

Our Solar System

Grade Level or Special Area: First Grade

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Length of Unit: Nine lessons (approximately forty-five minutes each)

I. ABSTRACT

In this unit, first grade students will develop an understanding of the Earth and the Solar System. Through hands-on activities, pictures, and informational books, the students will recognize and learn about the planets and their positions in space. Throughout this unit the students will compile a Solar System coloring book, demonstrating the physical characteristics of the Sun and the nine planets. Research skills will be introduced and utilized through individual planet reports.

II. OVERVIEW

A. Concept Objectives

1. Students will understand the concept of the sun and stars as a source of energy, light, and heat.
2. Students will understand the relation of the earth and the other planets within the solar system.
3. Students will understand the processes and interactions of the earth's systems and the structure and dynamics of Earth and other objects in space. (Colorado Science Standard (CSS) 1.4)
4. Students will understand the interrelationships among science, technology, and human activity and how they affect the world. (CSS 1.5)

B. Content from the *Core Knowledge Sequence*

1. First Grade Science: Astronomy (page 39)
 - a. Sun: source of energy, light, heat
 - b. Moon
 - c. The nine planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto)
 - d. Stars
 - i. The sun is a star.
 - e. Earth and its place in the solar system
 - i. The earth moves around the sun; the sun does not move.
 - ii. The earth revolves (spins); one revolution takes one day (24 hours)
 - iii. Sunrise and sunset
 - iv. When it is day where you are, it is night on the opposite side of the earth

C. Skill Objectives

1. Students will demonstrate understanding that the solar system consists of the sun and the nine planets that orbit around it by creating a replica of the solar system.
2. Students will memorize and learn the solar system rhyme by repeating the rhyme each day before introducing the next lesson.
3. Students will remember the planets in the solar system by learning and using a rhyme to remember the correct planet order.
4. Students will understand that the Sun is the star at the center of the universe and the other planets orbit around the sun by reading and discussing information presented in the lesson.

5. Students will demonstrate understanding that Mercury is the smallest planet in the solar system, and is the closest to the sun by correctly answering questions during the question/answer session.
6. Students will identify physical characteristics of Mercury and Venus.
7. Students will demonstrate that the Earth is the third planet from the Sun and is the only planet that has life.
8. Students will show understanding that Earth has one large moon, which is known as the Earth's satellite.
9. Students will demonstrate knowledge that the Moon is covered in craters, which were made by asteroids, by correctly completing coloring page showing physical characteristics.
10. Students will learn that Mars is the fourth planet from the Sun and is a rocky planet in the solar system.
11. Students will understand that Mars is known as the Red Planet because it is covered entirely covered in red dust through the completion of the coloring book pages.
12. Students will identify that Jupiter is the fifth planet from the Sun.
13. Students will recognize Jupiter as largest planet.
14. Students will demonstrate understanding of the color and physical characteristics of Jupiter by completing the color pages showing the Great Red Spot.
15. Students will identify Saturn as the sixth planet from the Sun.
16. Students will demonstrate their understanding of Saturn's color and physical attributes by completing the color page using the correct colors and illustrating Saturn's rings.
17. Students will demonstrate their understanding of Uranus as the seventh planet from the Sun.
18. Students will demonstrate their understanding of Uranus's physical characteristics (color and rings) by completing the color page using the correct colors and illustrating Uranus' rings.
19. Students will understand that Neptune is the eighth planet from the Sun.
20. Students will demonstrate their understanding of Neptune's physical characteristics by completing the color page using the correct colors.
21. Students will demonstrate their understanding of Pluto's as the ninth planet from the Sun.
22. Students will demonstrate their understanding of Pluto's physical characteristics by completing the color page using the correct colors.
23. Students will demonstrate their learning of the planets in our solar system by completing a research project of an assigned planet.

III. BACKGROUND KNOWLEDGE

- A. For Teachers
 1. *What Your First Grader Needs to Know* by E.D. Hirsch, Jr.
 2. Web site: www.enchantedlearning.com/crafts/astronomy/solarsystemmodel/
 3. Web site: <http://www.windows.ucar.edu/>
 4. *The Solar System*, by Anne McRae (Junior Science Series)
- B. For Students
 1. Taking Care of the Earth, *Core Knowledge Sequence* in Kindergarten Science
 2. Seasons and Weather, *Core Knowledge Sequence* in Kindergarten Science

IV. RESOURCES

- A. *The Magic School Bus Lost in Space*, by Joanna Cole (Lesson One)

- B. *The Solar System*, by Anne McRae (Lessons Four and Six)
- C. *Destination Jupiter*, Seymour Simon (Lesson Seven)
- D. *Our Planet*, by Scott Steedman (Lesson Five)
- E. *Looking at the Planets*, by Melvin Berger (Lessons Two, Five, and Eight)
- F. *The Moon Book*, by Gail Gibbons (Lesson Five)
- G. *The Sun*, by Jenny Tesar (Lesson Three)
- H. *Destination Mars*, by Seymour Simon (Lesson Six)
- I. *Saturn*, by Gregory Vogt (Lesson Seven)
- J. *The Incredible Journey to the Planets*, by Nicolas Harris (Lesson Three)
- K. *Our Solar System*, by Ian Graham (Lesson Three)
- L. *Our Solar System*, by Seymour Simon (Lesson Four, Five)

V. LESSONS

Lesson One: Magic School Bus Lost in Space (45 minutes)

- A. Daily Objective
 - 1. Concept Objective(s)
 - a. Students will understand the relation of the earth and the other planets within the solar system.
 - b. Students will understand the processes and interactions of the earth's systems and the structure and dynamics of Earth and other objects in space.
 - c. Students will understand the interrelationships among science, technology, and human activity and how they affect the world.
 - 2. Lesson Content
 - a. Sun: source of energy, light, heat
 - b. Earth's Moon
 - c. The nine planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto)
 - d. Stars
 - i. The sun is a star.
 - e. Earth and its place in the solar system
 - i. The earth moves around the sun; the sun does not move.
 - ii. The earth revolves (spins); one revolution takes one day (24 hours)
 - iii. Sunrise and sunset
 - 3. Skill Objectives
 - a. Students will demonstrate understanding that the solar system consists of the sun and the nine planets that orbit around it by creating a replica of the solar system.
- B. *Materials*
 - 1. The book *The Magic School Bus Lost in Space*, by Joanna Cole
 - 2. 9" x 12" piece of black construction paper (one for each student)
 - 3. Crayons (one box with a variety of colors for each student)
 - 4. Glue (one bottle or glue stick for each student)
 - 5. Scissors (one pair for each student)
 - 6. Appendix A (one page for each student)
- C. *Key Vocabulary*
 - 1. Solar System – consists of the sun, and nine planets, and their moons; our solar system is a part of the Milky Way galaxy
 - 2. Sun – a star at the center of our solar system

3. Star – a ball of constantly exploding gases, giving off light and heat
4. Planets – orbit, or move, in a path around a star; there are nine known planets in our solar system

