Educator Information and Directions

This packet is a complement to our video lesson ***The Solar System Through the Ages.*** The following pages include these items:

- Review Vocabulary
- Guided Notes
- Solar System Models extension activity
- The Myth of the Flat Earth extension activity

We recommend printing this packet prior to your student watching the video so that they can follow along with the guided notes, which they can then use when answering practice questions.

The ungraded extension activities will require family involvement and additional support from a parent or older sibling. It will promote the following:

- Critical thinking
- Application skills
- Observational skills
- Inference skills

Suggested Gold/$coops
Using the reward function on the first tab of your parent account, you may wish to award Gold/$coops for extension activities and/or accomplishments completed outside the website.
Recommended Gold/$coops for the activity: 150

Extension Activities

Reading List
Reading is a wonderful way to extend your student's learning and improve their vocabulary. Here are some of our astronomy favorites:

1. *Clues to the Universe*, by Christina Lee
2. *We Dream of Space*, by Erin Entrada Kelly
3. *Space Case*, by Stuart Gibbs
4. *To Fly Among the Stars*, by Rebecca Siegel

100 Gold/$coops per book

Research Skills
Learn more about astronomers and astronomy. What does the work of an astronomer really entail? What do they do each day? How do they see into space? Do they work with astronauts? Are modern astronomers still making discoveries that change how we think about the solar system, just like Copernicus and Galileo?
50 Gold/$coops

Scientists in Your Community
Read science news to explore and discover stories of new space discoveries. Then, talk about the discoveries with your family.
50 Gold/$coops

The Solar System Through the Ages Vocabulary Review

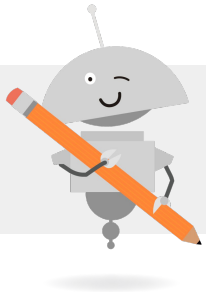
Please review these key terms to develop a better understanding of this lesson.

1. **Heliocentric model** - a model of the solar system with the Sun at the center

2. **Geocentric model** - a model of the solar system with the Earth at the center

3. **Solar system** - the Sun and the celestial bodies that are in its orbit and revolve around it

The Solar System Through the Ages
Guided Notes



Instructions
Download and print this PDF to complete while watching the *The Solar System Through the Ages* teaching video. Fill in each of the blanks with the appropriate word or phrase. *It's okay to pause the video when it's time to write.*

Overview
In this lesson, you are going to learn about how our understanding of the solar system has changed over time.

Our Solar System

1. The solar system is the _____ and other _____ _____, or things in space, that are in its _____ and revolve around it.
2. Eight planets, including the _____, smaller dwarf planets, and millions of pieces of rock and ice orbit our sun.
3. _____ can also be found within the solar system. They are held in orbit around planets by _____.
4. So, how did we come to know all of this? Well, to find out, we have to go back to the year 384 B.C.E. That's over _____ years ago!

Aristotle

5. This is when Aristotle was born. He was a Greek philosopher who thought the _____ was the _____ of all things.
6. His model of space placed the _____, _____, other _____, and _____ all orbiting Earth.
7. He thought that if Earth went around the Sun, then the relative positions of the _____ would change as Earth moved.

8. Aristotle thought that Earth did not _____. This may seem silly now, but there were no _____ when Aristotle lived.
9. He and other scientists looked for parallax, or a _____ in the position of a celestial body, when they stood at different points on Earth.
10. They couldn't see any change because the _____ are so far away from Earth that you can only see _____ with a telescope.

Aristarchus

11. Aristarchus was born _____ years later. He was not a Greek philosopher. He was, however, a Greek _____ and mathematician.
12. He first proposed a heliocentric model of the solar system, or a model with the _____ in the center.
13. But, believe it or not, hardly anyone _____ him.

Ptolemy

14. Now, let's jump to the year 100 CE. On Egypt's Mediterranean coast, Ptolemy, a mathematician and geographer, studied _____ and wrote a famous book called *Almagest*.
15. This book was based on 800 years of observations of the _____.
16. He used these observations to develop a geocentric model, or a model with _____ at the center, that was used by other astronomers for _____ _____!
17. Ptolemy believed that planets moved in small _____, and that they all moved in bigger circles around _____.
18. Since astronomers followed Ptolemy's model for such a long time, we can jump ahead to the year _____ CE.

