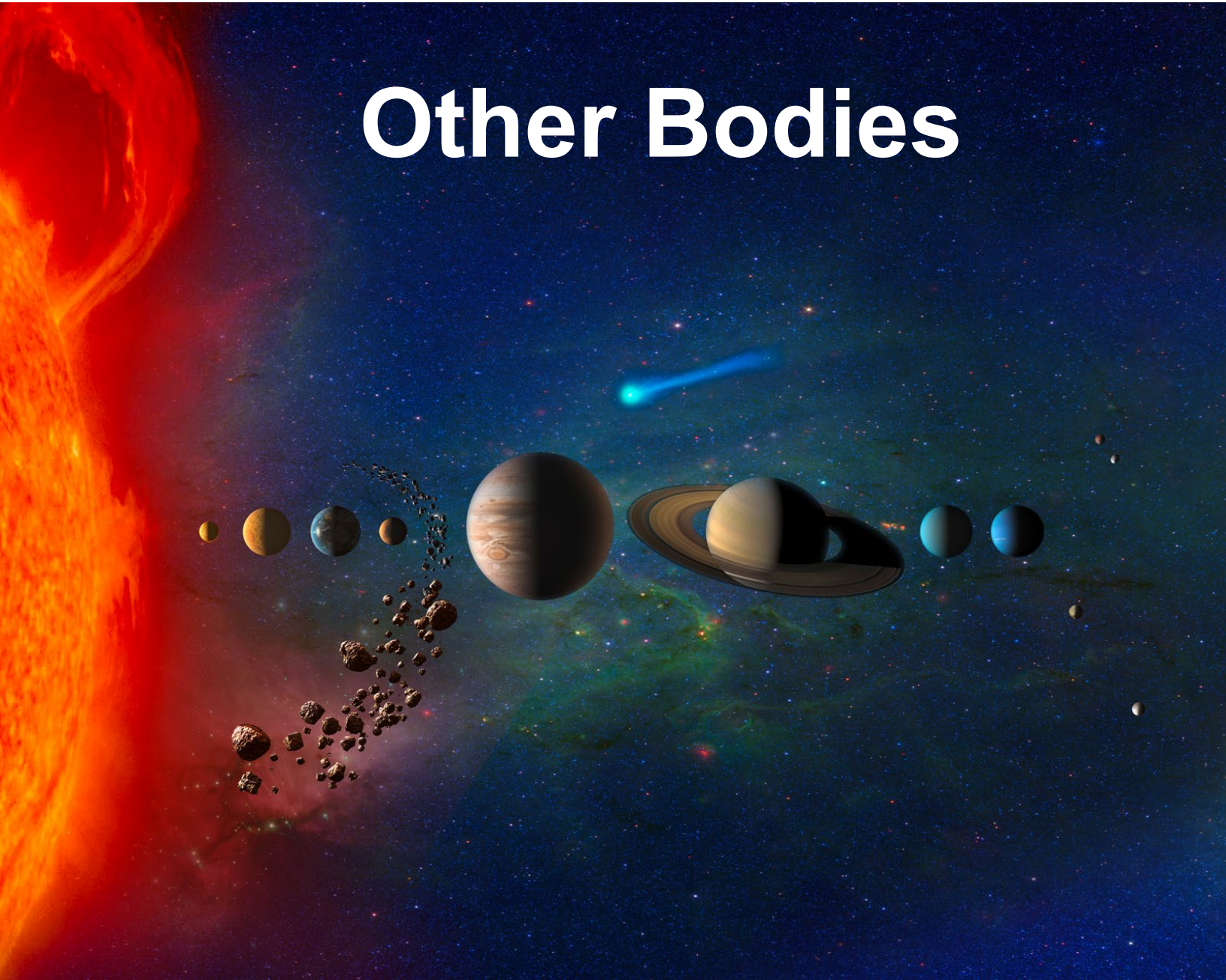


Other Bodies



Source: [NASA](#)





Our Solar System: Other Bodies

Activity 1: Hot Seat

Facilitator Notes

Objective:

Students will try to guess the word written on a card they cannot see by listening to clues to retain vocabulary words and their definitions.

Materials Needed:

- Vocabulary cards
- Tablet timer

Summary of Student Action:

One student will hold a card in front of their forehead, where they can't see it, while others in the group give them hints about the word. The student holding the card will try to guess the word as quickly as possible, so they can move on to the next in the stack. They will try to correctly guess as many words as possible in 60 seconds. Students may choose to "pass" on a card if they can't get it.

Setup Instructions:

- Print and cut out the vocabulary cards corresponding to the desired difficulty level.
- Stack the cards face down on the table.
- Print and display the rules so students can be self-directed.
- Set up a 60-second timer on a tablet and place it with the cards. This activity can be done in pairs or small groups.

Delivery:

- This activity is intended to be delivered in person, but it can be delivered virtually by sending words one at a time in the chat to all participants except the one in the hot seat.

Additional Notes:

- The difficulty level can be adjusted by removing cards from the stack.



Our Solar System: Other Bodies

Activity 1: Hot Seat Student Instructions

Activate Your Knowledge:

What bodies exist in the solar system besides the Sun and planets? What features make them different from planets and different from each other?