D. *Procedures/Activities*

1. This lesson can be used as an introduction to the solar system.
2. Read and discuss the book *The Magic School Bus Lost in Space* to students. Ask the following discussion questions.
 - a. What is the Solar System? (The Sun and all of the nine planets that orbit around it, their moons the asteroids and comets.)
 - b. What makes night and day? (The spinning of the earth makes night and day) When one side of the earth faces the sun it is sunrise (daytime) on that side. When that side turns away from the Sun, it is sunset (or nighttime). It takes twenty-four hours (one day) for the Earth to make one complete rotation. (turn)
 - c. What are the nine planets? (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto.)
 - d. How long is a year? (The time it takes a planet to orbit around the Sun.)
3. The teacher will demonstrate the position of the planets in the solar system using a bulletin board display of the Sun and planets in order (bulletin boards are available at the local teaching supply store).
4. Have students create a representation of the solar system:
 - a. Each child will get the supplies they need from the art center (black construction paper, crayons, glue, and scissors).
 - b. Students will color the planets and cut out (Appendix A).
 - c. Students will glue the planets on the black construction paper in the correct order by looking at the teacher’s model.
 - d. Make sure the students are putting the planets in the correct order using the teacher’s model drawn on the white board.
The teacher will discuss the definitions and meanings of the following vocabulary words: Solar System, Sun, Star, and Planets.

E. *Assessment/Evaluation*

1. Teacher observation of the student’s participation during discussion of the story read (*The Magic School Bus Lost in Space*).
2. The teacher will observe each child’s planet chart checking for accuracy of planet order.

Lesson Two: Solar System Rhyme (45 minutes)

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students will understand the relation of the earth and the other planets within the solar system.
2. Lesson Content
 - a. The nine planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto)
3. Skill Objective(s)
 - a. Students will remember the planets in the Solar System by learning and using a rhyme to remember the correct planet order.
 - b. Students will memorize and learn the solar system rhyme by repeating the rhyme each day before introducing the next lesson.

B. *Materials*

1. The Rhyme: **My Very Educated Mother Just Served Us Nine Pizza** (Appendix B) (*Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto* (one for each student))
2. Chart paper or white board for KWL chart/ markers
3. Glue (one bottle or glue stick for each student)
4. Construction paper (9" x 12") (one for each student)
5. Pocket chart or white board (one-two pocket charts for the classroom)
6. Word cards with the words: My, Mercury, Very, Venus, Educated, Earth, Mother, Mars, Just, Jupiter, Served, Saturn, Us, Uranus, Nine, Neptune, Pizzas, Pluto
7. Books or posters with planet order, *Looking at the Planets: A Book about the Solar System*, by Melvin Berger (posters by Frank Shaffer)

C. *Key Vocabulary*

None

D. *Procedures/Activities*

1. The teacher will begin with a review session on space and the solar system from information learned in Lesson One.
2. The class will formulate the KWL chart on the white board or chart paper.
3. The teacher will ask the following questions about the solar system to assess understanding.
 - a. What is the solar system? (The solar system is made up of the Sun and the nine planets, and their moons.)
 - b. What makes night and day? (The spinning of the Earth makes night and day.)
 - c. What makes the moon shine? (The light is really light from the Sun.)
 - d. What star can we only see in the daytime? (The Sun)
 - e. What planet do you live on? (The Earth)
4. Record student's answers from the review session on the "knowledge" section of the KWL chart.
5. Ask students what they want to learn about the Solar System and record the student responses on the "wonder" section on the KWL chart.
6. Use books and posters to demonstrate the order of the planets (*Looking at the Planet: A Book about the Solar System*, by Melvin Berger, posters by Frank Shaffer).
7. The teacher will introduce and organize the rhyme from Appendix B, and place word strips in a pocket chart with the corresponding planet.
8. The teacher will have a variety of students practice placing the rhyme in the pocket chart in the correct order.
9. The students will recite the rhyme after a student has placed the rhyme in the pocket chart.
10. The teacher will assist the students as they are learning the rhyme by saying the rhyme with them.
11. Students can engage in competitions to see which team can complete the rhyme the quickest. (For this activity you will need two pocket charts and another set of word cards.)
12. The students will cut out the rhyme and planet words and glue them on construction paper in the correct order using their own copy of Appendix B.

- E. *Assessment/Evaluation*
1. At the end of the lesson, students will be informally assessed on ability to recite the rhyme and planet order by reciting the poem to the class. During the course of this unit each child will have a chance to recite the rhyme and planet order.

Lesson Three: My Solar System Coloring Book (The Sun) (45 minutes)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students will understand the concept of the sun and stars as a source of energy, light, and heat.
 - b. Students will understand the relation of the Sun, Earth and the other planets within the solar system.
 2. Lesson Content
 - a. Sun: source of energy, light, heat
 - b. Stars
 - i. The sun is a star.
 3. Skill Objective(s)
 - a. Students will understand that the Sun is the star at the center of the universe and the other planets orbit around the sun by reading and discussing information presented in the lesson.
- B. *Materials*
1. Crayons or markers (one box for each student)
 2. One-two pencils for each student
 3. Appendix C (The Sun) (one copy for each student)
 4. Appendix C (The Sun) (one overhead for the teacher)
 5. Appendix N (for the cover of the book) on 9" x 12" cardstock or construction paper (one copy for each student)
 6. *The Sun*, by Jenny Tesar
- C. *Key Vocabulary*
1. Atmosphere – a layer of gas that surrounds some stars, planets, and moons
 2. Energy – there are many different forms of energy including heat, light, sound, electrical, and chemical energy
 3. Temperature – how hot or cold something is
 4. Sunspot – dark cool patches on the surface of the Sun
 5. Solar Flare – giant storms on the surface of the Sun
- D. *Procedures/Activities*
1. The students will create a personalized fact filled coloring book about the planets, using Appendix N (cover page).
 2. The teacher will read the book *The Sun*, by Jenny Tesar.
 3. This lesson can include other informational books such as *The Incredible Journey to the Planets*, by Nicolas Harris and *Our Solar System*, by Ian Graham.
 4. The teacher and students will read (Appendix C: The Sun) together in class and complete this page together as a group. The page will be colored according to the written description of the sun and planets for the lesson that day, showing understanding of solar flares and sunspots by drawing them on the picture of the Sun.
 5. The teacher will check for understanding by asking the following questions:
 - a. Which star do we only see in the daytime? (The Sun)
 - b. What is a sunspot? (The areas on the Sun that are cooler than the rest of the Sun.)
 - c. What are solar flares? (They are giant storms on the surface of the Sun.)

- E. *Assessment/Evaluation*
1. Use the Rubric in Appendix Q as the assessment for the book. This rubric will be used to assess the student's ability to follow directions, use of realistic colors, understanding of physical landmarks and characteristics, managing time, class participation and knowledge obtained through the completion of the coloring book. Student progress will be recorded on Appendix Q (Rubric).