Copernicus

19. This is when Nicolaus Copernicus developed his own model of a _____ planetary system. Like Aristarchus, he believed that the _____ was the center of our solar system.
20. However, because astronomers still had no special equipment to _____ outer space, Copernicus kept Ptolemy's idea that planets moved in perfect circles.
21. However, he got rid of the idea that the planets themselves moved in tiny circles, which was called the _____-_____-_____ system.
22. Even though he didn't have it all _____, the heliocentric model made by Copernicus is generally seen as the first _____ model of the solar system to be developed.

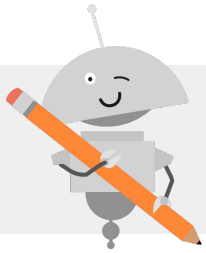
Kepler

23. What important discovery did Johannes Kepler, a German mathematician and astronomer, make in 1605 C.E.?

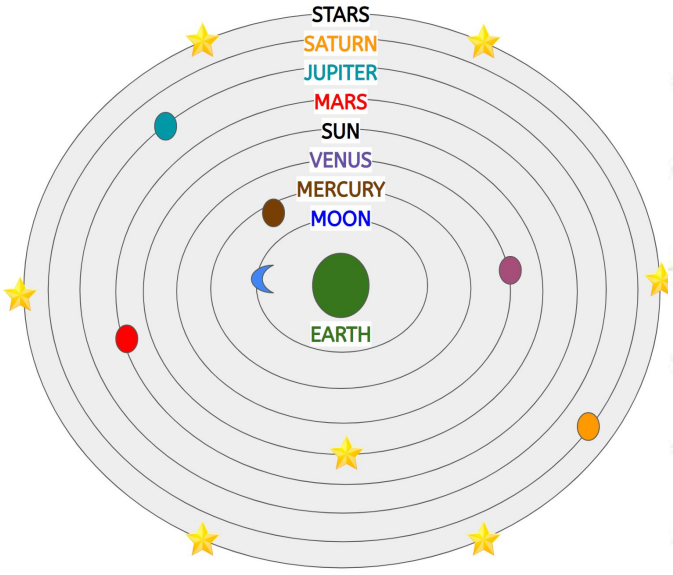
Galileo

24. Now that we know the planets orbit around the _____ and move in _____, let's talk about Galileo. He was an Italian astronomer, physicist, and engineer who lived around the same time as Kepler.
25. Using the newly invented _____, he was the first to observe many aspects of our solar system.
26. He also studied _____ and other important ideas to astronomy!
27. These discoveries all helped us understand our _____ system.

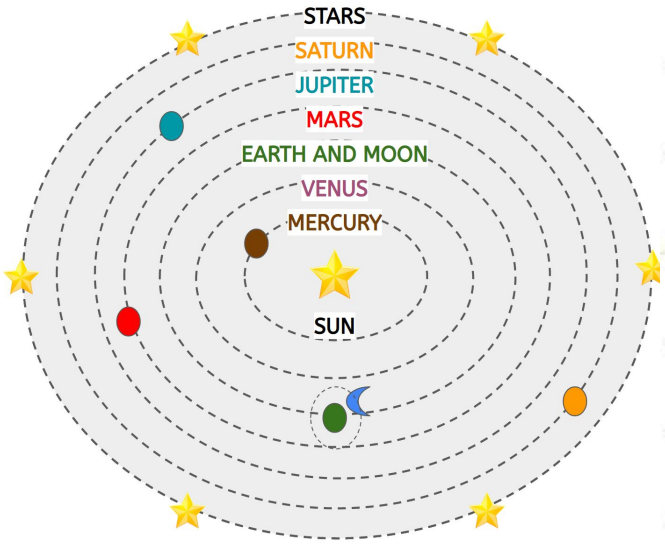
Solar System Models Extension Activity



Look at each model of the solar system. Then, use our modern understanding to explain what each model got right and/or wrong about the solar system.

