

# The Planets

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<b>Strand</b>	Earth Patterns, Cycles, and Change
<b>Topic</b>	Investigating the planets
<b>Primary SOL</b>	4.7 The student will investigate and understand the organization of the solar system. Key concepts include a) the planets in the solar system; b) the order of the planets in the solar system; c) the relative sizes of the planets.
<b>Related SOL</b>	4.1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which b) objects or events are classified and arranged according to characteristics or properties; i) data are collected, recorded, analyzed, and displayed using bar and basic line graphs; k) data are communicated with simple graphs, pictures, written statements, and numbers.

## Background Information

Our solar system is made up of eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. These planets can be divided into terrestrial planets (Mercury, Venus, Earth, and Mars) and gaseous planets (Jupiter, Saturn, Uranus, and Neptune).

The smallest planet is Mercury, which is closest to the sun. Venus is the second from the sun. It is similar to Earth in size and mass, but it is so hot, that lead would melt on its surface. The third from the sun is Earth. Its distance from the sun allows it to have liquid water and an atmosphere suitable for life. The fourth from the sun is Mars. There is evidence that Mars once had water. The fifth from the sun is Jupiter. It is the largest planet, is made of gases, and it does not have a solid surface. The sixth from the sun is Saturn. It was once thought that Saturn was the only planet with rings. However, it is now known that all of the gaseous planets have rings. The seventh planet is Uranus and the eighth is Neptune, both gaseous.

Pluto is no longer considered a planet due to its size and irregular orbit, and thus has been reclassified as a dwarf planet. The eight planets, arranged from largest to smallest are: Jupiter, Saturn, Uranus, Neptune, Earth, Venus, Mars, and Mercury.

## Materials

- A book or video on the planets in the solar system
- Copies of the attached Planet Data Table for each student
- Various up-to-date resources for planets
- Art supplies such as round Styrofoam balls, cotton balls, pipe cleaners, clay, coat hangers, wooden blocks, etc.

## Vocabulary

*Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, dwarf planet, Pluto, terrestrial planet, gaseous planets, diameter, celestial body, ring system*

## Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

### Introduction

1. Read a book or show a video about the planets in the solar system to the class. (*Note: Ensure that this source does not include Pluto as the ninth planet.*)
2. Ask the students what they know about Pluto. Discuss with them the classification of Pluto as a dwarf planet and tell them that the students are going to learn more about the other planets to determine if there any other surprises. Be sure to point out that the change in Pluto’s status as a planet is a good example of how science changes when we learn new facts (part of the nature of science.)

### Procedure

1. Place students into groups of three to four students.
2. Give each group reference materials and a copy of the attached Planet Data Table.
3. Allow groups to work together to fill in the table.
4. When students are done with their charts, have each group create a physical model of our solar system, focusing on the order of the planets and the different sizes of the planets. Students can use any art supplies to represent the different planets and their order from the Sun.

### Conclusion

1. When students have finished creating their models, have students share one interesting fact they learned from their research or designing their model with the class.
2. Have students double-check the facts on their fact sheet, and if the information differs, use this to discuss the differences in reference materials.

## Assessment

- **Questions**
  - What is a terrestrial planet?
  - Which planet(s) do not have more than one moon?
  - Which planet(s) have rings?
- **Journal/writing prompts**
  - You have built a spaceship that could travel anywhere in our solar system. Tell where you would go first and describe what you would see in your travels from Earth.
  - Choose one planet and imagine you were sent there. Use all of your senses to describe your surroundings.
- **Other**
  - Create a presentation slideshow with pictures and data for each planet.
  - Have students create an “I have, who has” game for the solar system on their own.

### **Extensions and Connections (for all students)**

- Have students diagram and color a sketch of the solar system.
- Have students research different moons of the planets such as Europa and Titan.
- Allow students to choose one planet to research further. On the back of this sheet write an informative report on your chosen planet using the research you have found.

### **Strategies for Differentiation**

- The table could have one planet per page to show the information of designated planet. Allow enough space for a diagram to show all characteristics of the planet.
- Provide a word bank containing necessary vocabulary.

# Planet Data Table

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Planet	Distance From Sun in Miles	Terrestrial or Gaseous	Diameter in Miles	Number of Moons	Ring System?
Mercury					
Description and other facts					
Venus					
Description and other facts					
Earth					
Description and other facts					
Mars					
Description and other facts					
Jupiter					
Description and other facts					
Saturn					
Description and other facts					
Uranus					
Description and other facts					
Neptune					
Description and other facts					

## Planet Data Table (Key)

<b>Planet</b>	<b>Distance From Sun in Miles</b>	<b>Terrestrial or Gaseous</b>	<b>Diameter in Miles</b>	<b>Number of Moons</b>	<b>Ring System?</b>
Mercury	36,000,000	Terrestrial	3032	0	no
Description and other facts	Mercury is a small heavily cratered planet. It is the closest planet to the sun and looks similar to our moon.				
Venus	67,200,000	Terrestrial	7521	0	no
Description and other facts	Venus is similar to Earth in size and mass. It has a permanent blanket of clouds trapping heat. Its surface temperatures are hot enough to melt lead.				
Earth	93,000,000	Terrestrial	7926	1	no
Description and other facts	Earth's atmosphere, liquid water, its distance from the sun and many other factors make Earth a haven for life.				
Mars	141,600,000	Terrestrial	4221	2	no
Description and other facts	The atmosphere on Mars is thin and there is a vast network of canyons and riverbeds on the red planet. Scientists hypothesize that Mars once supported a wet, warm Earth-like climate.				
Jupiter	483,800,000	Gaseous	88,846	64	yes
Description and other facts	Jupiter is the largest planet in our solar system and is considered a gas giant. It has no solid surface.				
Saturn	890,800,000	Gaseous	74,897	62	yes
Description and other facts	Although all other gas giants have rings, Saturn is well-known for its beautiful rings.				
Uranus	1,703,400,000	Gaseous	31,763	27	yes
Description and other facts	Uranus is a gas giant. Its equator is at nearly a ninety degree angle to its orbit. Methane gives Uranus a blue tint.				
Neptune	2,761,600,000	Gaseous	30,775	13	yes
Description and other facts	Neptune appears blue through telescopes and is a gas giant. It is dark, and is whipped by supersonic winds.				

Students may find different facts about each planet. Descriptors given above are possible answers.