Lesson Four: My Solar System Coloring Book (Day Two) (45 minutes)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students will understand the relation of the earth and the other planets within the solar system.
 2. Lesson Content
 - a. The nine planets (Mercury and Venus)
 3. Skill Objective(s)
 - a. Students will demonstrate understanding that Mercury is the smallest planet in the solar system, and is the closest to the sun by correctly answering questions during the question/answer session.
 - b. Students will identify physical characteristics of Mercury and Venus.
- B. *Materials*
1. Appendices D and E (one page for each student)
 2. Crayons or Markers (one box of crayons for each student)
 3. Appendices D and E (one overhead for the teacher)
 4. One-two pencils for each student
 5. The book *The Solar System*, by Anne McRae
- C. *Key Vocabulary*
1. Planet – a smaller object that orbits the sun; planets do not radiate their own light, but reflect the light from a star
 2. Craters – a saucer shaped feature found on the surface of many moons and asteroids, and some planets; it is formed by the impact of meteorites
 3. Orbit – the circular path followed by one object around another
 4. Carbon Dioxide – a poisonous gas
- D. *Procedures/Activities*
1. The teacher will read *The Solar System*, by Anne McRae.
 2. The teacher will discuss with the students facts about the planets Mercury and Venus. This lesson will include informational books such as *Our Solar System*, by Seymour Simon.
 3. The teacher may use pictures from NASA to further aid in student's understanding.
 4. Teacher will make an overhead using Appendices D and E (Mercury and Venus).
 5. The teacher and students will read Appendices D and E together in class and complete these pages together as a group. Each page will be colored according to the written description of planets for the lesson that day.
 6. The teacher will check for understanding through a question/answer session.
- E. *Assessment/Evaluation*
1. Use the Rubric in Appendix Q as the assessment for the book. This rubric will be used to assess the student's ability to follow directions, use of realistic colors, understanding of physical landmarks and characteristics, managing time, class participation and knowledge obtained through the completion of the coloring book. Student progress will be recorded on Appendix Q (Rubric).

Lesson Five: My Solar System Coloring Book (45 minutes)

A. Daily Objectives

1. Concept Objective(s)
 - a. Students will understand the relation of the earth and the other planets within the solar system.
2. Lesson Content
 - a. Moon: phases of the moon (full, half, crescent, new)
 - b. Earth and its place in the solar system
 - i. The earth moves around the sun; the sun does not move.
 - ii. The earth revolves (spins); one revolution takes one day (24 hours)
 - iii. Sunrise and sunset
 - iv. When it is day where you are, it is night on the opposite side of the earth.
3. Skill Objective(s)
 - a. Students will demonstrate that the Earth is the third planet from the Sun and is the only planet that has life.
 - b. Students will show understanding that Earth has one large moon, which is known as the Earth's satellite.
 - c. Students will demonstrate knowledge that the Moon is covered in craters, which were made by asteroids, by correctly completing coloring page showing physical characteristics.

B. Materials

1. The book *Our Planet*, by Scott Steedman
2. The book *Looking at the Planets*, by Melvin Berger
3. The book *The Moon Book*, by Gail Gibbons
4. Overhead projector
5. Appendices F and G (one copy per student)
6. Overhead transparency with Appendices F and G
7. Crayons
8. Markers
9. One-two pencils

C. Key Vocabulary

1. Milky Way – the name given to the spiral shaped galaxy in which the Earth and Solar System lie
2. Moon – a smaller object that orbits a planet, also known as a natural satellite
3. Oxygen – a gas in the air that most living things need to breathe to stay alive
4. Gravity – the force that pulls things toward the Earth's surface or toward each other

D. Procedures/Activities

1. The teacher will read *Our Planet*, by Scott Steedman.
2. The teacher will discuss with the students that Earth is the largest of the four rocky planets, and is the third planet from the Sun.
3. This lesson will include informational books (as noted in the reference section). The teacher may also show pictures from NASA website.
4. The teacher and students will read Appendices F and G-The Earth and Moon together in class and complete these pages together as a group. Each page will be colored according to the written description of planets for the lesson that day.
5. The teacher will read information to the students from *The Moon Book*, by Gail Gibbons.
6. The teacher will check for understanding through a question/answer session.

- a. Which planet is third from the Sun? (Earth)
 - b. Which planet has life? (Earth)
 - c. How many moons does earth have? (One)
 - d. What planet do you live on? (Earth)
 - e. What is gravity? (The force that pulls thing toward the Earth)
- E. *Assessment/Evaluation*
1. Use the Rubric in Appendix Q as the assessment for the book. This rubric will be used to assess the student's ability to follow directions, use of realistic colors, understanding of physical landmarks and characteristics, managing time, class participation and knowledge obtained through the completion of the coloring book. Student progress will be recorded on Appendix Q (Rubric).

Lesson Six: My Solar System Coloring Book (45 minutes)

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students will understand the relation of the earth and the other planets within the solar system.
2. Lesson Content
 - a. The nine planets (Mars)
3. Skill Objective(s)
 - a. Students will learn that Mars is the fourth planet from the Sun and is a rocky planet in the solar system.
 - b. Students will understand that Mars is known as the Red Planet because it is covered entirely covered in red dust through the completion of the coloring book pages.

B. *Materials*

1. The book *The Solar System*, by Anne McRae
2. The book *Destination Mars*, by Seymour Simon
2. Overhead projector
3. Appendix H (Mars) (one for each student)
4. Appendix H (Mars) (one for overhead)
1. <http://kids.msfc.nasa.gov> for more information about asteroids
2. Crayons or markers (one box for each student)
3. One-two pencils for each student

C. *Key Vocabulary*

1. Asteroid – rocky body that orbits the Sun
2. Asteroid Belt – orbits the Sun between Mars and Jupiter
3. Pathfinder – a space probe that landed on Mars to take pictures of its surface
4. Olympus Mons – the largest volcano in the Solar System

D. *Procedures/Activities*

1. The teacher will read the book *Destination Mars*, by Seymour Simon to the class.
2. The teacher will discuss with the students about the planet Mars. This lesson will include informational books i.e.: *The Solar System*, by Anne McRae.
3. The students will learn the meaning of the vocabulary words: asteroid and asteroid belt as the teacher shows and discusses pictures of asteroids and asteroid belts from the NASA website: <http://kids.msfc.nasa.gov>.
4. The teacher and students will read Appendix H-Mars together in class and complete this page together as a group. Each page will be colored according to the written description of planets for the lesson that day.
5. The teacher will check for understanding through a question/answer session. Here are some questions for the teacher to ask:

- a. Mars is also known as the _____ planet. (Red)
 - b. Mars is the _____ planet in the solar system. (Fourth)
 - c. Is Mars a rocky planet or a gaseous planet? (Rocky)
 - d. What is an asteroid? (A rocky body that orbits the Sun)
- E. *Assessment/Evaluation*
1. Use the Rubric in Appendix Q as the assessment for the book. This rubric will be used to assess the student's ability to follow directions, use of realistic colors, understanding of physical landmarks and characteristics, managing time, class participation and knowledge obtained through the completion of the coloring book. Student progress will be recorded on Appendix Q (Rubric).

Lesson Seven: Our Solar System Coloring Book (45 minutes)

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students will understand the relation of the earth and the other planets within the solar system.
2. Lesson Content
 - a. The nine planets (Jupiter and Saturn)
3. Skill Objective(s)
 - a. Students will identify that Jupiter is the fifth planet from the Sun.
 - b. Students will recognize Jupiter as largest planet.
 - c. Students will demonstrate understanding of the color and physical characteristics of Jupiter by completing the color pages showing the Great Red Spot.
 - d. Students will identify Saturn as the sixth planet from the Sun.
 - e. Students will demonstrate their understanding of Saturn's color and physical attributes by completing the color page using the correct colors and illustrating Saturn's rings.

