

Astronomical Proportions

You need: a calculator

ACTIVITY ONE

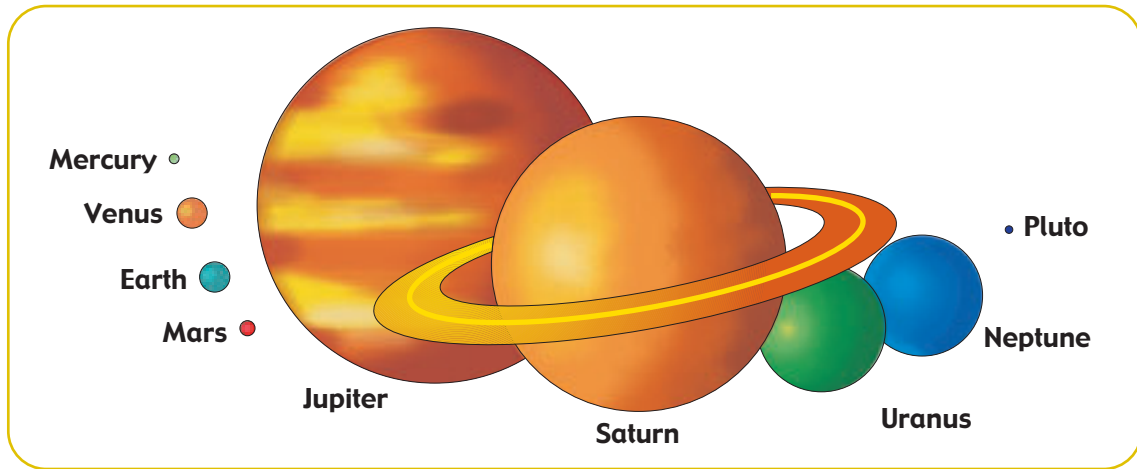
The table below gives the time taken for each planet to complete a full circuit (or orbit) around the Sun. Mercury is closest to the Sun, and Pluto is furthest away from the Sun.

The time is given in Earth years.

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Orbit period (years)	0.24	0.62	1.0	1.88	11.86	29.46	84.01	164.79	?

- Orbital periods increase as the planets get further away from the Sun.
Is the orbital period of Pluto likely to be closer to 300 or 3 000 Earth years?
Explain your answer.
- An Earth year is about 365 Earth days.
Which planets take about the following Earth days to orbit the Sun?
Estimate your answers and then check your estimates on a calculator.
 - 230 Earth days
 - 4 330 Earth days
 - 90 Earth days
 - 60 000 Earth days
 - 700 Earth days
- During the time that Saturn orbits the Sun once, how many times does Mercury orbit it?
Estimate your answer before using a calculator to work it out.

This diagram shows the relative sizes of the planets in the table in **Activity One**. (Note that this diagram is not accurate in terms of distance. The distance between planets is vast.)



1. Complete this table by using the diagram to estimate the radius of each planet. Estimated radii (to the nearest thousand) for Earth and Uranus are given.

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Radius (km)			6 000				25 000		

2. Some scientists believe Pluto is really a moon that has escaped from one of the other planets. Here are the radii of the larger moons in the solar system. (Each moon's planet is shown in brackets.)

Moon (Earth)	1 737 km
Io (Jupiter)	1 821 km
Ganymede (Jupiter)	2 631 km
Titan (Saturn)	2 575 km
Triton (Neptune)	1 353 km
Callisto (Jupiter)	2 410 km
Europa (Jupiter)	1 561 km
Oberon (Uranus)	761 km

- a. Is Pluto the right size to be an escaped moon?
 b. Compare the size of each moon with its planet. What is extraordinary about the size of Earth's moon?
3. At last count, the number of moons for each planet was:

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Moons	0	0	1	2	29	30	21	8	1

Is it true that larger planets have more moons?
 Explain your answer.