Materials You Will Need:

- Vocabulary cards Tablet timer

Procedures:

1. Choose one person in your group to be in the hot seat and give them time to become familiar with the bodies and characteristics by flipping through the stack of vocabulary cards.
2. Set a timer on the tablet for 60 seconds and shuffle the vocabulary cards. Set the stack facedown on the table.
3. The person in the hot seat will pick up the first card and hold it on their forehead where they cannot see any of the text.
4. Start the timer.
5. Participants in the group will state facts about the word on the card as hints for the person in the hot seat.
6. The person in the hot seat will try to guess the word. They can guess as many times as they need to. If the guess is correct, they can put the card to the side. If they can't guess it and decide to pass, they will place the card in a separate pile.
7. When the timer runs out, count the number of correct guesses. Play multiple rounds and determine who guessed the most correctly in 60 seconds.

Other Bodies - Activity 1 - Hot Seat Vocabulary Cards

Moon

- Natural satellite of a planet
- Earth has one
- Earth's has phases

Pluto

- Well-known dwarf planet
- Used to be called a planet
- Found in the Kuiper Belt

Dwarf Planet

- Pluto is an example
- Includes Ceres, Haumea, Makemake, and Eris
- Larger than an asteroid

Asteroid

- Small rocky body
- Often irregular in shape
- Most are found in a "belt"

Meteoroid

- Most are fragments of asteroids or comets
- Can be rocky or metallic
- Less than 1 meter across

Meteor

- A streak of light in the sky
- Sometimes called a "shooting star"
- Caused by a meteoroid

Meteorite

- Can be rocky or metallic
- Found on Earth
- A meteor that makes it through the atmosphere

Comet

- Has a nucleus made of ice and dust
- Comes from the Kuiper Belt and Oort cloud
- Has a “tail” of gas and dust

Asteroid Belt

- Region between the orbits of Mars and Jupiter
- Where Ceres is located
- A collection of many rocks

Kuiper Belt

- A ring of icy bodies
- Region in space beyond the orbit of Neptune
- Where Pluto is located

Sphere

- A round, solid figure
- The shape of planets
- Shaped like a ball

Orbit

- The curved path of a celestial object circling around another object
- Regular, repeated path of a satellite



Our Solar System: Other Bodies

Activity 2: Large Moons and Dwarf Planets

Facilitator Notes

Objective:

Students will investigate the characteristics of large, non-planetary objects in the solar system to identify the characteristics of planets and determine why each object is not classified as a planet.

Materials Needed:

- Activity sheet
- Writing utensil
- Links:
 - [Mercury](#)
 - [The Moon](#)
 - [Ceres](#)
- Infographic: [Dwarf Planets](#)
- Digital tablets (9)
 - [Ganymede](#)
 - [Titan](#)
 - [Pluto](#)
 - [Haumea](#)
 - [Makemake](#)
 - [Eris](#)

Summary of Student Action:

Students will use a table to investigate the characteristics of several objects and use the activity sheet to mark which criteria for a planet each object satisfies. They will draw conclusions about the classification of each object.

Setup Instructions:

- Print the activity sheet for students to use.
- Display the dwarf planet infographic.
- Set up one table for each of the bodies and open the corresponding page.

Delivery:

- This activity can be delivered virtually by sending the activity sheet to participants.



Our Solar System: Other Bodies

Activity 2: Large Moons and Dwarf Planets

Student Instructions

Activate Your Knowledge:

How many planets are there in our solar system? Is Pluto a planet? Are there other large bodies in our solar system that are like planets but called something else?

Materials You Will Need:

- Activity sheet
- Writing utensil
- Infographic: [Dwarf Planets](#)
- Digital tablets

Procedures:

1. Take one activity sheet. Read the column headings and names of the bodies.
2. Read the infographic to learn more about the dwarf planets.
3. Explore the webpage for each of the objects and complete the activity sheet.
4. After completing the entire sheet, decide if each object is a planet by comparing the data to the list of planet requirements.

What is a planet?

A planet must meet three requirements:

1. It must orbit a star directly. In our solar system, that star is the Sun.
2. It must have enough mass for its gravity to force it into a nearly round, or spherical, shape.
3. It must have cleared the area around its orbit of other objects.

	Orbits the Sun Directly	Is Nearly Round	Has a Clear Orbit
Mercury	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Earth's Moon	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ceres	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ganymede	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Titan	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pluto	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Haumea	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Makemake	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Eris	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Large Moons and Dwarf Planets Answer Key

What is a planet?

A planet must meet three requirements:

1. It must orbit a star directly. In our solar system, that star is the Sun.
2. It must have enough mass for its gravity to force it into a nearly round, or spherical, shape.
3. It must have cleared the area around its orbit of other objects.

	Orbits the Sun Directly	Is Nearly Round	Has a Clear Orbit
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Earth's Moon	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Ceres	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Ganymede	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Titan	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Pluto	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Haumea	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Makemake	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Eris	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No



Our Solar System: Other Bodies

Activity 4: Comets and Orbits

Facilitator Notes

Objective:

Students will watch videos, play a game, and read text to learn about comets and orbital periods.

Materials Needed:

- Video: "[Real World: Comet Quest](#)"
- Game: "[Celestial Jukebox](#)"
- Video: "[Real World: Comets – It's Done With Math](#)"

Summary of Student Action:

Students will learn about the structure and motion of comets, especially how scientist can learn about the early solar system by studying them. They will play a game to demonstrate orbital periods by measuring the time between transits.

Setup Instructions:

- Open all links in advance to ensure they work as expected.

Delivery

- This activity is intended to be delivered virtually.
- You may choose to share your screen to watch the videos.
- The link to "Celestial Jukebox" should be sent to students after watching the videos. This game should be saved for last because it gets into more complex concepts after the first couple rounds.
- This activity can be delivered in person by setting up a tablet for each resource.

Additional Notes:

- Ask questions before each activity to engage the students' prior knowledge and set the stage for the content they will see in each.