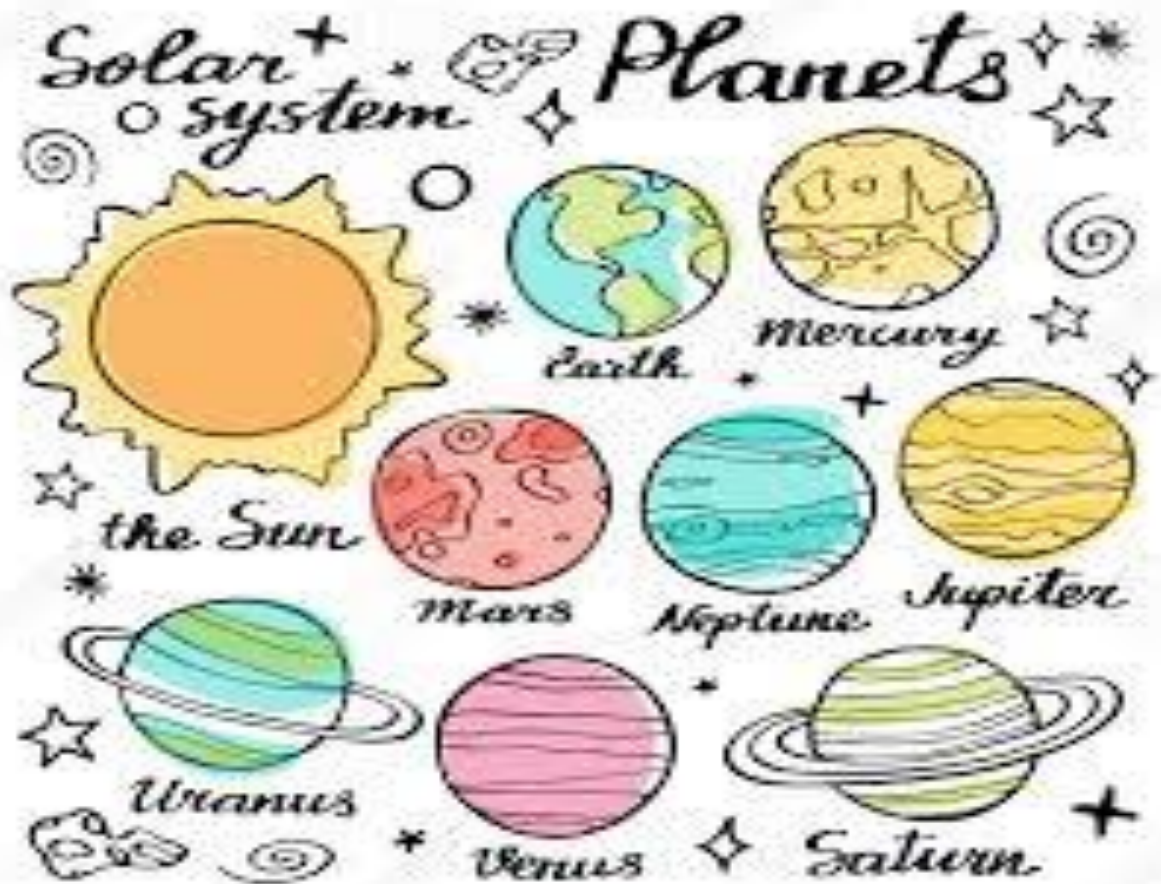


# The Solar System

## 4<sup>th</sup> Grade Unit Plan



Sarah Padula  
Science Methods  
Professor Harris

## Topic Solar System

### Established Goals:

1. Students will be able to identify the planets in order.
2. Students will be able to describe the orbit of the earth around the sun.
3. By creating their own solar system students will understand the role of an astronomer.

### Standards: 4<sup>th</sup> Grade

3.3.4.B1- Identify planets in our solar system and their basic characteristics. Describe the earth's in the solar system that includes the sun (a star), planets, and many moons.

### Big Ideas:

Planets

Earth

Astronomy

Orbit

Sun

Moon

### Essential Questions:

1. Why is the solar system important?
2. What are the planets?
3. What does orbit mean?
4. How is the moon involved in orbit?

### Enduring Understandings:

1. How to take the role of an astronomer.
2. How astronomers play a role in the solar system.
3. How Earth is impacted by the rotation of orbit.
4. How the solar system would be impacted if Earth did not orbit the sun.

