A Closer Look of the Inner and Outer Planets

In this lesson, students will research properties of the inner and outer planets in our Solar System. They will organize their research by creating a Solar System poster that displays a comparison between the planets.

Learning Objectives: What should students know and be able to do as a result of this lesson?

- The students will be able to compare and contrast the properties of the inner and outer planets by answering the guiding questions listed below.
- The student will be able to write information and ideas clearly in an informative text about the inner and outer planets in our Solar System.

Prior Knowledge: What prior knowledge should students have for this lesson?

Students should know that the Earth is part of our solar system. They should be familiar with the Sun and know that the 8 planets in our Solar System orbit the Sun.

Guiding Questions: What are the guiding questions for this lesson?

1. Which planets are located closest to the sun?
2. Which planets are located farthest from the sun?
3. What do you think the temperature is on the planets closest to sun? Why?
4. Where is Earth located? Is it an inner or outer planet?
5. Which planets are the inner planets?
6. Which planets are the outer planets?
7. Which of the planets have a moon? If so, how many moons does each planet have?
8. What is the mass on the planet?
9. Does the planet have rings? 
10. Is the planet a rocky or gas giant? 
11. What is the diameter of the planet? 
12. What is the average distance of the planet from the sun? 
13. What is the atmospheric composition of the planet? 
14. What is the planet's axis of rotation? 
15. What is the length of “day” on the planet? 
16. What is the average temperature on the planet? 
17. What is the temperature on the sunny side of the planet compared to the dark side of the planet?

**Teaching Phase: How will the teacher present the concept or skill to students?**

- Engage students with the “K” (what they already know) of the KWL chart (there is an KWL chart attached to the lesson in the Formative Assessment section if needed). If students struggle with ideas, you may ask the following questions as examples to engage them in completing the K of their charts:
  - “What do you know about the inner and outer planets in our Solar System?”
  - “Do you know all 8 planets in the Solar System?”
  - “What is the name of the Solar System in which we live?”
  - “What is the furthest planet from the Sun?”
  - “What is the closest planet to the Sun?”
  - “Where is the Earth located?”

- Students write their ideas in their science notebook and then they can share out their ideas as the teacher records for the whole class to see (on the board or document camera).

- Students will write down their ideas and ideas of their classmates in their science notebook to keep record of what was discussed. As they research the inner and outer planets, the students can add what they have learned (and now know) in their science notebook.

- Teacher can show a video or a visual so that the students can visualize the planets.

- Students should now complete the “W” (what they want to know) of the KWL chart. Students write their ideas in their science notebook and then they can share out their ideas as the teacher records for the whole class to see. Students will write down their ideas and ideas of their classmates in their science notebook to keep record of what was discussed.

- Some example topics to keep students focused on the aligned standard would be:
  - What characteristics do the inner planets have?
  - What characteristics do the outer planets have?
  - How are they different? Why are they different?
  - What characteristics does Earth have?

- Teacher note: You may choose to use some or all of the guiding questions here as well.

**Guided Practice: What activities or exercises will the students complete with teacher guidance?**

- The students will work in small groups of 2-3 (depending on computer access available) to research all of the 8 planets in the Solar System. To keep the students focused on the aligned standard and the Guiding Questions you may choose to use the attached Inner and Outer Planet Research Handout for students to record and organize their research.

- Resources for students use when researching the inner and outer planets:
  - NASA: Solar System Exploration
  - Planets for Kids
  - School/classroom library

- Then the students will work in their groups to complete a Venn Diagram comparing one inner and one outer planet. In the Venn Diagram, the students should write specific properties that make the inner and outer planets similar and different. Suggestion: The teacher can assign student groups a specific characteristic to compare if desired.

**Independent Practice: What activities or exercises will students complete to reinforce the concepts and skills developed in the lesson?**

- Using the research they’ve conducted, their KWL Charts, their Venn Diagrams, and their Inner and Outer Planet Research Handout students will work individually to create a solar system poster.

- The attached Student Checklist can be used with the students to keep them on track and aware of the teachers expectations.

- Students should be sure to include the following on their posters:
  - An illustration of each planet (inner and outer).
  - Specific defining characteristics for each planet (should include the information from the Inner and Outer Research Handout and anything else they’ve learned)
  - Include facts, definitions, concrete details, quotations, or other information and examples related to the planets.
  - Use domain-specific vocabulary to inform about or explain about each planet.
  - A creative approach to displaying their work.