B. *Materials*

1. The book *Destination: Jupiter*, by Seymour Simon
2. The book *Saturn*, by Gregory L. Vogt
3. Overhead projector
4. Appendices I and J (Jupiter and Saturn) (one copy each for each student)
5. One overhead of Appendices I and J for the teacher
6. Crayons or markers (one box for each student)
7. One-two pencils for each student

C. *Key Vocabulary*

1. The Great Red Spot – a huge storm on the surface of Jupiter
2. Gas planet – a planet made up of gases and liquids
3. Axis – an imaginary line that runs through the center of the planet, around which the planet spins

D. *Procedures/Activities*

1. The teacher will read the book *Destination: Jupiter*, by Seymour Simon.
2. The teacher will read the book: *Saturn*, by Gregory L. Vogt.
3. The teacher and students will read the information on Appendices I and J together in class and complete these pages together as a group. Each page will be colored according to the written description of planets for the lesson that day.

E. *Assessment/Evaluation*

1. Use the Rubric in Appendix Q as the assessment for the book. This rubric will be used to assess the student's ability to follow directions, use of realistic colors, understanding of physical landmarks and characteristics, managing time, class

participation and knowledge obtained through the completion of the coloring book. Student progress will be recorded on Appendix Q (Rubric).

Lesson Eight: Solar System Coloring Book (45 minutes)

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students will understand the relation of the earth and the other planets within the solar system.
2. Lesson Content
 - a. The nine planets (Uranus, Neptune, Pluto)
3. Skill Objective(s)
 - a. Students will demonstrate their understanding of Uranus as the seventh planet from the Sun.
 - b. Students will demonstrate their understanding of Uranus's physical characteristics (color and rings) by completing the color page using the correct colors and illustrating Uranus' rings.
 - c. Students will understand that Neptune is the eighth planet from the Sun.
 - d. Students will demonstrate their understanding of Neptune's physical characteristics by completing the color page using the correct colors.
 - e. Students will demonstrate their understanding of Pluto's as the ninth planet from the Sun.
 - f. Students will demonstrate their understanding of Pluto's physical characteristics by completing the color page using the correct colors.

B. *Materials*

1. *Looking at the Planets*, by Melvin Berger
2. Overhead projector
3. Appendix K (Uranus) (one copy for each student)
4. Appendix L (Neptune) (one copy for each student)
5. Appendix M (Pluto) (one copy for each student)
6. Appendices K, L, and M (one overhead of each planet for the teacher)
7. Crayons or markers (one box for each student)
8. One-two pencils for each student

C. *Key Vocabulary*

1. Revolution – orbital motion around a point
2. Universe – the whole of space and everything it contains
3. Weightless – floating in space and feeling as if you weighed nothing

D. *Procedures/Activities*

1. The teacher will read *Looking at the Planets*, by Melvin Berger to the students.
2. The teacher and students will read the information on Appendices K, L, and M (Uranus, Neptune, and Pluto) and complete these pages together as a group. Each page will be colored according to the written description of planets for the lesson that day.

E. *Assessment/Evaluation*

1. Use the Rubric in Appendix Q as the assessment for the book. This rubric will be used to assess the student's ability to follow directions, use of realistic colors, understanding of physical landmarks and characteristics, managing time, class participation and knowledge obtained through the completion of the coloring book. Student progress will be recorded on Appendix Q (Rubric).

Lesson Nine: Our Planet Report (45 minutes)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students will understand the relation of the earth and the other planets within the solar system.
 - b. Students will understand the processes and interactions of the earth's systems and the structure and dynamics of Earth and other objects in space.
 - c. Students will understand the interrelationships among science, technology, and human activity and how they affect the world.
 2. Lesson Content
 - a. The nine planets (Mercury, Venus, Earth, mars, Jupiter, Saturn, Uranus, Neptune, Pluto)
 3. Skill Objective(s)
 - a. Students will demonstrate their learning of the planets in our solar system by completing a research project of an assigned planet.
- B. *Materials*
1. Our Planet Report packet (Appendix R which includes a chart and fact page) (distances from Sun, days it takes for the planet to orbit the sun, and the number of moons of each planet) (one copy for each student)
 2. Parent Letter (Appendix P) which includes the websites available to assist student research (one copy for each student)
 3. www.coollessons.org/spacecolony.htm
<http://kids.msfnasa.gov>
- C. *Key Vocabulary*
- None
- D. *Procedures/Activities*
1. The teacher will assign each student a planet for the research project.
 2. This research project is intended for homework, but can be done at school.
 3. Parents are encouraged to work with their child on this project to obtain the information to complete the report.
 4. Pass out Appendix R and go over requirements for the project.
- E. *Assessment/Evaluation*
1. The teacher will assess student learning by checking for accuracy and completeness of individual reports. Use the rubric in Appendix T to evaluate.

VI. CULMINATING ACTIVITY

- A. To wrap up the unit have students complete the final assessment (Appendix O).
- B. Watch the video The Magic School Bus Lost in the Solar System.

VII. HANDOUTS/WORKSHEETS

- A. Appendix A: Solar System Model
- B. Appendix B: Solar System Rhyme
- C. Appendix C: The Sun
- D. Appendix D: Mercury
- E. Appendix E: Venus
- F. Appendix F: Earth
- G. Appendix G: The Moon
- H. Appendix H: Mars
- I. Appendix I: Jupiter
- J. Appendix J: Saturn

- K. Appendix K: Uranus
- L. Appendix L: Neptune
- M. Appendix M: Pluto
- N. Appendix N: Solar System Coloring Book Cover
- O. Appendix O: Final Assessment (three pages)
- P. Appendix P: Parent Letter
- Q. Appendix Q: Rubric for the Solar System Coloring Book
- R. Appendix R: Planet Report Packet including Fact Chart (two pages)
- S. Appendix S: Assessment Key
- T. Appendix T: Planet Report Rubric