### Students will know:

1. Grade level vocabulary associated with the solar system.
2. The names of the planets.
3. How orbit with the sun and moon are related.
4. Why astronomers are important.

### Students will be able to:

1. Know the characteristics of individual planets.
2. Create their own solar system.
3. Analyze planets the way an astronomer would.
4. Establish a statement on how the sun, moon, earth, and orbit all relay on each other.

## Science Unit Topic: Solar System

### **Science Unit Requisition Form** (assuming you have a class of 25 students)

Item Requested for this Science Unit	Rational for this equipment or supplies	Number of Items needed	Company where you will be ordering this equipment/supplies	Cost per unit	Total cost of this equipment or supply
Tarp	Planetarium	1	Lows	\$15	\$15
Fans	Planetarium	2	Walmart	\$20	\$40
Space Heater	Science Method Experiment	1	Walmart	\$10	\$10
24 Pack of Crayons	Science Method Experiment	1	Walmart	\$3	\$3
Balloons packs of 10	Build your own Solar System	25	Walmart	\$4	\$100
Paints	Decorate Planets	1	Walmart	\$5	\$5
				<b>Total</b>	<b>\$210</b>

## Calendar

<p>Day 1-What is the Solar System?</p> <p>Set: What is that solar system? (Video)</p> <p>Input: Read the essential questions. Explain the final project and pass out the rubric. Play the song on the solar system.</p> <p>Deepen: Solar System Foldable</p> <p>Closure: Coloring page and question for teacher</p>	<p>Day 2-Scientific Method on the Solar System</p> <p>Set: Miss Frizzle! Magic School Bus: Outer Space (Book)</p> <p>Input: Review the steps of the scientific method. What does the distance from the sun do to different planets?</p> <p>Deepen: Experiment</p> <p>Closure: How did you become an astronomer? (Exit Ticket)</p>	<p>Day 3- Inner and Outer Planets</p> <p>Set: Astronomy Crossword Puzzle</p> <p>Input: Take notes on Astronomy Unit and read the Inner and Outer Planets</p> <p>Deepen: NASA website on Solar System</p> <p>Closure: Build a Solar System handout</p>	<p>Day 4- Inner and Outer Continued</p> <p>Set: One word on how this unit makes the students feel. To make it fun make it a hashtag about the solar system. Each day for the rest of the week try to get one of them trending</p> <p>Input: Review the order of the planets and play the solar system song</p> <p>Deepen: Building the solar system</p> <p>Closure: How they are feeling about their project</p>	<p>Day 5-Moon/Sun</p> <p>Set: Matching Game- Planets to their characteristics</p> <p>Input: Videos on sun and moon with direct instruction after the movies</p> <p>Deepen: Sun/Earth/Moon play (how each of this relay one each other and what they do)</p> <p>Closure: One on one meetings ask any questions about their projects or any questions about the unit so far</p>
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<p>Day 6- Planetarium</p> <p>Set: Quick overview of what a planetarium is and what they can look for</p> <p>Input: Small groups visit the planetarium with the teacher</p> <p>Deepen: Work on play</p> <p>Closure: Bingo on the Solar System</p>	<p>Day 7- Earth Orbits the Sun</p> <p>Set: Earth Orbits the Sun (Video)</p> <p>Input: Act out the orbiting with direct instruction</p> <p>Deepen: Work on Solar Systems</p> <p>Closure: Quick draw how the Earth/Sun/Moon all orbit each other.</p>	<p>Day 8- Work Day on Solar System</p> <p>Set: Tell the class things going well about your project</p> <p>Input: Go over rubric for questions</p> <p>Deepen: Pair up with a different play group and brainstorm ideas to help with an issue your group is having</p>	<p>Day 9- Present Play</p> <p>Set: Go over the vocab words that need to be used in the play</p> <p>Input: Play</p> <p>Closure: After each group, the students will write one GLOW (like the stars) that each group did well on.</p>	<p>Day 10- Present Solar System</p> <p>Set: Anonymously read the GLOWS</p> <p>Input: Present solar system</p> <p>Closure: Group discussion on what went well and what can be changed for next year's unit.</p>
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Student Teacher Candidate: Sarah Padula

Lesson Subject(s)/Title:

Lesson Date(s): Day 1

Course & Grade(s): 4<sup>th</sup> Grade Solar System

### INSTRUCTIONAL MATERIALS:

- YouTube Video
  - <https://www.youtube.com/watch?v=libKVRa01L8>
    - Solar System Video
  - <https://www.youtube.com/watch?v=mQrlgH97v94>
    - Planet song
- Foldable
- [https://www.momjunction.com/articles/solar-system-coloring-pages\\_00394784/#gref](https://www.momjunction.com/articles/solar-system-coloring-pages_00394784/#gref)
  - Coloring Page

### ESSENTIAL QUESTIONS/ SUBSIDIARY QUESTIONS:

- Why do we study the Solar system?
- What are the planets?
- What does orbit mean?
- How is the moon involved in orbit?

### PURPOSE:

- The purpose of this lesson is to introduce students to the concept of the Solar System.
- I will prepare them to have a better understanding of the essential questions.

### SPECIFIC LEARNING OBJECTIVES: (clear, observable)

- Students will be able to answer "What is the Solar System"
- Use the rubric as the assistance for their product (Solar System)

### STANDARDS:

- 3.3.4.B1- Identify planets in our solar system and their basic characteristics. Describe the earth's in the solar system that includes the sun (a star), planets, and many moons.

### DIFFERENTIATION STRATEGIES:

- The teacher will pull students with comprehension problems aside to go through the rubric with them. They will also send an email to the parents with the rubric, so they have one on hand to revert to at home.
- Gifted students will be held to a higher standard in their writing and their vocabulary throughout the lesson.

### ANTICIPATORY SET:

- <https://www.youtube.com/watch?v=libKVRa01L8>
  - This video will be very broad on the planets to get them interested in the planets

Sensory Register	STM	LTM
Attention	Focus	Connections
Recognition	Organization	Elaborations
Perception	Rehearsal	Meaning
	Visualization	

### Facets of Understanding

1. Explanation
2. Interpretation
3. Application
4. Perspective
5. Empathy
6. Self-Knowledge

### Multiple Intelligences

1. Linguistic [words]
2. Visual [pictures]
3. Mathematical [numbers & reasoning]
4. Kinesthetic [hands-on]
5. Musical [music]
6. Interpersonal [social]
7. Intrapersonal [self]
8. Naturalist [nature]

### Multiple Exposures [4 x 2]

1. Dramatization
2. Visualization
3. Verbal

### Complex Interactions

1. Discussion
2. Argumentation

### Bloom's Taxonomy

1. Knowledge [Verbatim]
2. Comprehension [Own Words]
3. Application [Problem-Solving]
4. Analysis [Identify components]
5. Synthesis [Combine information]
6. Evaluation [Decisions]

### Aspects of the Topic

1. Facts
2. Compare
3. Cause/Effect
4. Characteristics
5. Examples
6. Relationships

### 9 Effective Strategies

1. Similarities and Differences
2. Summarization and Note Taking
3. Reinforcing Effort and Providing Recognition
4. Homework and Practice
5. Nonlinguistic Representations
6. Cooperative Learning
7. Setting Objectives and Providing Feedback
8. Generating and Testing

**INPUT/ ACQUIRE NEW KNOWLEDGE:**

- Discuss the Solar System
  - Read through the essential questions and the goals so the students know what will happen this week
- Go over the rubric for the 2 end projects
  - Play and Solar System
- Play the Solar System song
  - <https://www.youtube.com/watch?v=mQrlgH97v94>

**APPLY/ DEEPEN NEW KNOWLEDGE:**

- Foldable that will be a visual for the students to reference to during the unit

**CLOSURE/ASSESSMENT:**

- Coloring page that they will write a question on the back of about the solar system. The teacher will hang the pictures up around the room.

