

# Summary – Earth and Space

## Stars, planets and solar systems

A **star** is a big burning **ball of gas**. Stars are mostly made of **hydrogen** and **helium** and the nearest star to the earth is our **sun**. When stars “**die**” they collapse and become **black holes**.

**Planets** can be **solid, liquid or gas** but are not burning. A **solar system** is a **number of planets** orbiting (going round) a star. A **galaxy** is **many solar systems**. The name of our galaxy is the **Milky Way** Stars and planets **orbit** due to the force of **gravity**.

## Days, Months and Years

A **day** is the time it takes for the **earth to rotate once**.

A **month** is (roughly) the time it takes for the **moon to orbit the earth once**. We see “**phases**” of the moon due to **different parts of the moon being lit** by the sun.

A **year** is the time it takes for the **earth to orbit the sun once**.

**Seasons** occur due to the **tilt of the earth**. The **rays** from the sun hit us at **different angles** throughout the year leading to hotter (rays hitting “straight on”) and colder (rays hitting at an angle) times.

## Inside the Earth

The **layers of the earth** are (from the outside in) “**crust**”, “**mantle**”, “**inner core**” and “**outer core**”. The **temperature increases** as you go **towards the centre** of the earth.

## Types of Rocks

There are three main types of rock. **Igneous** rocks are formed from **volcanic lava**.

**Sedimentary** rocks are formed from **layers of sand** and **metamorphic** rocks are formed when **sedimentary** rocks are applied with lots of **heat and pressure**. Sedimentary rocks weather quickest when **rain and human erosion** breaks them up. **Acid rain** can also **dissolve** sedimentary rocks. Rocks can be **identified** by **colour, feel** or reaction with **acid**.

## Ores

Ores are **rocks with useful metals** in them. We can tell which metal by the **colour** the ore makes in a **flame**. **Sulphide** (containing sulphur) ores **produce yellow sulphur** and smelly **sulphur dioxide** ( $\text{SO}_2$ ) when heated. **Carbonate** (containing carbon and oxygen) ores produce **carbon dioxide** when heated. Carbon dioxide turns **lime water milky**.

## Extracting Metals from Ores

Some metals can be **extracted** (separated) from their ores simply by **heating**. Some need to be **heated with carbon** and some need **electricity** (electrolysis). Iron is separated from **iron ore** by heating with carbon monoxide in a **blast furnace**.

## Fossil Fuels

Fossil fuels are made from **dead plants and animals** that have laid underground for millions of years. **Heat and pressure** turns the **dead plants** into **coal** and the **dead animals** (mostly sea creatures) into **oil**. We can make **oil useful** by **distilling** it. Different “fractions” have different boiling points.

## Sea Salt

Sea salt is mostly made of **sodium chloride**.