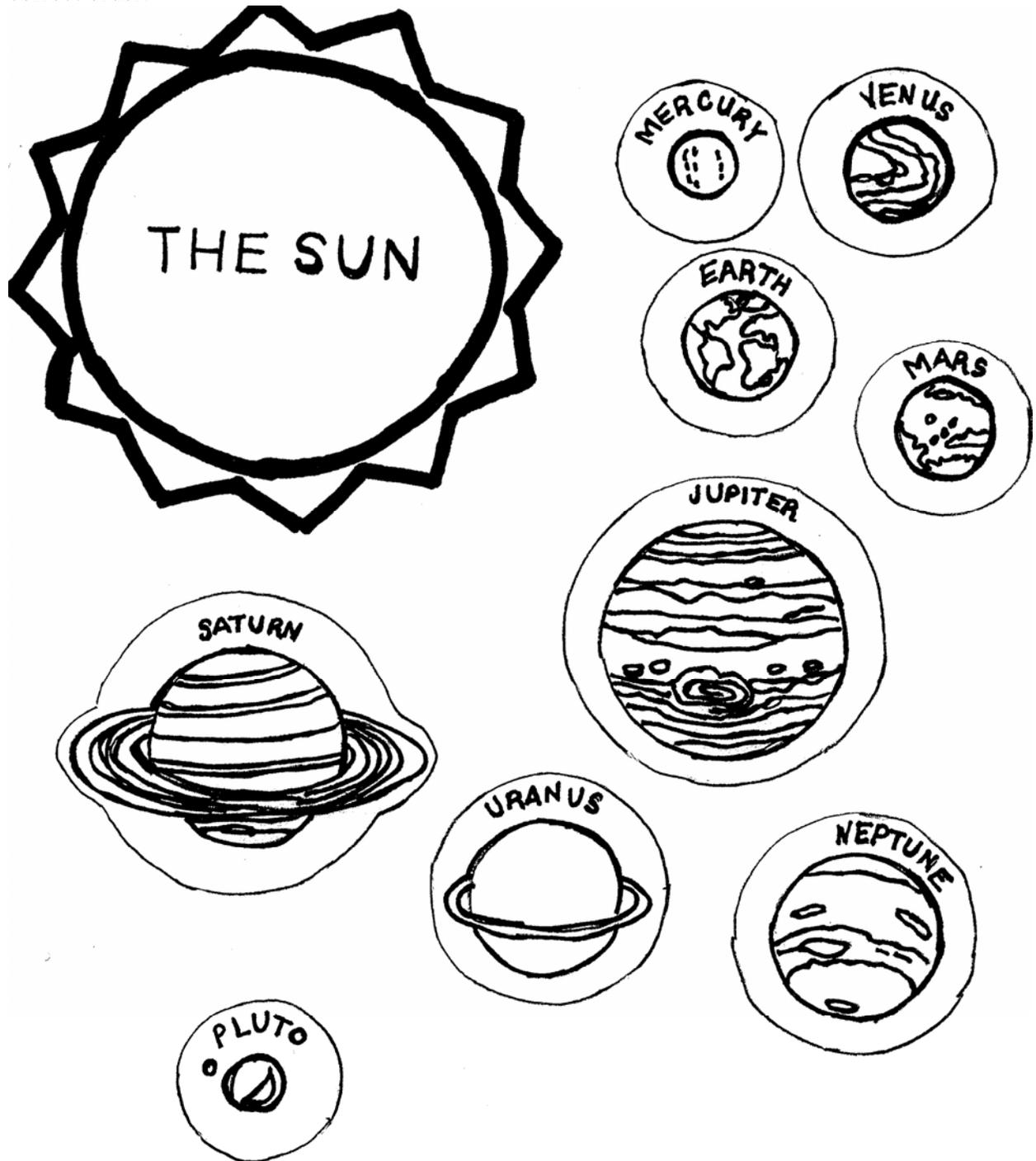
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Appendix A, page 1

Name: _____

Color the sun and the planets. Beginning with the sun, cut out and glue the sun and planets in the correct order.



(adapted from December Mailbox Magazine 1996)

Appendix B

My Very Educated Mother Just Served Us Nine Pizzas

Cut out rhyme and planet names. Glue the rhyme words and planet names on construction paper in the proper order.

MY

MARS

VERY

VENUS

EDUCATED

EARTH

MOTHER

MERCURY

JUST

JUPITER

SERVED

SATURN

US

URANUS

NINE

NEPTUNE

PIZZAS

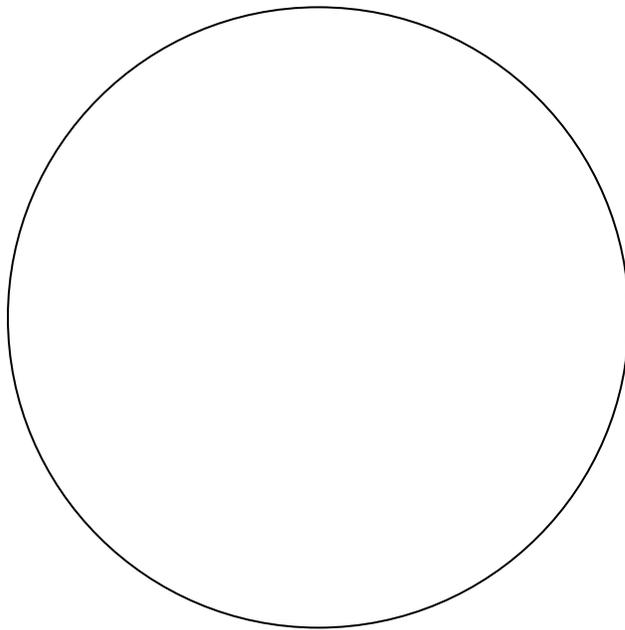
PLUTO

Appendix C

The Sun

The Sun is a star at the center of our solar system and controls the orbits of our planets. It gives off light and heat. The Sun is bigger than any of the planets. If the Sun were hollow, we could put over one million Earths inside!

The Sun is made up of burning, exploding gases. This burning circle is like a furnace- a giant fire that gives off energy to keep us warm and give us light. Without our Sun we would not be able to live on Earth.



Size: the Sun is wider than 100 Earths

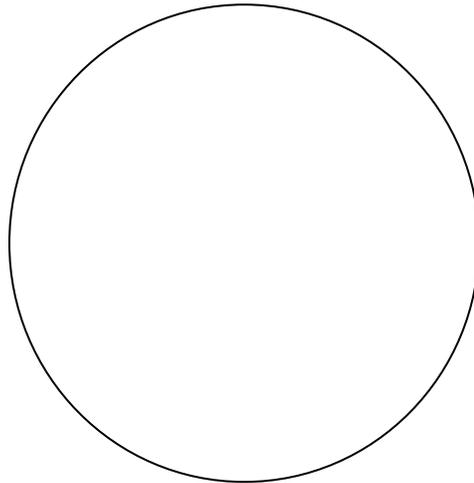
Temperature: 27,000,000° F at the surface, so that's really hot anywhere on the Sun

Appendix D

Mercury

Mercury is the planet closest to the Sun and the first planet in the solar system. Its grey surface is covered with craters, jagged mountains, and flat plains.

Scientists believe that one side of Mercury always faces away from the Sun and gets very, very hot. The other side is away from the Sun, gets very, very cold.



Size: about 1/3 as wide as the Earth

Temperature: -279° F to 800° F

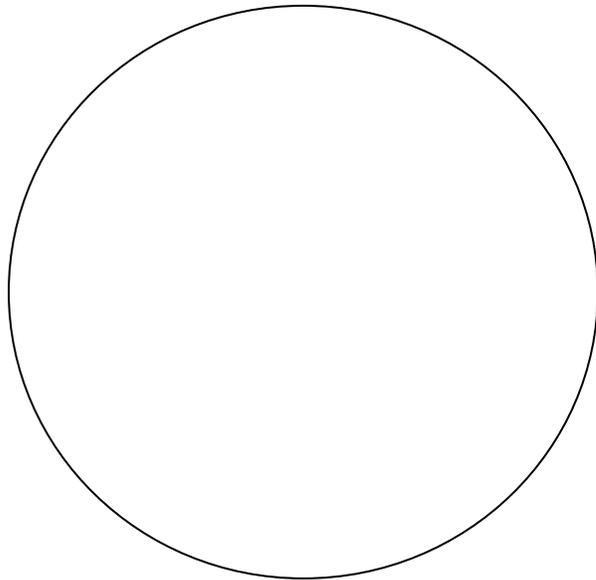
Number of Moons: 0

Mercury is a ball of rock.

