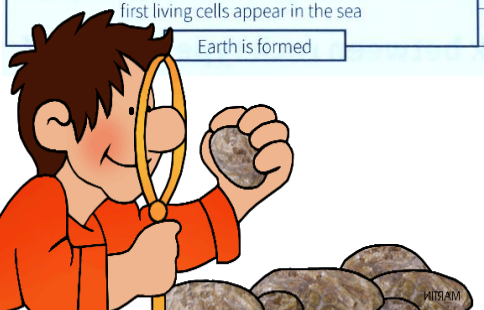
Y8 Geology Knowledge organiser

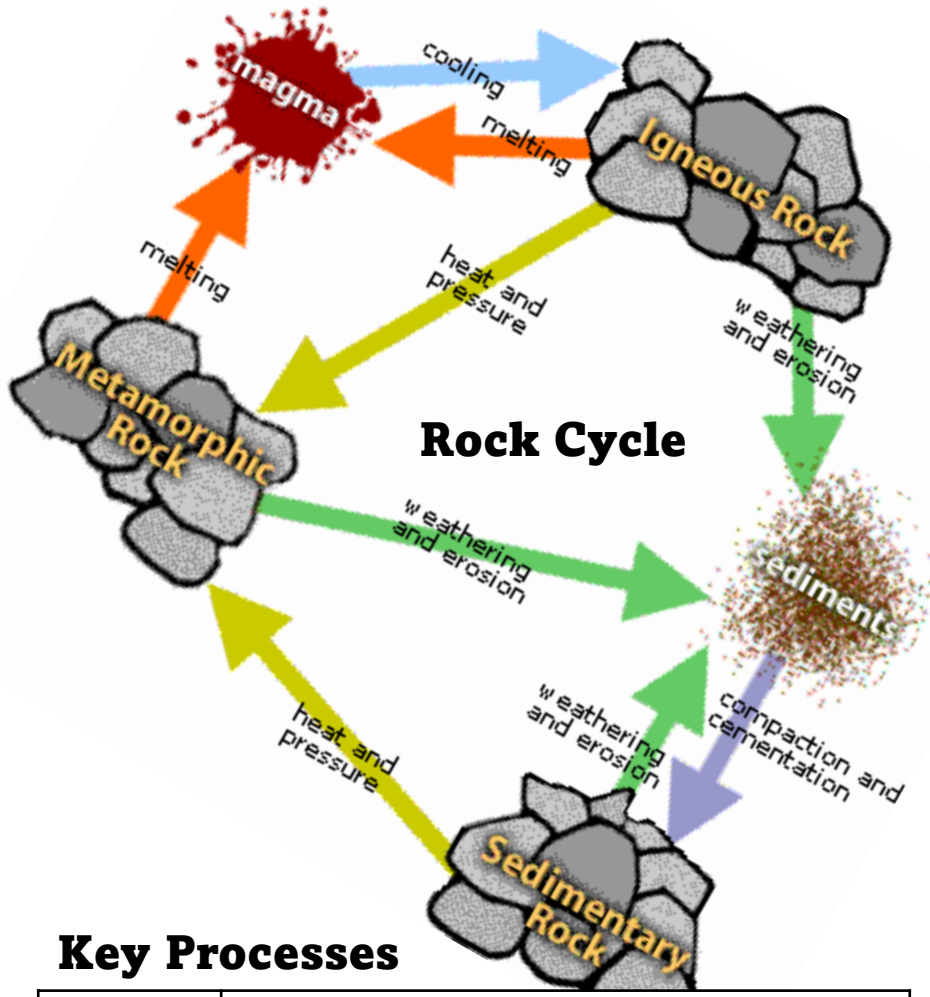
Geological time

Era	Period	How long ago?
	THE PHANEROZOIC EON (OURS)	
		today
Cenozoic (recent life)	**Quaternary** we (*Homo sapiens*) appear and spread	
		2.6 mya
	Neogene apes, chimpanzees, rhinos, horses, sheep …	
		23 mya
	Paleogene mammals and birds flourish	
		66 mya
Mesozoic (middle life)	**Cretaceous** dinosaurs rule; period ends with their extinction	
		145 mya
	Jurassic more dinosaurs appear; first birds	
		200 mya
	Triassic first dinosaurs and mammals	
		250 mya
Paleozoic (ancient life)	**Permian** first conifer trees; warm-blooded reptiles	
		290 mya
	Carboniferous on land: lush forests, reptiles, giant insects	
		300 mya
	Devonian first animals on land	
		420 mya
	Silurian first bony fish; more land plants	
		445 mya
	Ordovician first land plants	
		485 mya
	Cambrian first animals with shells appear in the sea	
		540 mya
	THE PRECAMBRIAN EON first soft-bodied animals appear in the sea	600 mya
	first living cells appear in the sea	3.5 bya
	Earth is formed	4.5 bya



