TEACHER RESOURCE

# STARDOME OBSERVATORY & PLANETARIUM

FACTS, RESOURCES AND ACTIVITIES ON...

# INTRODUCTION TO DAWN AND CERES

## THE MISSION

The March arrival of NASA's 'Dawn' spacecraft at the dwarf planet Ceres marks the end of a 7-year journey that has taken it over 400 million kilometres away from the Sun. Dawn will then slowly spiral closer, reaching 22,000km from the surface in April.

The Dawn mission is aptly named 'A journey to the beginning of the Solar System'. Getting up close to these primordial objects gives clues to the origins of the Solar System, and of Earth.

After launch in 2007, a gravity-assist from Mars in 2009 sent it out to asteroid Vesta. After orbiting and studying Vesta for a year, Dawn set out on a two-and-a-half-year journey to the largest object in the Asteroid Belt, Ceres.

COMPARISON OF EARTH, MOON AND CERES. IMAGE CREDIT: WIKIPEDIA/COMMONS

## ASTEROID BELT AND DWARF PLANETS

There are over 1.5 million asteroids 1km or greater in size, and more than 200 asteroids are known to be larger than 100km. But if you gathered all of them together, there still wouldn't be enough material to make the Moon.

Although both Ceres and Vesta reside between Mars and Jupiter, Vesta orbits closer to the Sun than Ceres. Vesta is rocky and dry but Ceres is icy.

Ceres is the largest asteroid. Along with Pluto, it was designated a dwarf planet in 2006. However, it is still called an asteroid as well.

A dwarf planet has to be round, it can't be shaped like a potato or a bone, and Ceres is the only round asteroid.

Ceres lies between the orbits of Mars and Jupiter in the Asteroid Belt. It is about 950km across and orbits the Sun every 4.6 years 2.5-3 times further away from the Sun than we are.

Ceres was the Roman god of agriculture, from which we get the word 'cereal'.

## CLEVER LITTLE ROCKET ENGINES

Rather than using big rocket engines to travel around the Solar System, Dawn uses electric engines that have the same force as just two sheets of A4 photocopy paper resting on your hand. It can go from zero to 100km/h in 2 days!

But these engines can keep burning for many weeks at a time without stopping, and so can change the speed of Dawn by more than 10 kilometres per second (36,000km/h)!

## NEXT DWARF PLANET

Dawn's visit to Ceres is the first time a spacecraft has ever gone to a dwarf planet. The New Horizons flyby of Pluto in July will mark the second. However, it's not stopping – it will pass by Pluto and its moons at 50,000km/h!

**SCIENCE CONTENT/ CURRICULUM LINK**

NATURE OF SCIENCE – INVESTIGATING IN SCIENCE EXTEND THEIR EXPERIENCES AND PERSONAL EXPLANATIONS OF THE NATURAL WORLD THROUGH EXPLORATION, PLAY, ASKING QUESTIONS, AND DISCUSSING SIMPLE MODELS

Check out this fact sheet...

http://nssdc.gsfc.nasa.gov/planetary/factsheet/asteroidfact.html

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