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REVIEW: PLANET EARTH

The Universe

It is the totality of space, that is, of all forms of matter. It is 13,800 million years old. Its beginning was Big Bang. Since then, the Universe started to expand. It is composed of more than 100,000,000,000 galaxies. A Galaxy is a huge group of planets, stars, gas clouds and cosmic dust.

Milky Way

One of these galaxies is the Milky Way that has a spiral way. Its name comes from Greek mythology. It was said that it was the milk spilled from the breast of the goddess Hera. It is composed of millions of stars.

The Solar System

It consists of a single star, the **Sun**, and the **planets** that orbit it:

- The Sun, which sends out energy to the rest of the Solar System, is a huge mass of hot gases.
- There are eight planets: **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune**.
- Most planets in the Solar System have one or more **satellites**, which are astronomical bodies that orbit them.

The Earth

Our own planet is the fifth biggest planet in the Solar System. It has a surface area of 510 million square kilometres (km^2). It is the third closest planet to the Sun, which is 150 million km away. The Earth only has one satellite: the Moon.

The Earth is the only planet in the Solar System where life exists. The following conditions make this possible:

-The Earth has the ideal **temperature** for life. It is the right distance from the Sun so it is not too hot or too cold.

-The **atmosphere** is a layer of gases that protects the Earth from the Sun's radiation. It contains essential gases, like oxygen.

- **Water** is necessary for all living things.

The movement of the Earth

Like other objects in the Solar System, the Earth moves all the time. It has two types of movement:

- **Rotation**: the Earth spins continually on its own axis in a west-to-east direction. It takes 24 hours to complete one rotation. It causes the alternation of **day** and **night**. The Earth is spherical so the Sun cannot illuminate the whole planet simultaneously.

Consequently, it is always day on only one side of the Earth's Surface, where it receives the Sun's rays. On the other side, it is night.

- **Revolution**: at the same time, the Earth moves around the Sun in an **elliptical orbit**. It takes 365 days and six hours to complete one revolution. As a year only has 365 days, there is a **leap year** every four years, when we add an extra day to the month of February. The Earth is **tilted** so the angle of the Sun's rays changes in each hemisphere during the year. This causes the **seasons**.

At the Equator, the Sun's rays reach the Earth vertically all the year round so there is little difference between the seasons. However, further from the equator, the seasons are reserved in the two hemispheres:

- In **summer**, the Sun's rays reach one hemisphere almost vertically. At the same time, it is **winter** in the other hemisphere.
- In **spring** and autumn, the Sun's rays reach both hemispheres at a similar angle.

The four seasons begin at the solstices and equinoxes:

- Summer and winter: at the two **solstices** (around 21 June and 21 December), the Sun's rays are vertical at one of the tropics. Days are long and warm in one hemisphere, but short and cold in the other.
- Spring and autumn: at two **equinoxes** (around 21 March and 23 September), the Sun's rays are vertical at the equator. Both hemispheres receive the same amount of sunlight, and day and night are equally long.

The geographic coordinates: It is a grid of imaginary lines that help us to find the exact location of a place on Earth. These lines are called parallels and meridians.

-**Parallels and Latitude**:

The parallels are imaginary circles running in an east-west direction. The main parallel is the **Equator** that divides the Earth into two hemispheres: the northern hemisphere and the southern hemisphere. Other important parallels, from north to south, are: the Arctic Circle; the Tropic of Cancer; the Tropic of Capricorn; the Antarctic Circle.

The Latitude is the distance between a place of the Earth and the Equator. The Latitude can be north or south. It is mesured in degrees (°), minutes (') and seconds (''). The maximum value of Latitude is 90°. So, the North Pole is 90 degrees N Latitude, and the South Pole is 90 degrees S Latitude.

- Meridians and Longitude:

The meridians are imaginary semicircles running in a north-south direction from the North Pole to the South Pole. The prime meridian is also called the Greenwich meridian that divides the Earth into two hemispheres: the western hemisphere and the eastern hemisphere.

The Longitude is the distance between a place of the Earth and the Greenwich meridian. The Longitude can be east or west. It is also mesured in degrees, minutes and seconds. The maximum value of Longitude is 180°.

Time zones: They are 24 imaginary vertical bands in the terrestrial sphere of 15° degrees of length each that were created to make the time around the world correspond to the position of the Sun.

The Earth is a sphere (360°), and takes 24 hours to rotate on its axis. It takes one hour to move the equivalent of 15° because 24 × 15 = 360. Consequently, the Earth is divided into 24 time zones, which go from pole to pole. It is the same time everywhere inside a time zone.

Time zones are measured from the Greenwich meridian:

-If we go east, we move the clock forward by one hour as we go through each time zone.

-If we go west, we move the clock back by one hour as we go through each time zone.