found in the space shuttle?
 - a. Below the sink
 - b. To the right of the space hatch
 - c. On the back of the crew escape suit
 - d. Attached to the sole of the left astronaut boot

- 9. In the search for water in a desert an astronaut can (list at least 3)
 - a.

 - b.

 - c.

- 10. In the search for food in a forest astronauts can eat the following 4 items:
 - a.
 - b.
 - c.
 - d.

- 11. Astronauts learn to build two types of fires in survival training. In the forest they build a _____ fire. In the desert they learn to build a _____ fire.

- 12. What are two nature shelters an astronaut could use for short-term use?

- 13. What direction does the red end of the magnetic needle always point to on a compass:
 - a. North
 - b. South
 - c. East
 - d. West

- 14. What is the name of the reference point NASA refers to for time?

- 15. How many time zones is the Earth divided into?
 - a. 10
 - b. 24
 - c. 36

d. 50

Living in Space

“What is Space Really Like?”

16. There is gravity in space.

True or False

17. Why do objects float in space:

- a. The inward force of gravity is balanced by an equal outward force as the spacecraft moves through an orbit.
- b. Because Earth objects are lighter than those found in space.
- c. The outward force of gravity lifts the spacecraft up into orbit.
- d. Fluids found in the space shuttle freeze in space thus causing the object to float into orbit.

“Space Fashion”

18. Why is there a vacuum in the astronauts’ space suit:

- a. To suck up any food crumbs
- b. To keep the astronauts’ blood from boiling
- c. To keep the astronauts adhered to the space station
- d. To keep the astronauts cool

“Food in Space”

19. Why do astronauts not eat bread or crackers in space?

“Careers at NASA”

20. List 3 of the many jobs you could do as a career with NASA:

- a.
- b.
- c.

Appendix G – 3rd Grade Scientist Product Choice Web