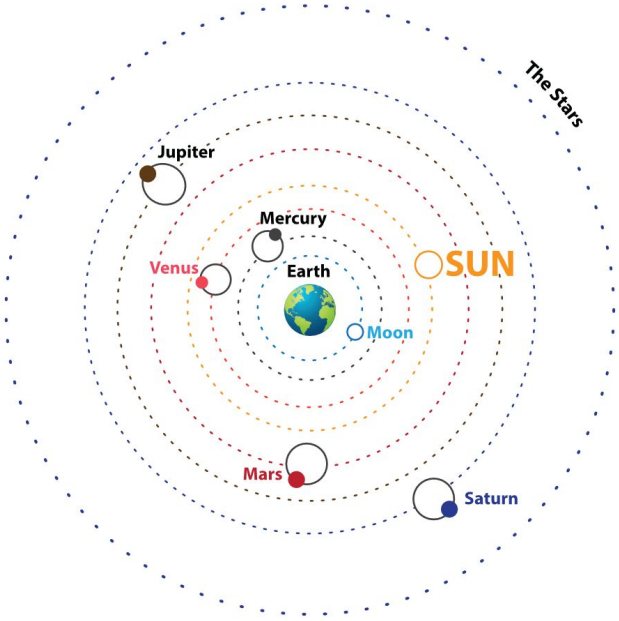


Aristotle's Model

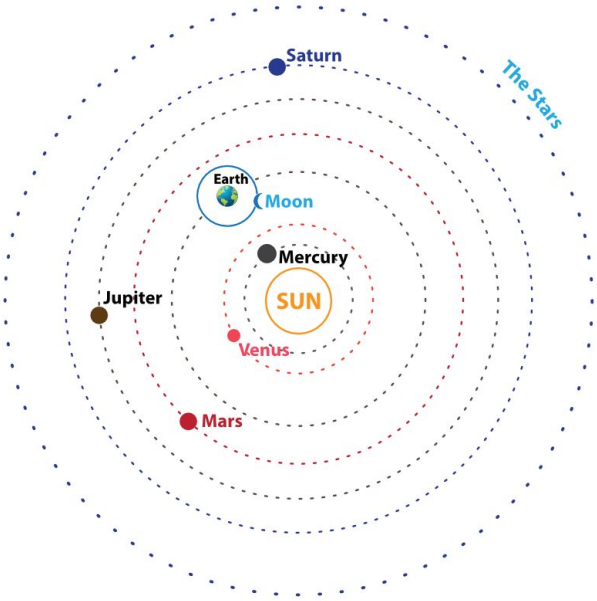


Aristarchus's Model

The Solar System Through the Ages
Extension Activity

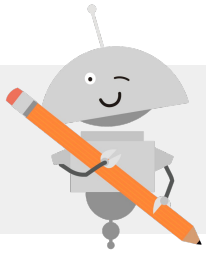


Ptolemy's Model



Copernicus's Model

The Myth of the Flat Earth Comprehension Activity



In 1492, Columbus set sail to prove the Earth was round. Before his voyage, scientists believed that the Earth was completely flat. In fact, he had a hard time getting support for his voyage because so many people thought he was going to simply sail off the edge of the Earth!

...Right?

Did you notice that none of the models of the solar system we discussed in this lesson included the Earth being flat? That's because Greek astronomers figured out that the Earth was spherical even before Aristotle was born. In fact, a mathematician calculated nearly the exact circumference of the Earth around the time Aristarchus lived. We've known that the Earth was spherical for longer than we've known it moved in space or orbited the Sun!

So, where does the myth of the flat Earth misconception come from? It might sound silly, but it was essentially a rumor one group started to make another group sound silly around the 1800s. The idea that Columbus thought he was risking sailing over the edge of the Earth might sound like an exciting story, but ultimately, it's just that: a story.

Which models of the solar system do you think incorporated a flat Earth instead of a spherical one? Why?

_____

_____

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