**HOMEWORK: (Purpose- Preparation, Practice, Expansion)**

- N/A

**EVALUATION/ASSESSMENT OF STUDENTS:**

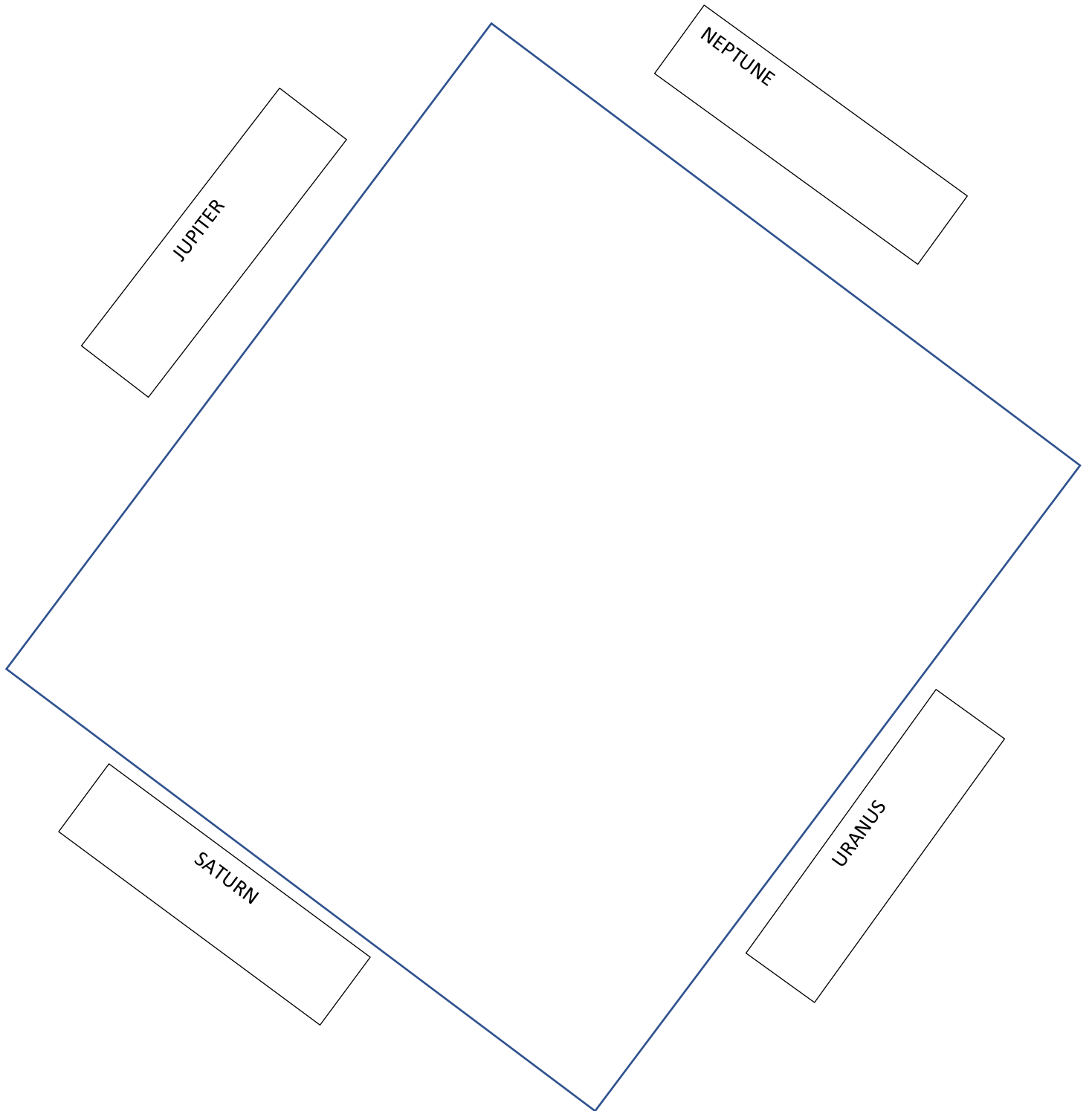
- Question that the students turn in and observation

