SPACE MAPS

LARA ALBANESE

ILLUSTRATED BY TOMMASO VIDUS ROSIN

What on Earth Books

PEGASUS, THE WINGED HORSE
Can horses fly? They can in Greek mythology. Some myths say that Pegasus was born from Medusa's blood, after Perseus cut off her head.

THE GREEK SKY

The Ancient Greeks named the constellations that they saw in the sky after mythological figures. Among the stars they found Perseus, the son of the king, Zeus; Pegasus, the winged horse; the strong Hercules and Medusa, who was able to turn people to stone with just one look. The International Astronomical Union decided to continue using these names, so many are still recognized today. They simply added other constellations that were not visible to the Greeks in order to complete the map, as shown here.

SEA SERPENT
This mythological monster was a big sea snake with many heads. If one of its heads was cut off, two more would grow in its place. Hydra's breath and blood were said to be so poisonous that just smelling them could kill a person.

GALAXIES

The dots and swirls that you see on this map are galaxies. It is thought that there could be as many as 100 billion galaxies in the Universe. When viewed through a strong telescope, we can see the shape of some of them. However, many others are so far away that their form is not clear.

LIGHT YEARS
Distances in space are so big that they can't be measured in the same way as on Earth. Otherwise the numbers would become mind-bogglingly huge. So instead, distances in space are measured in light years. In one year, light can travel approximately 9 trillion km – that's one light year. The square image above represents an area of the sky that is one million light years across, which is a really massive distance.

SPIRAL GALAXY COLOURS
Spiral-shaped galaxies come in many exciting colours. The centre is usually yellow-red, which means that it contains older stars that have cooled down. The arms of the spiral are usually bluish and include young or newborn stars.

BLUE GALAXIES
Blue galaxies often include lots of young and extremely hot stars. When captured on camera their images can appear red. This happens because their light changes as it travels through space.

BARRED SPIRAL GALAXIES
Barred spiral galaxies have two arms branching off the ends of a bar-shaped structure that runs through their middle.

SPIRAL GALAXIES
These galaxies are composed of a central core surrounded by a disc of stars. This disc separates into long, curved 'arms'.

WHAT IS GRAVITY?

Gravity is one of the most important things in the universe – without it nothing would stay in place. It is a force that pulls objects together, and the strength of it depends on the mass of the objects. Mass is calculated by the amount of matter, or physical substance, an object has. Earth's gravity is quite strong, because it is a planet with a large mass. This means that everything on Earth, including you, is pulled towards its centre. The Moon's gravity, on the other hand, is much weaker. So if you were to jump upwards on the Moon, it would take much longer for you to be pulled back down. In space, all bodies (such as planets and moons) are pulled towards one another by gravity. This is what keeps planets in orbit around the Sun.

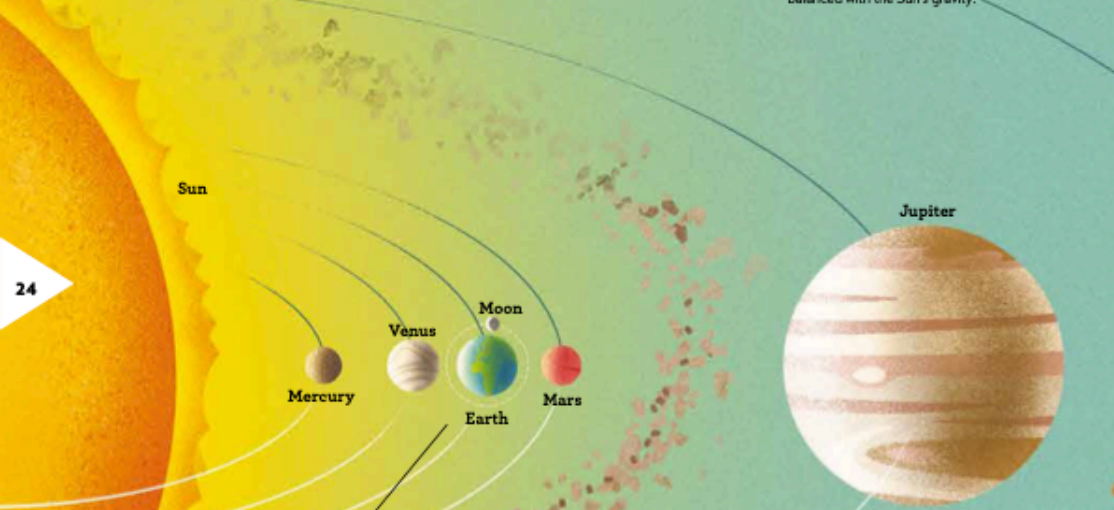
THE SOLAR SYSTEM

The Earth is not the Sun's only satellite. Many other planets and celestial bodies also orbit this star. In total there are eight planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. There are also several dwarf planets, many moons, asteroids and comets and an awful lot of dust.

THE PLANETS' ORBITS
The path that a planet takes around the Sun is called an orbit. Planets are kept on these paths by a specific, and delicate, balance of forces. When something moves, it will go in a straight line unless something pushes or pulls it – this is called momentum. Planets are kept in orbit around the Sun because their momentum is balanced with the Sun's gravity.

HOW DID IT START?
The solar system was formed approximately 4.6 billion years ago. Everything started with a cloud of gas and dust (see image 1 above), which was pulled together by gravity into a disc shape (see image 2). Because of immense pressure, the cloud collapsed in on itself and the Sun was born (see image 3). The planets came from all of the leftover dust and gas.

THE OORT CLOUD
This is the farthest part of our solar system, made of pieces of icy space debris. Scientists think that the Oort Cloud is where most comets come from. Comets are chunks of space rock, covered in ice. They are often called 'dirty snowballs'.



PLUTO
Pluto was once the ninth planet in the solar system. However, it is now classified as a dwarf planet because it is so small. Astronomers have discovered several other dwarf planets of similar size to Pluto.

KUIPER BELT
Beyond the planets, in an area that is very far from the Sun, is the Kuiper Belt. This huge expanse holds a collection of rocky objects. Scientists think that many of these objects are leftovers from the formation of the solar system.

THE EARTH'S AVERAGE ORBITAL SPEED
This is the speed at which the Earth moves around the Sun. It is approximately 30 km per second.

ASTEROID BELT
In between Mars and Jupiter there is an area that is full of hundreds of rocky objects. The objects are called asteroids. They move in elliptical (oval-shaped) orbits around the Sun. However, the force of a nearby planet's gravity can pull one off course. This can cause the asteroid to crash into the surface of a planet or moon somewhere else in the solar system. The impact of this collision can form a crater.

ROCKY PLANETS AND GAS GIANTS

When the planets in our solar system were formed, they were all subject to different conditions. The four planets that are closest to the Sun were exposed to very high temperatures, which caused them to form out of rocks. These planets are called the inner, rocky planets. The outer planets have a different composition. Jupiter and Saturn are called gas giants and don't have solid surfaces – so you wouldn't be able to stand on them. Farthest from the Sun are Uranus and Neptune, which lie in a super-cold area of the solar system; they are often called ice giants.