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Warm-Up | The Solar System

Lesson Question

Lesson Goals

Learn about the solar system.

Compare the _____ and heliocentric models of the solar system.

Explain how Copernicus, Galileo, and Kepler contributed to the acceptance of the heliocentric model.

Identify _____ that make up the solar system.

Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

	a model of the solar system where planets orbit the Sun
	a small chunk of rock and metal debris in space
	belonging to or related to the sky
	a mini-orbit that explains the variations in movement of planets in the solar system
	a small object made of ice and dust that orbits the Sun
	a rocky object that orbits the Sun
	a model of the solar system where the Sun and planets orbit around Earth

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Early Greeks and the Heavens

The ancient Greeks were sophisticated _____.

- Early Greeks thought planets were being moved across the sky by gods.
- They noticed stars did not _____.
- They named many _____ after characters in Greek myths.

Greek Astronomers

The Greeks studied the stars and solar system.

- Created star _____
- Built instruments to help understand and predict the movement of _____ bodies
- Observed and understood equinoxes, solstices, and _____ of the moon

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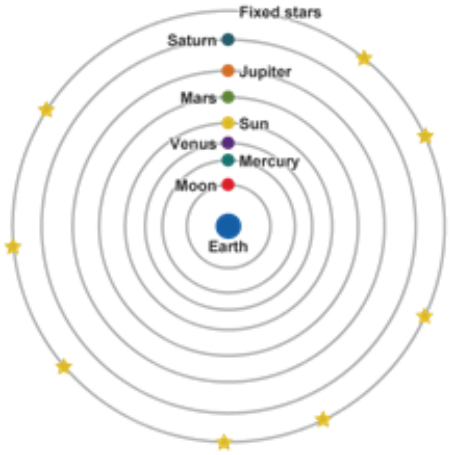
Aristotle's Geocentric Model

Aristotle established the **geocentric model** in [ ] BCE.

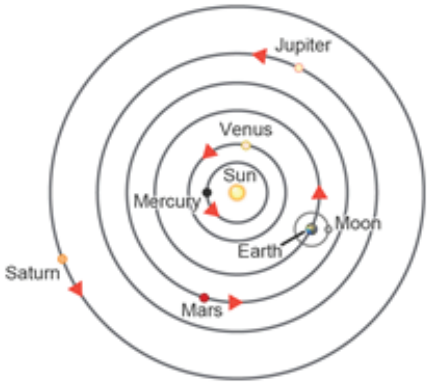
- Aristotle proposed that all [ ] bodies revolved around Earth.
- This model persisted for more than a [ ] due to Aristotle's fame.



Aristarchus's Early Heliocentric Model

Aristarchus stated that the Sun is the [ ] of the universe.

- This is known as the **heliocentric model**.
- Aristarchus also believed that Earth rotates on its [ ] once a day.
- He argued this model gave the appearance that bodies moved in the [ ].



Aristarchus's Heliocentric Model
(Not to Scale)

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The Ptolemaic Model

Greek astronomer Ptolemy created a complex geocentric model.

- Each planet spun in an _____ (mini-orbit) while orbiting Earth.
- This model explained why planets appear to move backward.
- This model persisted for centuries due to _____, religion, and philosophy.



Retrograde Motion

- Retrograde motion is caused by Earth moving _____ than other planets.

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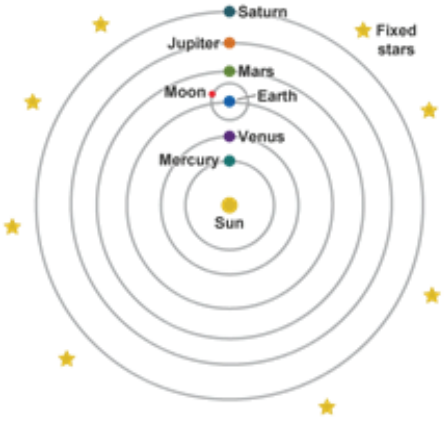
Copernicus's Heliocentric Model

Copernicus rediscovered Aristarchus's heliocentric model.

