

Ceres and Pluto: Dwarf Planets as a New Way of Thinking about an Old Solar System

STUDENT ACTIVITY

1. Describe what a planet is in your own words in the space below.

2. In the space below, write down an explanation of the planet, dwarf planet, and asteroid provided by your teacher.

Dwarf planet is a celestial body that:

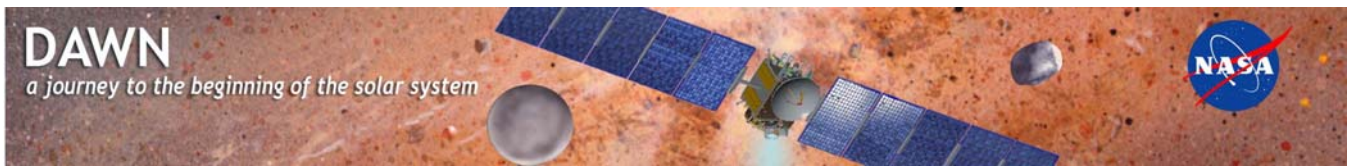
- a. _____
- b. _____
- c. _____
- d. _____

Planet is a celestial body that

- a. _____
- b. _____
- c. _____
- d. _____

Asteroid (or minor planet)

- a. _____
- b. _____
- c. _____
- d. _____



The following is an image of Ceres (Image 1) an example of a dwarf planet and the location of Ceres within the solar system (Image 2). Note in the image at left that the inner planets and Jupiter have cleared most of the neighboring bodies from their orbits while Ceres and Vesta have not. Note also that Ceres is nearly round, while Vesta (Image 3) is more irregular in shape.



Image 1: Ceres (dwarf planet)
Hubble Space Telescope

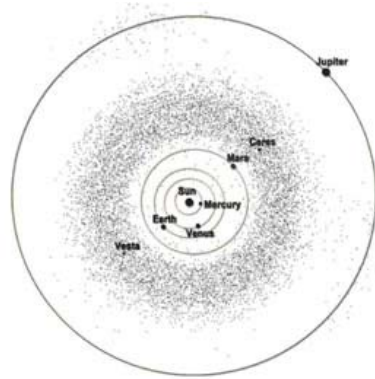


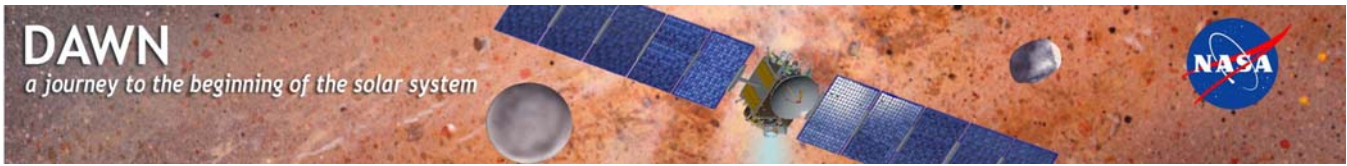
Image 2: The Asteroid Belt
Solar System Dynamics Group, JPL



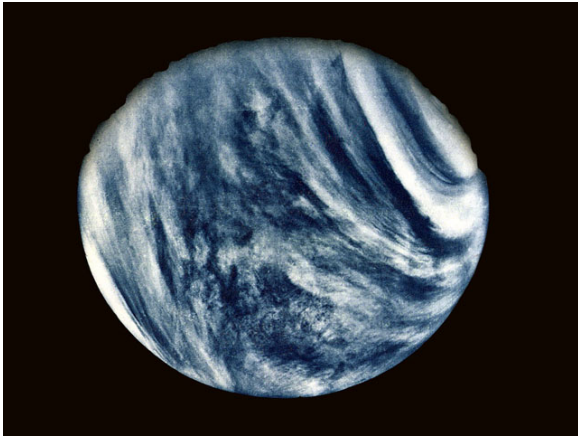
Image 3: Vesta
(asteroid or minor planet)