**INSTRUCTIONAL PROCEDURES:**

**Time:**

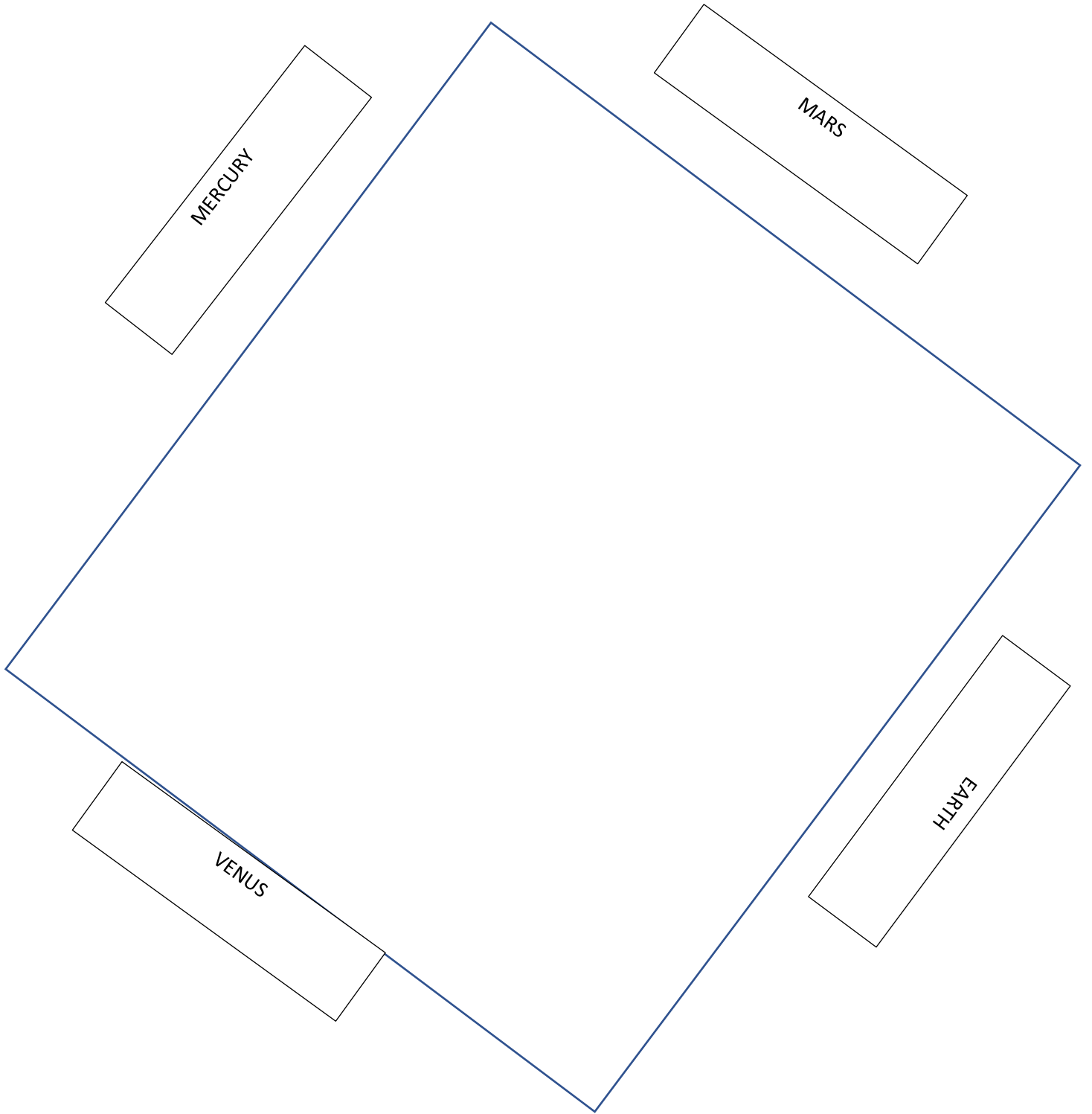
<p>The teacher will:</p> <ol style="list-style-type: none"><li>1. Intro to the lesson and solar system video</li><li>2. Have a power point slide with the title Solar System and the essential questions and goals</li><li>3. Show the models of the solar system and play and explain that the students will be making them too</li><li>4. Pick play groups</li><li>5. Ask for questions</li><li>6. Play the Solar System song</li><li>7. Handout foldable</li><li>8. Walk through each step and explain the reasoning for this project</li><li>9. Handout coloring pages for the classroom and explain they will be put up around the room so keep them neat and the question on the back</li></ol>	<p>The students will:</p> <ol style="list-style-type: none"><li>1. Watch video</li><li>2. Listen to the teacher explain the unit and start to think of answers</li><li>3. Brainstorm silently of ideas and what they would want to do</li><li>4. Listen to their groups</li><li>5. Ask questions</li><li>6. Listen to the solar system song take notes if wanted</li><li>7. Step by Step on the foldable</li><li>8. Coloring pages</li></ol>
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# GAS GIANTS





# TERRESTRIAL PLANETS



Student Teacher Candidate: Sarah Padula

Lesson Subject(s)/Title: Solar System

Lesson Date(s): Day 2

Course & Grade(s): 4<sup>th</sup> Grade Science

### INSTRUCTIONAL MATERIALS:

- Magic School Bus book
- Science Method Sheet
- Space Heater
- Crayon Planets

### ESSENTIAL QUESTIONS/ SUBSIDIARY QUESTIONS:

- Why do we study the solar system?
- What are the planets?
- What does orbit mean?
- How is the moon involved in orbit?