- His model had planets orbiting the _____ and the _____ orbiting Earth.
- This model explains the Sun's rising and setting is due to Earth's _____.
- His model was rejected because it went against _____ teachings.



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Galileo's Support of Copernicus's Model

Galileo Galilei later made observations that supported Copernicus's model.

- Found moons of Jupiter, conflicting with teachings of _____ and _____
- Discovered that _____ has phases, proving it orbits the Sun
- Published his evidence in _____, reaching a wider audience

Slide 7

Kepler's Modifications to Copernicus's Model

Johannes Kepler accurately described the _____ of the planets.

- Used _____ collected by Tycho Brahe
- Constructed the _____ of planetary motion
- Demonstrated that _____ were elliptical
- Determined that planets move faster when closer to the _____

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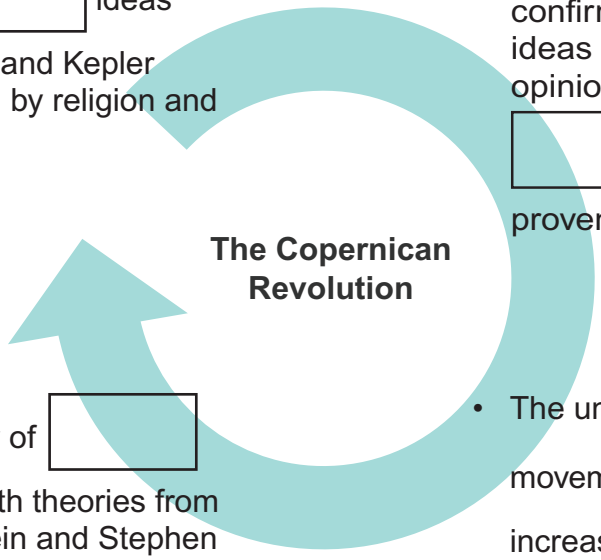
Slide 7

The Copernican Revolution

- [ ] ideas from Galileo and Kepler were hushed by religion and politics.
- Scientists checked, confirmed, and refined ideas until nonscientific opinions could be [ ] proven.
- The curiosity of [ ] increased with theories from Albert Einstein and Stephen Hawking.
- The understanding of the movement of [ ] increased with Isaac Newton's theories of gravity.



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Planets in the Solar System

The planets are part of the solar system.

- [ ] people knew about Mercury, Venus, Earth, Mars, Jupiter, and Saturn.
- [ ] and [ ] were discovered later, as was the dwarf planet Pluto.

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Terrestrial Planets and Gas Giants

The planets in the solar system are divided into two categories: terrestrial planets and gas giants.

Terrestrial Planets

- Consist mostly of [ ]
- Have an [ ]
- Include Mercury, Venus, Earth, and Mars

Gas Giants

- Made of [ ], including helium, water vapor, and hydrogen
- Are much [ ] than terrestrial planets
- Include Jupiter, Saturn, Uranus, and Neptune

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Other Objects in the Solar System

Besides the planets, the solar system is also made up of different bodies.

- The [ ]: a star that is the center of our solar system
- [ ]: small objects of ice and dust that orbit the Sun
- [ ]: small, rocky objects that orbit the Sun
- [ ]: small chunks of rock and metal debris in space

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Slide 12

Knowledge of the Solar System

Today, we know the solar system consists of the Sun, the planets, and other bodies.

- We continue to learn about the solar system through:
  - [ ] explorations.
  - space probes such as Juno, which is exploring [ ].

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Lesson Question

What contributions led to the acceptance of the heliocentric model of the solar system?

Answer

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Review: Key Concepts

_____ Model	_____ Model
• Earth is the center of the universe. • Aristotle established this model around 350 BCE. • Ptolemy expanded this model to include epicycles.	• The Sun is the center of the universe. • Aristarchus first proposed this model. • Copernicus, Galileo, and Kepler refined this model till it was later accepted.