Appendix E

Venus

Venus is the second planet in the solar system. Venus is covered by a thick layer of clouds. It has thick yellow clouds made of acid. The heat from the Sun reaches Venus, but the thick cloud layer traps heat inside. It is very, very hot on Venus.



Size: almost as big as Earth

Temperature: -890° F, Venus is very hot

Number of moons: 0

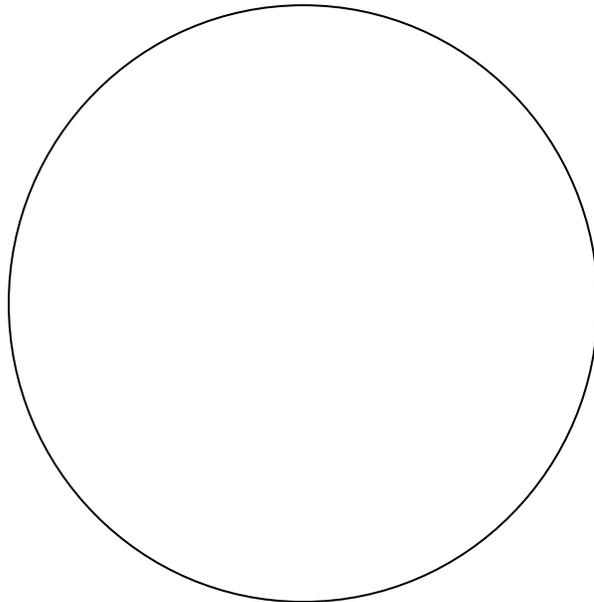
Venus is made up of mainly rock.

Appendix F

Earth

Earth is the third planet in our solar system. It is the fifth largest planet, but very small compared to the Sun.

It has water on the surface and air we can breathe. From space, Earth looks like a blue ball with land that is brown and green and clouds that are white.



Size: 7,926 miles

Number of moons: 1

Temperature: -130° F to 136° F, these temperatures can feel cold or hot, but mainly the temperature is great for life here on Earth

The Earth is mainly made of rock.

Appendix G

The Moon

Earth has one moon. It is much smaller than the Earth. It is only about the size of the United States. The Moon has been found to be lifeless, airless, and waterless.

During one month, we can see the different phases of the Moon. If the Moon is a full circle, it means the Earth is between the Moon and the Sun. If the Moon has another shape like a crescent, it means the Moon is in another place in its orbit around the Earth.

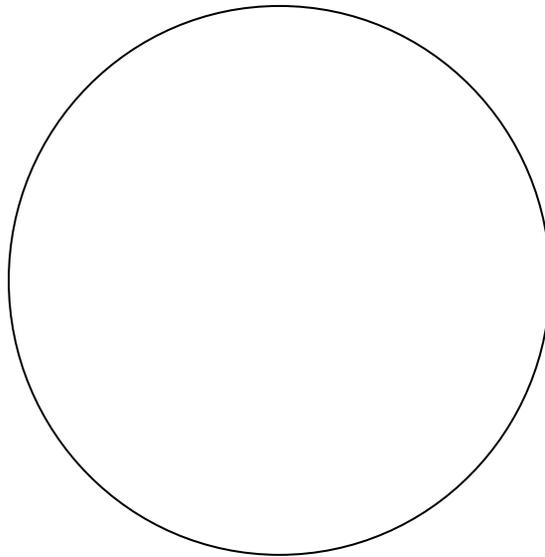
The Moon is covered by craters that were created by asteroids colliding with the surface.

Neil Armstrong was the first astronaut to walk on the Moon.

Appendix H

Mars

Mars is the fourth planet in our solar system. Mars is covered with red rocks. There are many huge volcanoes and lots of craters on the surface.



Size: about half as big as Earth

Number of moons: 2

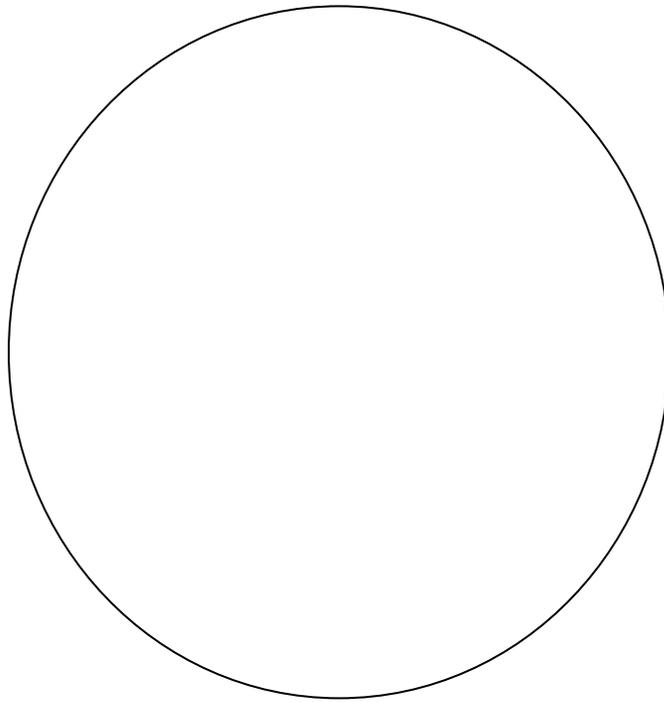
Temperature: -266° F to -62° F, so Mars is a pretty cold place

Mars is mainly made up of rocks.

Appendix I

Jupiter

Jupiter is the fifth planet in our solar system and the largest. Jupiter has no solid surface. It is a sea of liquid gases and very cold. It has a giant red spot larger than Earth that was caused by a gigantic storm. Jupiter is red, yellow, brown, and white. You can draw the big red spot in the picture.



Size: about 11 Earths across

Number of moons: 17

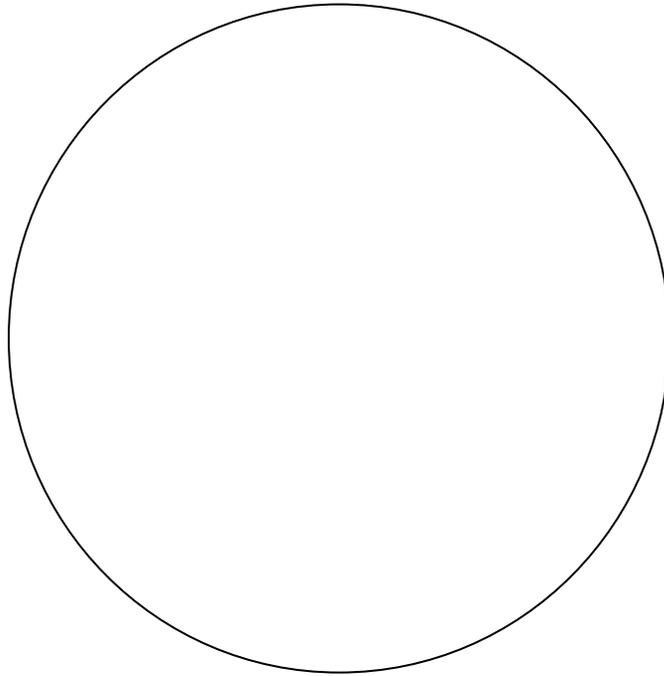
Temperature: -278° F, Jupiter is very cold

Jupiter is mainly made up liquid and gas, with a small rocky core.