### PURPOSE:

- The purpose of this lesson is for students to utilize the scientific method this will help them link inquiry science into their learning of the Solar System.

### SPECIFIC LEARNING OBJECTIVES: (clear, observable)

- List the steps of the scientific method
- Write a hypothesis using these steps

### STANDARDS:

- 3.3.4.B1- Identify planets in our solar system and their basic characteristics. Describe the earth's in the solar system that includes the sun (a star), planets, and many moons.

### DIFFERENTIATION STRATEGIES:

- For a student who is learning support I will place them in a group that isn't gifted, so they have a chance to talk and ask questions without feeling overwhelmed

### ANTICIPATORY SET:

- Read Miss Frizzle the Magic School Bus: Outer Space
  - Allow the students to sit wherever they would like this way they will be comfortable

### INPUT/ ACQUIRE NEW KNOWLEDGE:

- Handing out the scientific method handout and reviewing the scientific method
- The teacher will go over the experiment and ask them to hypothesize at their tables what will happen at each planet as the heater gets closer

Sensory Register	STM	LTM
Attention	Focus	Connections
Recognition	Organization	Elaborations
Perception	Rehearsal	Meaning
	Visualization	

### Facets of Understanding

7. Explanation
8. Interpretation
9. Application
10. Perspective
11. Empathy
12. Self-Knowledge

### Multiple Intelligences

9. Linguistic [words]
10. Visual [pictures]
11. Mathematical [numbers & reasoning]
12. Kinesthetic [hands-on]
13. Musical [music]
14. Interpersonal [social]
15. Intrapersonal [self]
16. Naturalist [nature]

### Multiple Exposures [4 x 2]

4. Dramatization
5. Visualization
6. Verbal

### Complex Interactions

3. Discussion
4. Argumentation

### Bloom's Taxonomy

7. Knowledge [Verbatim]
8. Comprehension [Own Words]
9. Application [Problem-Solving]
10. Analysis [Identify components]
11. Synthesis [Combine information]
12. Evaluation [Decisions]

### Aspects of the Topic

7. Facts
8. Compare
9. Cause/Effect
10. Characteristics
11. Examples
12. Relationships

### 9 Effective Strategies

10. Similarities and Differences
11. Summarization and Note Taking
12. Reinforcing Effort and Providing Recognition
13. Homework and Practice
14. Nonlinguistic Representations
15. Cooperative Learning
16. Setting Objectives and Providing Feedback
17. Generating and Testing

**APPLY/ DEEPEN NEW KNOWLEDGE:**

- Students will recall the order of the planets and place them in order
- Students will observe the teacher moving the heater (the sun)
- Come back as a class and discuss their findings and see if their hypothesis is correct

**CLOSURE/ASSESSMENT:**

- Exit Ticket- Students will complete and turn in the ticket to answer “How did you become an astronomer during the experiment?”

**HOMEWORK: (Purpose- Preparation, Practice, Expansion)**

N/A

**EVALUATION/ASSESSMENT OF STUDENTS:**

- Observation throughout the experiment
- Their participation in class and their groupwork

**INSTRUCTIONAL PROCEDURES:**

**Time:**

The teacher will:	The students will:
1. Read Magic School Bus	1. Get comfy
2. Pass out science method sheet	2. Look over handout
3. Review scientific method	3. Listen or write down the scientific method
4. Explain the experiment to the students	4. Listen to the experiment
5. Have groups for a hypothesis	5. Write hypothesis in your small group
6. Go over the safety of the experiment	6. MAKE SURE YOU LISTEN TO THE SAFTEY
7. Rotate each group while they are not at the experiment, they can work on their unit projects	7. Rotate to the group when called upon or work on your other unit projects
8. Ask to put planets in order (closest to the farthest from the sun)	8. Place planets in order as a group
9. Explain how an astronaut would observe and have the students get into that mindset	9. Observe as an astronaut
10. Complete the experiment	10. Tell the class your findings
11. Talk as a class about each group’s findings	11. Decide if your hypothesis is accepted or refused
12. Refuse or Accept their hypothesis	12. Complete exit ticket and turn in to teacher
13. Exit Ticket	