Hubble Space Telescope

3. Restate the explanation of the term Dwarf Planet in your own words.

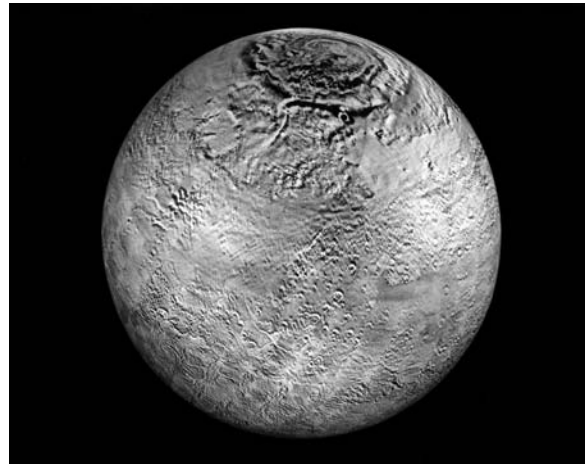


4. Use the following images and information to classify the bodies as a planet, dwarf planet, or asteroid.



NASA Image Exchange

Has Cleared Neighborhood



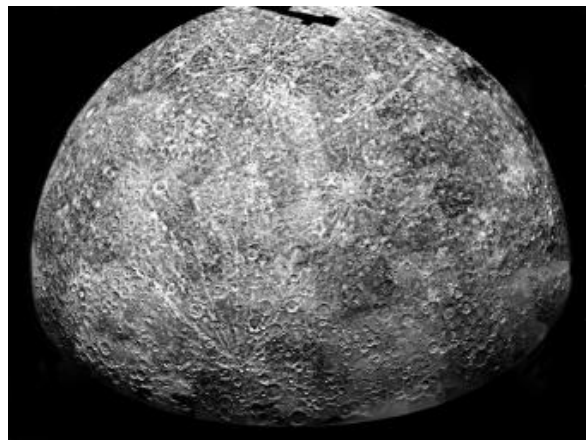
NASA Image Exchange

Has Not Cleared Neighborhood



NASA Image Exchange

Has Not Cleared Neighborhood



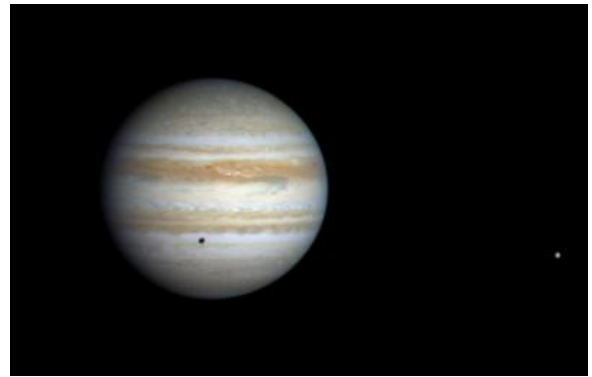
NASA Image Exchange

Has Cleared Neighborhood



NASA Image Exchange

Has Not Cleared Neighborhood



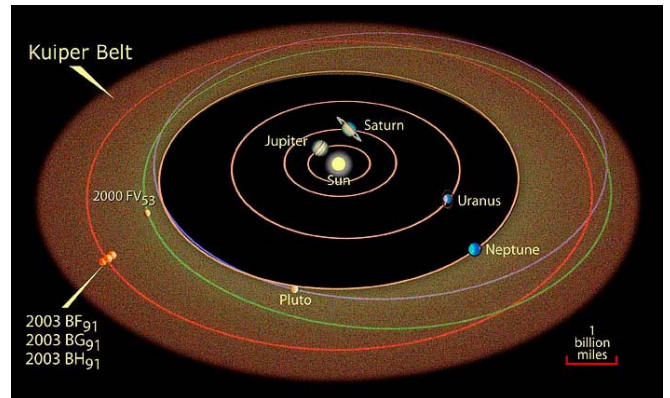
NASA Image Exchange

Has Cleared Neighborhood



NASA Image Exchange

Has Not Cleared Neighborhood

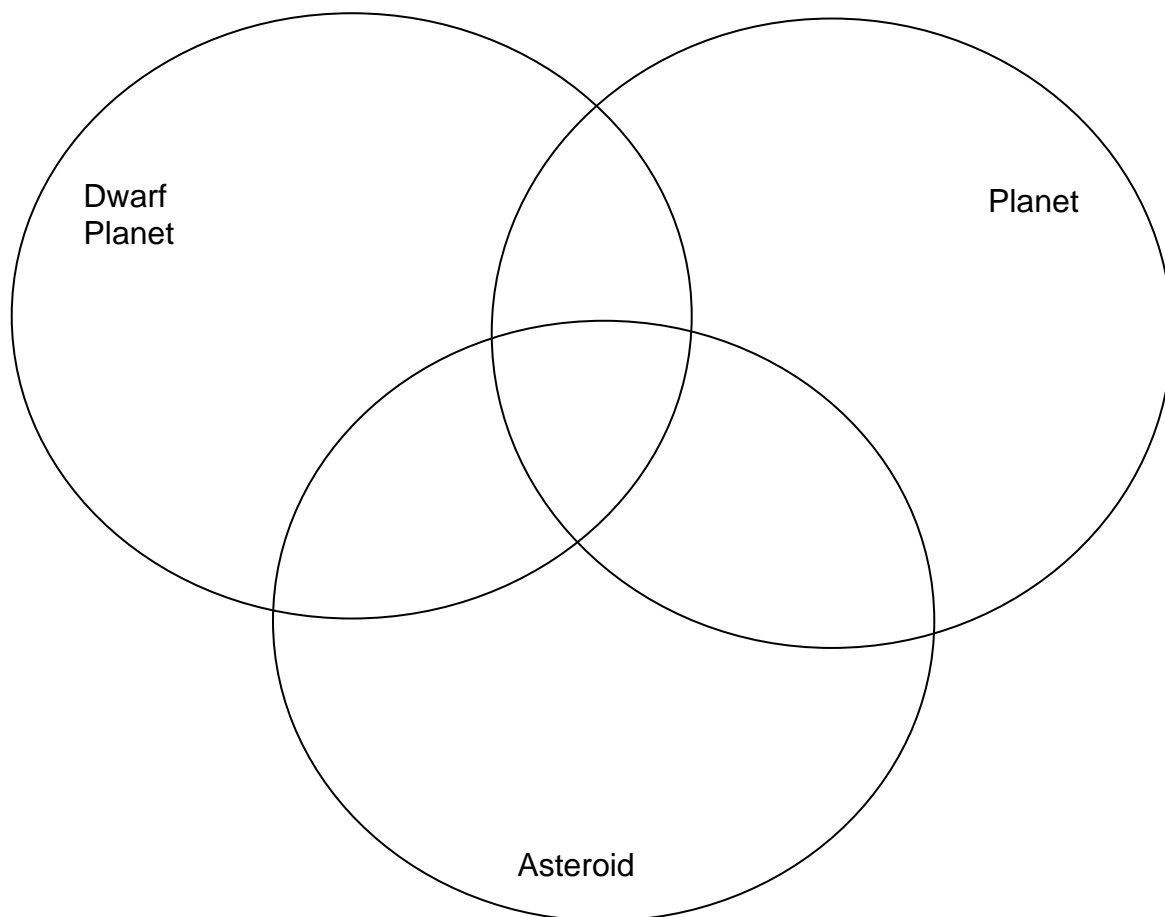


http://whyfiles.org/011comets/images/kuiper_belt.jpg

Kuiper Belt Object

Kuiper Belt is a ring of small icy bodies that orbit the Sun beyond the orbit of Neptune.

5. Use the Venn Diagram to compare the terms planet, dwarf planet, and asteroid.



We will compare terms by comparing examples of these terms Earth, Ceres, Vesta, and Pluto. Have students learn about these bodies by referring to the following resources.

<http://www.nineplanets.org/>

<http://ssd.jpl.nasa.gov/>

Lodders, K. & Fegley, B. 2005. The planetary scientists companion. USA: Oxford University Press.

McFadden, L., Johnson, T. V., & Weissman, P. R. 2007. Encyclopedia of the solar system. USA: Academic Press.

6. Complete the following comparison matrix:

| Comparison Matrix Earth (Planet) and Ceres (Dwarf Planet) | | | | |
|--|--------------|--------------|--------------|--------------|
| Characteristic | Earth | Ceres | Vesta | Pluto |
| Location in the Solar System relative to other bodies | | | | |
| Size and Shape | | | | |
| Mass and Gravity | | | | |
| Density | | | | |
| Presence of Water | | | | |
| Internal Structure | | | | |
| Surface Features | | | | |
| Number of moons | | | | |
| Magnetic Field | | | | |
| Length of Day | | | | |
| Length of Year | | | | |
| Atmosphere | | | | |