



Dwarf Planets

Is Pluto a Planet?

Classroom Activity

Overview

Age Range:

10-13

Prep. Time:

5 minutes

Lesson Time:

1 hour 35 minutes

Cost per activity:

Low

Includes the use of:

Internet (optional)

Outline

The students will first be introduced to the story of Pluto and its history. Then they will be asked how they would define objects in our solar system.

Next they will take part in an activity where they will try and define a planet and decide which statements might apply to other space objects.

Finally, students will be introduced to the five dwarf planets in our solar system and the Kuiper belt. Before using their research skills to complete a matrix on the dwarf planets.

Pupils will Learn:

- The definition of objects in our solar system
- The difference between a planet and a dwarf planet

Lesson Plan:

Overview of the time required to complete lesson.

Description	Time	Notes
Introduction to the subject	10 min	https://www.britannica.com/list/10-important-dates-in-pluto-history
Activity 1	30 min	Use pdf: PlutoandDwarfPlanets_activity1_statements

Online Observatory: onlineobservatory.eu

The online observatory collaboration consists of the following partners:

Baldone Observatory, Brorfelde Observatory, Cardiff University, Harestua Solar Observatory, Helsinki Observatory



Break	15 min	
Introduction to main activity	10 min	<p>Article suggestions:</p> <p>https://www.wired.com/2010/08/0824pluto-deplanetized/</p> <p>https://news.nationalgeographic.com/news/2006/08/dwarf-planet-pluto-astronomy/</p> <p>Watch video:</p> <p>https://www.youtube.com/watch?list=PL9TFrgFq7555w3vnggH2h32dUuGysJFvb&time_continue=2&v=flp4Ay1_-ml</p>
Activity 2	30 min	<p>Dwarf Planet facts:</p> <p>https://solarsystem.nasa.gov/planets/dwarf-planets/pluto/by-the-numbers/</p> <p>https://theplanets.org/dwarf-planets/</p> <p>https://www.bobthealien.co.uk/solarsystem/table.htm</p>

Introduction to the subject:

Look over the history of Pluto <https://www.britannica.com/list/10-important-dates-in-pluto-history> or <https://www.sciencenews.org/article/pluto-timeline-85-years-discovery>.

Pluto was reclassified as a dwarf planet in 2006, after a vote by the IAU (International Astronomical Union). To understand why, we first need to be able to define what a planet is, along with understanding other space objects, such as asteroids, dwarf planets and comets.

Ask the students for their definitions of a planet, an asteroid, a satellite (moon) and a dwarf planet.

Activity 1:

- Divide the students into pairs and give each a set of statement cards

The students will need to either cut out the statements or use a coloured pen/pencil to mark them.

1. Students should take the time to read through the list of statements
2. They should then decide whether they think the statement defines a planet or not
3. If they think a statement does not define a planet, ask them to make a note of what astronomical body they think it does describe
4. Display each of the statements in turn and have the class vote, before revealing the answer

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Introduction to Activity 2:

Discuss why, based on the planet definition, Pluto is classed as a Dwarf planet. You can choose to read some articles about the reclassification of Pluto.

<https://www.wired.com/2010/08/0824pluto-deplanetized/>

<https://news.nationalgeographic.com/news/2006/08/dwarf-planet-pluto-astronomy/>

Watch the video which explains what a dwarf planet is:

https://www.youtube.com/watch?list=PL9TFrgFq7555w3vnggH2h32dUuGysJFvb&time_continue=2&v=flp4Ay1_-ml

Activity 2:

- This activity can be completed individually or in small groups.

The students will need a matrix table and either access to the internet or copies of the dwarf planet fact sheets.

1. Students should research the five dwarf planets named on their worksheet
2. Using the information gathered they should fill out the matrix for the Dwarf Planets
3. Compare the dwarf planet information with that of the main 8 planets
4. Take a vote on whether students believe Pluto should be named a planet or a dwarf planet, based on their findings from this activity

Further Work:

Split students into teams, one for Pluto being reinstated as a planet and one against the idea. Give them some time to research and come up with arguments and then have a class debate.

Background Material/Knowledge:

Glossary -

Asteroid - A small solar system object composed mostly of rock. Many of these objects orbit the Sun between Mars and Jupiter. Their sizes range anywhere from 33 feet (10 meters) in diameter to less than 620 miles (1,000 kilometres).

Asteroid Belt - A region of space between Mars and Jupiter where the great majority of asteroids is found.



Comet - A ball of rock and ice, often referred to as a “dirty snowball.” Typically a few kilometres in diameter, comets orbit the Sun in paths that either allow them to pass by the Sun only once or that repeatedly bring them through the solar system.

Dwarf Planet - A celestial body within the solar system that shares the characteristics of planets. It orbits the Sun, is not a moon, and has a spherical or nearly spherical shape. Unlike a planet, however, a dwarf planet has not cleared away any loose cosmic rubble from its orbit.

Exoplanet – A planet outside of our solar system, orbiting a star other than the Sun.

Kuiper Belt - A region in our outer solar system of icy objects, where many comets originate. This region begins near Neptune's orbit at 30 astronomical units (AU) and extends to about 50 AU away from the Sun. The Kuiper Belt may have as many as 100 million comets.

Moon - A large body orbiting a planet, dwarf planet and even some asteroids, see also ‘natural satellite’.

Natural Satellite – A natural object orbiting a larger celestial body (e.g. A planet) see also ‘moon’.

Planet – A celestial body which is not a satellite and is in orbit around the Sun, has sufficient mass to assume hydrostatic equilibrium (a nearly round shape), and has "cleared the neighbourhood" around its orbit.

Satellite – A natural or man-made object that orbits Earth, the Moon, or another celestial object.

Star - A huge ball of gas held together by gravity. The central core of a star is extremely hot and produces energy. Some of this energy is released as visible light, which makes the star glow. Stars come in different sizes, colours, and temperatures.

Sun - The star at the centre of our solar system.