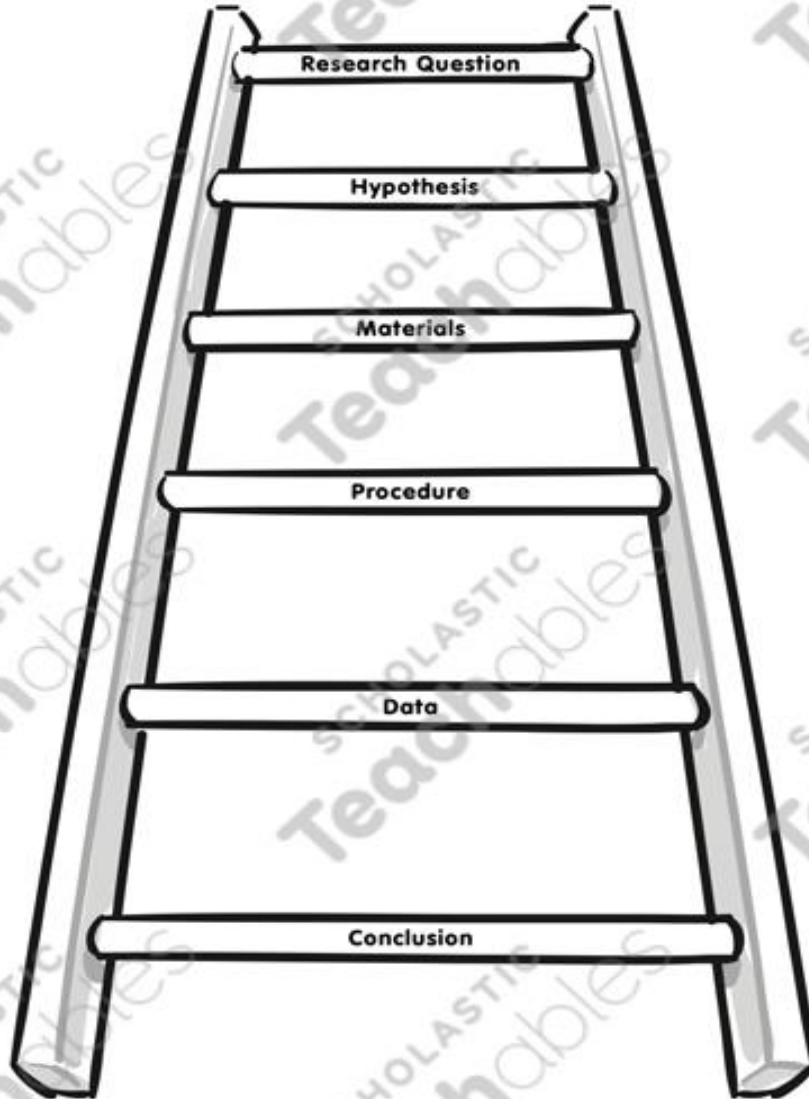
Based off the experient with the class and teacher fill in each step of the scientific method.

Name \_\_\_\_\_

Date \_\_\_\_\_

# Steps of the Scientific Method

Use this graphic organizer to plan your science experiment.



Student Teacher Candidate: Sarah Padula

Lesson Subject(s)/Title: Solar System

Lesson Date(s): Day 6

Course & Grade(s):

### INSTRUCTIONAL MATERIALS:

- Planetarium
- Fans
- Bingo

### ESSENTIAL QUESTIONS/ SUBSIDIARY QUESTIONS:

- Why is the solar system important?
- What are the planets?
- What does orbit mean?
- How is the moon involved in orbit?

### PURPOSE:

- The purpose of this lesson is for the students to assume the role of an astronaut while going in the planetarium to observe the constellations.

### SPECIFIC LEARNING OBJECTIVES: (clear, observable)

- Demonstrate their understanding of the planetarium based off the conversation inside and the questions the teacher asks the students.

### STANDARDS:

- 3.3.4.B1- Identify planets in our solar system and their basic characteristics. Describe the earth's in the solar system that includes the sun (a star), planets, and many moons.