**Closure: How will the teacher assist students in organizing the knowledge gained in the lesson?**

- The teacher will display the Solar System posters throughout the room so students can review one another’s work. Allow ample time for students to read and view each others posters.

- Once the students have reviewed each others work bring the students together whole group to discuss what they’ve learned.

- Students should now complete the “L” (what they learned) of the KWL chart. Students write their ideas in their science notebook and then they can share out their ideas as the teacher records for the whole class to see. Students will write down their ideas and ideas of their classmates in their science notebook to keep record of what was discussed.

**Summative Assessment**

Students will use the Venn Diagrams they completed along with their research (organized into their KWL charts) to create a Solar System poster comparing an inner and outer planet of their choosing. The teacher can use the Poster Rubric to measure the students development of their Solar System posters. This attached Student Checklist can be shared with students to keep them on track (blank sections are included on the student checklist for teachers to easily add their own items).

**Formative Assessment**

- The teacher can start the lesson with a KWL Chart graphic organizer that will be completed by the students. The students can create their own KWL charts in their
science notebooks or the following KWL attachment can be used. This will assist the teacher in gaining insight about what the students know and what they want to know about the inner and outer planets.

- The teacher can create a KWL chart on the board as students work on their own about the inner and outer planets. The teacher will be able to see how developed the student's background knowledge of this topic is. This will also allow the teacher to see what the students want to learn to engage them further in the lesson. The teacher can use the Guiding Questions listed below to engage students thinking on this topic.
- The K-W-L is an introductory strategy that provides a structure for recalling what students know about a topic, noting what students want to know, and finally listing what has been learned and is yet to be learned. The K-W-L strategy allows students to take inventory of what they already know and what they want to know. Students can categorize information about the topic that they expect to use.

Feedback to Students

- Each student will conduct research on the inner and outer planets in our Solar System and create a Solar System poster to organize their research.
- They will describe the characteristics of each planet in the Solar System.
- The teacher should circulate and ask the students probing questions based on the planets they are researching. Questioning the students as they work will keep them on track and assist with any struggling learners. (see Guiding Questions) be sure to ask students if they included an answer for each guiding question on their Solar System poster for each planet.
- Resources for students use when researching the inner and outer planets:
  - NASA: Solar System Exploration
  - Planets for Kids
  - School/classroom library

Accommodations & Recommendations

Accommodations:

- ESOL students may draw the common characteristics and use pictures of the planets to group them together.
- Students with disabilities may need the planets cut out for them and the common characteristics typed. They can place or glue the pre-cut planets and characteristics on the Venn Diagram.

Extensions:

An appropriate extension for this lesson, tied to both of the aligned standards would be a writing assignment addressing the following prompt.

“If you could live on any other planet besides Earth which one would you choose and why?”

Be sure to include details for how you will survive based on your research on atmospheric conditions and common characteristics of the planet. For example, if the planet has extreme temperatures or limited oxygen how might you ensure your survival?

Students can be as creative as they'd like when responding to this prompt.

Suggested Technology: Computer for Presenter, Computers for Students

Special Materials Needed:

- Poster paper (one per student)
- construction paper
- crayons
- markers
- chart paper
- glue
- KWL Chart (attached)
- Venn-diagram (attached)
- Inner and Outer Planet Research Handout (attached)
- Student Checklist (attached)
- Poster Rubric (attached)
- computer/library access

Source and Access Information

Contributed by: Vanessa Brewster
Name of Author/Source: Vanessa Brewster
District/ Organization of Contributor(s): Seminole
Is this Resource freely Available? Yes
Access Privileges: Public
License: CPALMS License - no distribution - non commercial
<table>
<thead>
<tr>
<th>SC.5.E.5.2:</th>
<th>Recognize the major common characteristics of all planets and compare/contrast the properties of inner and outer planets.</th>
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</thead>
<tbody>
<tr>
<td>LAFS.5.W.1.2:</td>
<td>Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</td>
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<tr>
<td></td>
<td>a. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.</td>
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<td></td>
<td>b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.</td>
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<td></td>
<td>c. Link ideas within and across categories of information using words, phrases, and clauses (e.g., in contrast, especially).</td>
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<td></td>
<td>d. Use precise language and domain-specific vocabulary to inform about or explain the topic.</td>
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<td></td>
<td>e. Provide a concluding statement or section related to the information or explanation presented.</td>
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