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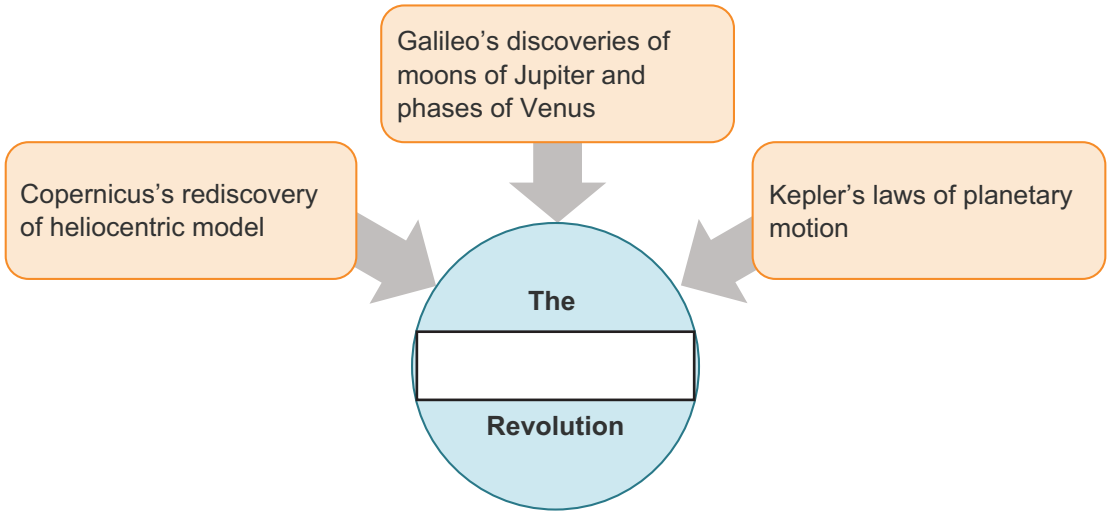
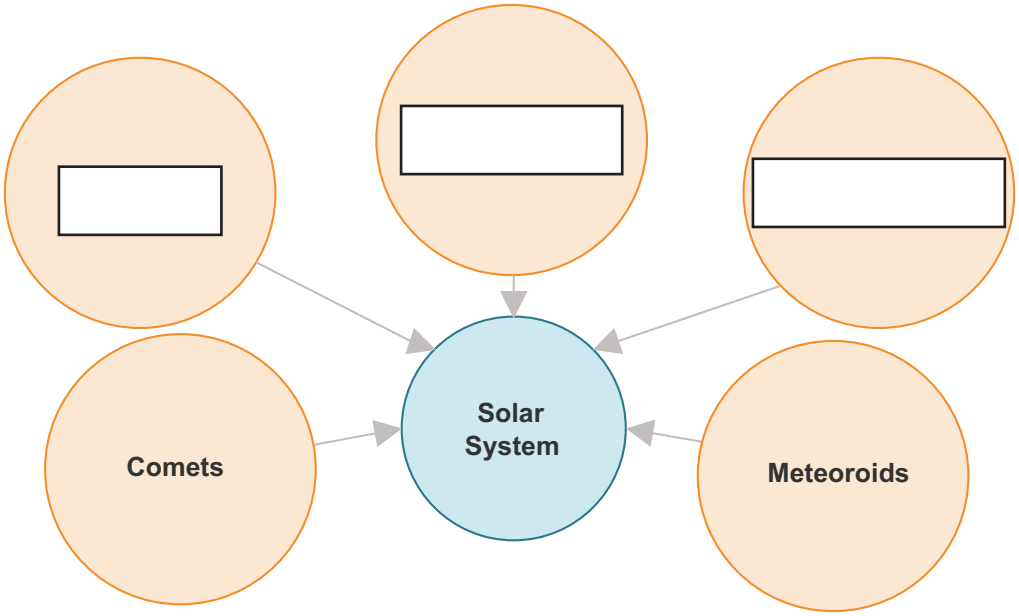
Review: Key Concepts



Review: Key Concepts



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Use this space to write any questions or thoughts about this lesson.

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