Appendix J

Saturn

Saturn is the sixth planet in our solar system. It is the second largest planet and is nine times larger than the Earth. Saturn has beautiful rings. Saturn is gold, brown, and white. Its rings are gold, brown, white, red, yellow, and green.



Size: bigger than nine Earths across

Number of moons: 28

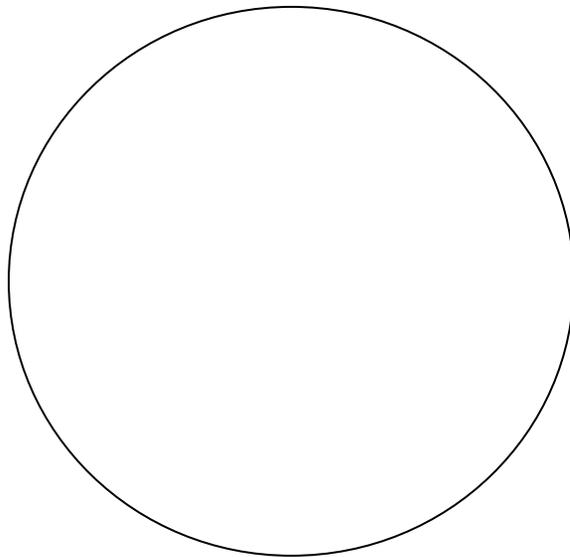
Temperature: -292° F, so Saturn is very cold

Saturn is mainly made up gas and liquid, with a rocky core.

Appendix K

Uranus

Uranus is the seventh planet in the solar system. The clouds that circle the planet are greenish-blue. Uranus rotates almost vertically instead of horizontally like the other planets. Uranus also has 11 thin rings that surround the planet.

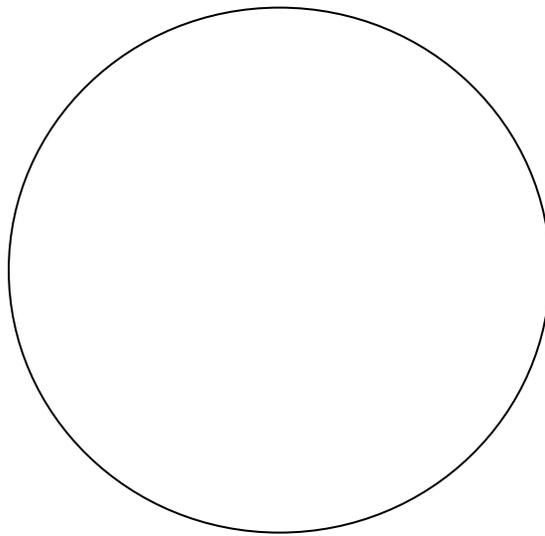


Size: Uranus is about four Earths across
Number of moons: 21
Temperature: -346° F, Uranus is super cold
Uranus is a ball of gas with a rocky core.

Appendix L

Neptune

Neptune is usually the eighth planet in the solar system. For a few years Pluto was actually closer to the Sun than Neptune. The planet is surrounded by blue clouds and dark rings.



Size: about four Earths across

Number of moons: 8

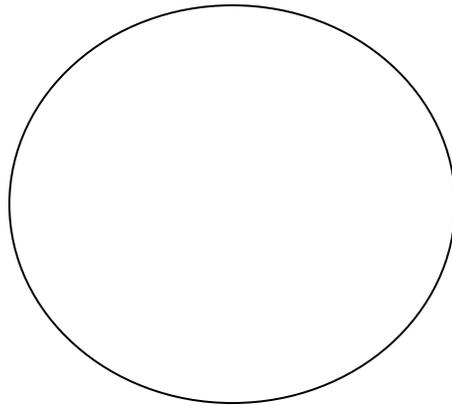
Temperature: -353° F, so Neptune is super cold

Neptune is a ball of gas with a metal core.

Appendix M

Pluto

Pluto is the smallest planet in our solar system. It is usually the farthest planet from the Sun. From 1979 through 1999, the orbit of Pluto came within the orbit of Neptune, so that Neptune was the farthest planets.



Size: a lot smaller than the Earth

Number of moons: 1

Temperature: -365° F, Pluto is ALWAYS cold

Pluto is a ball of frozen gas.

Appendix N

Our Solar System Book

Name: _____

Our Solar System Final Assessment

Name: _____

Word Bank: Sun Saturn Uranus Pluto Earth
Moon Mercury Venus Mars Jupiter Neptune

Use the words from the word bank to complete each sentence.

1. The _____ is the center of the universe.
2. _____ is the ninth planet in the Solar System.
3. _____ is the only planet that has life.
4. _____ is covered with craters made by asteroids.
5. _____ is the largest planet in the Solar System.
6. The planets orbit around the _____.
7. _____ is the third planet in the Solar System.
8. _____ is the first planet, and is the closest to the Sun.
9. _____ is known as the red planet.