### DIFFERENTIATION STRATEGIES:

- For students who cannot go in the planetarium the teacher will supply a paper that has the constellations, and they can connect the dots

### ANTICIPATORY SET:

- Go over the shapes of the constellation
- Go over how stars are formed

### INPUT/ ACQUIRE NEW KNOWLEDGE:

- The students will know how stars are formed
- The teacher will look up 3 different types of the constellations and find how they were formed

Sensory Register	STM	LTM
Attention	Focus	Connections
Recognition	Organization	Elaborations
Perception	Rehearsal	Meaning
	Visualization	

### Facets of Understanding

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14. Interpretation
15. Application
16. Perspective
17. Empathy
18. Self-Knowledge

### Multiple Intelligences

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18. Visual [pictures]
19. Mathematical [numbers & reasoning]
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### 9 Effective Strategies

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22. Homework and Practice
23. Nonlinguistic Representations
24. Cooperative Learning
25. Setting Objectives and Providing Feedback
26. Generating and Testing

**APPLY/ DEEPEN NEW KNOWLEDGE:**

- The students will know how stars are formed and how the placement of the stars make up shaped called constellations
- They will also know that different stars come out at different parts of the year
- The student who are not in the planetarium at the time will work on the unit projects

**CLOSURE/ASSESSMENT:**

- Bingo

**HOMEWORK: (Purpose- Preparation, Practice, Expansion)**

- N/A

**EVALUATION/ASSESSMENT OF STUDENTS:**

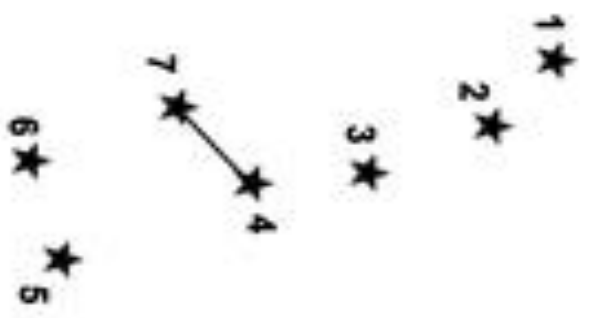
**INSTRUCTIONAL PROCEDURES:**

**Time:**

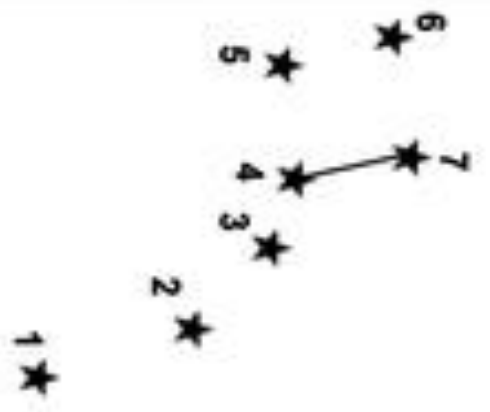
<p>The teacher will:</p> <ol style="list-style-type: none"><li>10. Talk about the steps for the lesson</li><li>11. Break the students into groups</li><li>12. Take each group into the planetarium</li><li>13. Talk about the stars and how they form/ point out different constellations/have the students try and find different start formations</li><li>14. Bingo</li></ol>	<p>The students will:</p> <ol style="list-style-type: none"><li>13. Listen to the steps to not be confused</li><li>14. Get into groups</li><li>15. Follow teacher to the planetarium (if you are not going work on unit projects)</li><li>16. Answer the teacher's questions in the planetarium</li><li>17. Play Bingo</li></ol>
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Leo



Big Dipper



Little Dipper



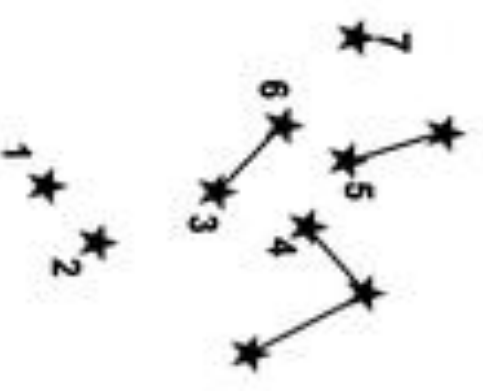
Cassiopeia



Cancer



Cygnus



Hercules

Cepheus

