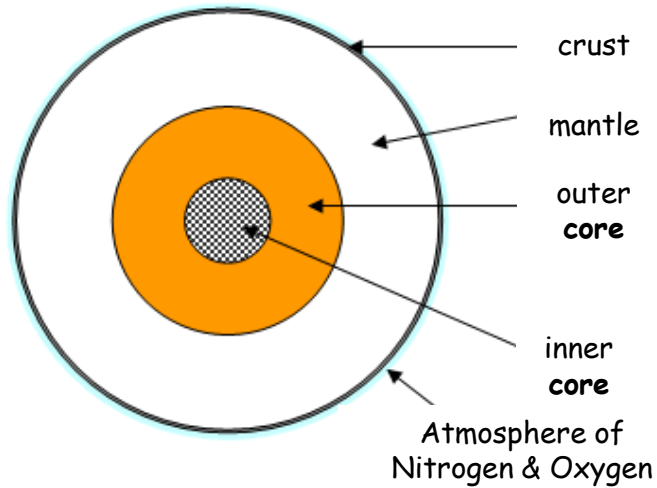
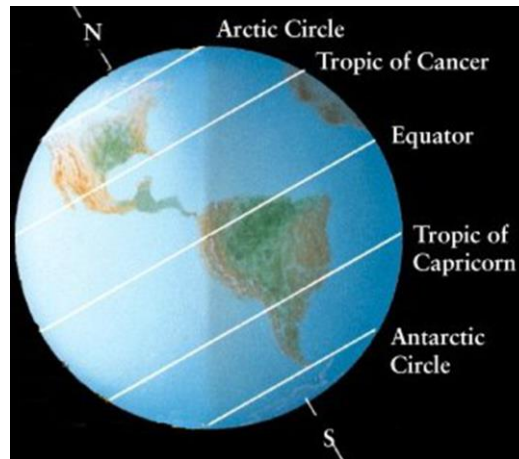


Astronomy Summary Knowledge Organiser – Ch. 1 (Topic 1) Planet Earth - structure / latitude & longitude



The **SHAPE** of the Earth is an **OBLATE SPHEROID** (a slightly flattened sphere)
The mean **diameter** of the Earth is **13 000 km**
The mean **radius** of the Earth is **6500 km**
Earth's **POLAR DIAMETER** is **42km smaller** than its **EQUATORIAL DIAMETER** due to its squashed ball shape
It is the **largest of the rocky/terrestrial inner planets**
70% of the surface is covered in WATER



When giving the **LOCATION** of a place or **MAJOR DIVISION** on the Earth's surface we use a **coordinate system** that provides two values - **LATITUDE** and **LONGITUDE**.

When giving a locations lat. & long. it is important to include one of the **4 CARDINAL POINTS** (N,E,S,W) with each value.

The **6 major divisions** of the Earth's surface are:

EQUATOR - **latitude is measured from the equator**, therefore its own latitude is **0 degrees**. It is drawn as a **horizontal line** that cuts the Earth in half across the middle. **LATITUDES** must provide a **number value** (that tells us the angular distance the location is away from the equator) and either be **North or South**, eg. **15°N**.

PRIME MERIDIAN - **longitude is measured East or West of the Prime Meridian** and so it is **located at 0° long**. This particular meridian runs through the famous astronomical observatory at **Greenwich** in London and was adopted as the '**worlds zero of longitude**' in 1884. This major division should be drawn running from North pole to South pole and passing through Greenwich.

TROPIC OF CANCER - positions on the Earth's surface where the **Sun will be directly overhead on June 21st (Summer Solstice)**. The Tropic of Cancer has a **latitude of 23.5°N** because on June 21st the Earth is **tilted directly towards the Sun** by that angle.

TROPIC OF CAPRICORN - positions on the Earth's surface where the **Sun will be directly overhead on December 21st (Winter Solstice)**. Its **latitude is 23.5°S** because on December 21st Earth is **tilted directly away from the Sun** by that angle.

ARCTIC CIRCLE - this division shows us the locations furthest North where you can **see the Sun rise & set every day of the year**. The **latitude of the Arctic Circle is 65.5°N**. If you go further North than this there will be days in winter when the Sun will not rise above the horizon!

ANTARCTIC CIRCLE - shows us the locations furthest South where you can **see the Sun rise & set every day of the year**. Its **latitude is 65.5°S**. If you go any further South than this there will be days in winter when the Sun will not rise above the horizon and days in summer where it never sets!

As shown in the diagram above the Earth has **4 MAJOR INTERNAL DIVISIONS**.

CRUST - **SOLID** but **VERY THIN** (ranging from 0-70km thick). There are **2 types of crust** - **Continental crust** is **older** and is made of **low density rock** such as granite. **Oceanic crust** is **younger** and is composed of **darker, denser** rocks such as basalt. It is also much **THINNER**, only up to 10km thick. The crust is **split into** a number of continent-sized **TECTONIC PLATES**.

MANTLE - the **SILICATE** mantle extends half-way to the centre of the Earth and makes **up 80% of Earth's volume!** The **upper mantle** is **SEMI-MOLTEN** and has **thermal convection currents** rising & falling within it, these drive the sideways motion of the tectonic plates **floating** above it.

OUTER CORE - has a **temperature** of approx. **5000K** and is made of **LIQUID iron & nickel**. Within the outer core there are **currents of charged particles flowing** that generate the Earth's protective **MAGNETIC FIELD**.

INNER CORE - although it has a **temperature** of approx. **5500K** the inner core is **SOLID**. Although its temperature is about the same as the Sun's photosphere the **iron & nickel cannot melt** due to the **extremely HIGH PRESSURE** within the inner core!

The Earth's **atmosphere** has important effects on the observations we make from its surface! Firstly, observations are **restricted to night time** because during the day **THE SKY IS BLUE** since blue light is most scattered by Oxygen & Nitrogen molecules. **SKYGLOW** is a rusty orange haze seen above urban areas and it **reduces contrast**, making fainter objects more difficult to see. Finally, due to light being **refracted**, **SEEING CONDITIONS are variable** and **stars appear to 'twinkle'**