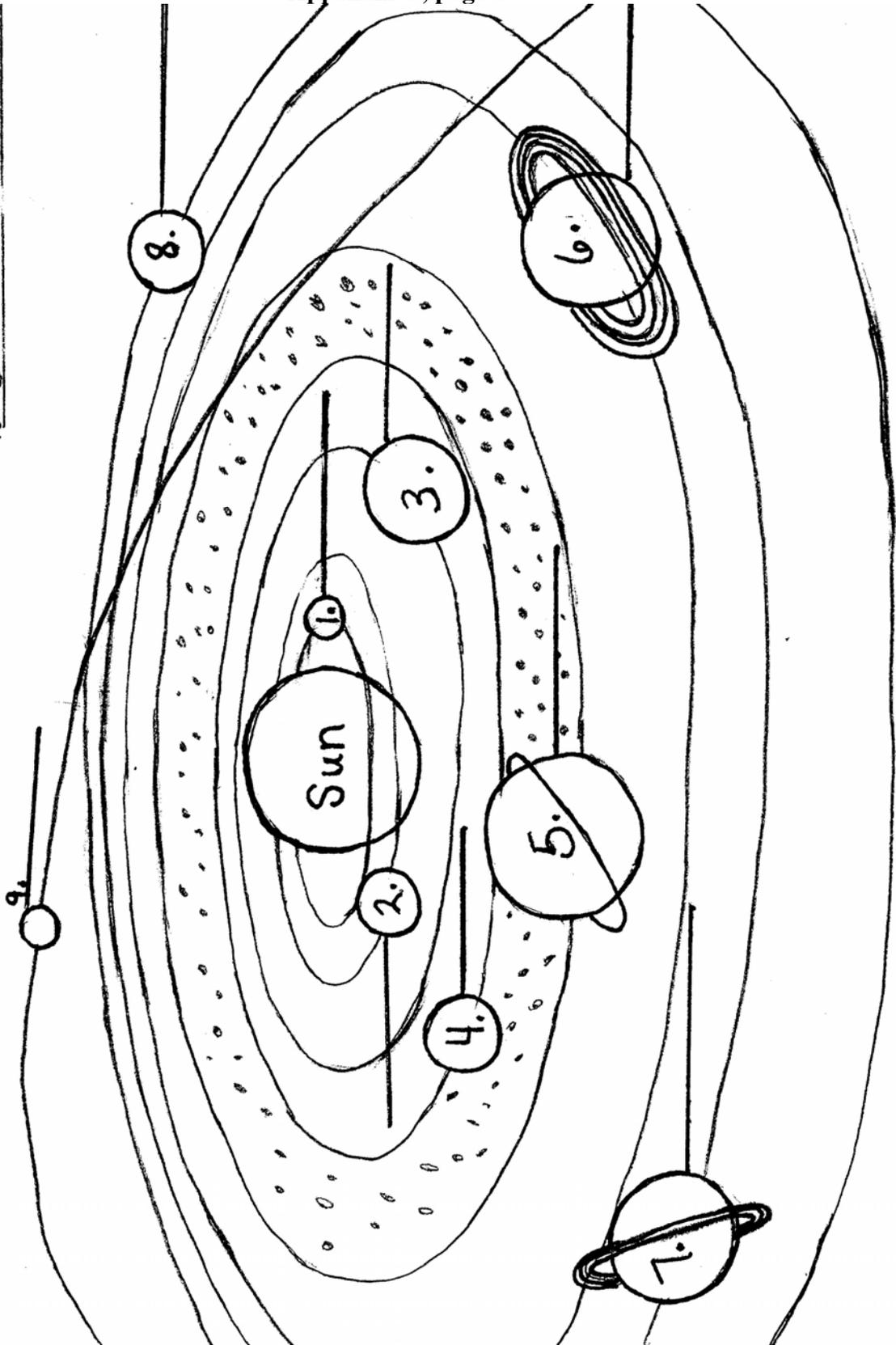
Appendix O, page 2

10. _____ is the sixth planet in the Solar System.
11. _____ is the second planet in the Solar System.
12. _____ is the eighth planet in the Solar System.

Draw your favorite planet below.

Word Bank: Saturn Uranus Pluto Earth Mercury Venus Mars Jupiter Neptune

Name: _____



Appendix P

Parent Letter

Dear Parents,

The first grade students are completing the unit study on the Solar System. They have chosen a planet to learn more about, and complete a fact-finding report. We have used two web sites:

www.coollessons.org/spacecolony.htm
<http://kids.msfc.nasa.gov>

to locate some information. I would like the students to complete the report over the weekend using any resources you have at home. Please help your child to complete the report and return it on Monday.

Thank you,

The First Grade Teacher

Appendix Q

My Solar System Coloring Book

Teacher Name: _____

Student Name: _____

CATEGORY	4 (Excellent)	3 (Good)	2 (Satisfactory)	1 (Below Average)
Following Directions	Follows all directions.	Follows five directions.	Follows three directions.	Follows one direction
Coloring	Student used all realistic colors.	Student used six realist colors.	Student used three realistic colors.	Student used one realistic color.
Completion of Tasks	Completed task during time allotted.	Completed seven tasks during allotted time.	Completed five tasks during allotted time.	Completed three tasks.
Acquired needed knowledge base by including physical landmarks within the drawing (i.e. craters, moons, rings)	Included all landmarks.	Included seven landmarks.	Included five landmarks.	Included three landmarks.
Participates in daily class discussions	Most of the time.	Some of the time.	Seldom participated.	Never participated.
Demonstrates knowledge of the Solar System by accurate completion of the coloring book	Finished all of the pages neatly and accurately.	Finished most of the pages of the book neatly and carefully.	Finished the pages satisfactorily.	Finished the pages poorly.

Our Planet Report



Name _____

Our report is about the planet _____.

The planet is _____ miles from the Sun.

_____ is the _____ planet

from the Sun.

This planet is _____ in color.

This planet has _____ moons. It takes

_____ for the planet to orbit around the

Sun.

If we could visit this planet, we might see:

Fact Chart for the Planets

The solar system consists of the entire family of planets, moons, asteroids, comets, meteors, and swirling dust and gases that circles the Sun. The Sun itself is more than 750 times as massive as the rest of the system combined. Its enormous pull of gravity locks everything within a range of over 6,000 million kilometers into orbit around it.

After the Sun, the most important members of the solar system are the nine planets. The chart below shows you some of the more important facts about each one. Planets' 'days' and 'years' vary because they spin at different speeds and move along in their orbits at varying rates. Pluto, for instance, rotates every 153 hours compared with Earth's rotation time of 23 hours 56 minutes, so Pluto's day is more than six times longer than Earth's.

Facts and Figures

Name of planet	Diameter in km	Average distance from Sun in million km	Number of known moons	Time taken to go around the Sun (year)	Time taken to turn on its axis (day)	Speed in orbit around the Sun in kps
Mercury	4,878	57.9	----	88 days	59 days	47.9
Venus	12,100	108	----	224.7 days	243 days	35
Earth	12,756	149.6	1	365.3 days	23 hours 56 minutes	29.8
Mars	6,790	227.9	2	687 days	24 hours 37.5 minutes	24.1
Jupiter	142,800	778	16	11.9 years	9 hours 50.5 minutes	13.1
Saturn	120,000	1,427	19	29.5 years	10 hours 14 minutes	9.6
Uranus	52,400	2,870	15	84 years	15 hours 14 minutes	6.8
Neptune	50,450	4,497	8	164.8 years	16 hours 3 minutes	5.4
Pluto	2,300	5,900	1	248.6 years	6 days 9 hours	4.7

Appendix S
Assessment Key

1. Sun
2. Pluto
3. Earth
4. Moon
5. Jupiter
6. Sun
7. Earth
8. Mercury
9. Mars
10. Saturn
11. Venus
12. Neptune

Appendix T

Research Report: My Planet Report

CATEGORY	4	3	2	1
Amount of Information	All information is reported accurately.	Five of the seven sentences are answered accurately.	Three of the seven sentences are answered accurately.	One of the seven sentences are answered accurately.
Quality of Information	Additional information clearly relates to the main topic. It includes several supporting details and/or examples.	Some additional information clearly relates to the main topic. It provides one-two supporting details and/or examples.	Little additional information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
Mechanics	No grammatical, spelling or punctuation errors.	Almost no grammatical, spelling or punctuation errors	A few grammatical spelling, or punctuation errors.	Many grammatical, spelling, or punctuation errors.
Internet Use	Successfully used suggested internet links to find information and navigates within these sites easily without assistance.	Usually able to use suggested internet links to find information and navigates within these sites easily without assistance.	Occasionally able to use suggested internet links to find information and navigates within these sites easily without assistance.	Needs assistance or supervision to use suggested internet links and/or to navigate within these sites.