Rock types

	Sedimentary	Metamorphic	Igneous
Name two examples	Sandstone and Limestone and Chalk and coal	Marble and Slate	Granite and Basalt
Does it contain layers?	Yes	Thin layers	No
Is it soft or hard?	Soft	Harder than sedimentary	Hardest
How are they formed?	Erosion breaks up the rocks and weathering moves the bits away. These grains are fixed together by compaction and cementation.	Extreme pressures and temperatures on sedimentary rock make metamorphic rocks	The inside of the earth is very hot – hot enough to melt rocks. Molten (liquid) rock forms when rocks melt. The molten rock is called magma. When the magma cools and solidifies igneous rock forms.
Contain fossils?	Yes	Twisted fossils	no



Key Processes

Weathering	The weakening and loosening of rock **in-situ** by **Biological** (plants & animals), **Chemical** (water dissolving calcium carbonate) or **Mechanical** means (freeze-thaw)
Erosion	The breaking up an removal of rock by **geological agents** (rivers, glaciers, wind & waves)
Transport	Rock and sediment is moved by the action of **geological agents** (rivers, glaciers, wind & waves)
Deposition	Rock and sediment is dropped when the **geological agents** (rivers, glaciers, wind & waves) loose energy

Structure of the Earth

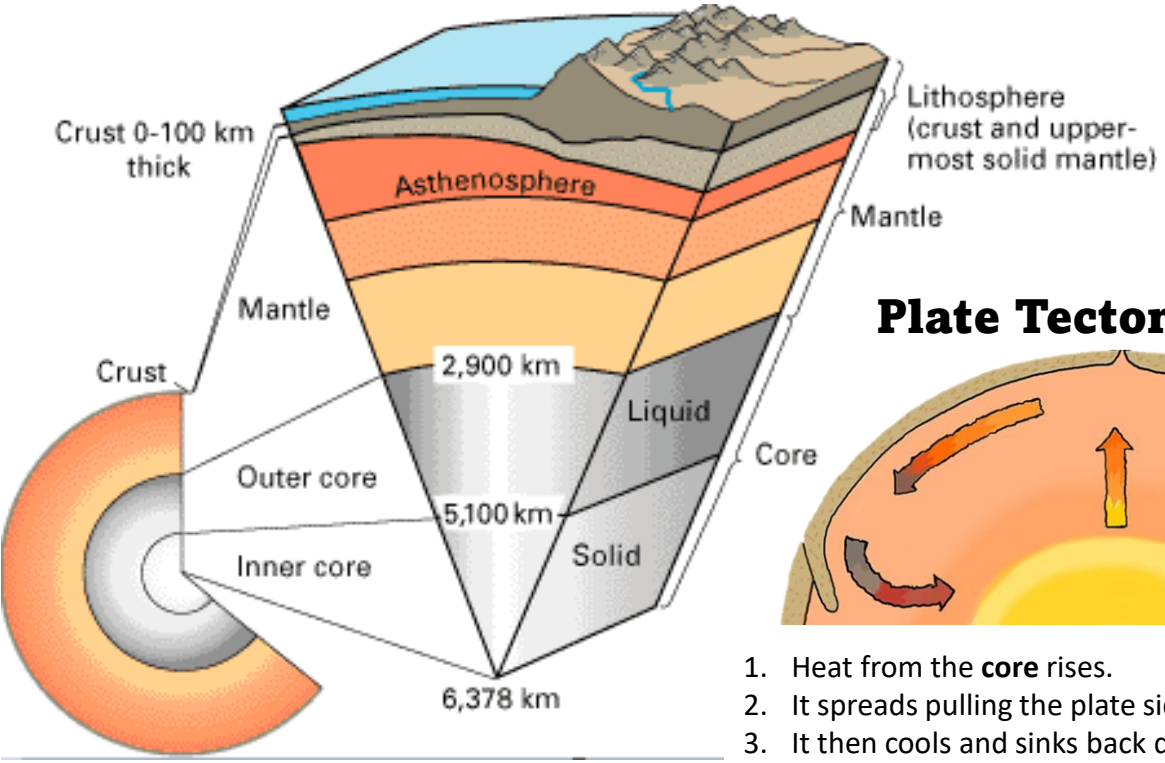
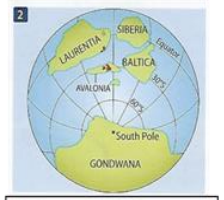


Plate Tectonics

1. Heat from the **core** rises.
2. It spreads pulling the plate sideways with it.
3. It then cools and sinks back down towards the core.
4. This is called **Plate Tectonics** and it is what causes our continents to move.

British Isles on their travels

550 mya (million years ago). The land that will become the British Isles is in two places, far apart (see the red patches). Most of it is quite far south in Gondwana. The rest is in Laurentia.



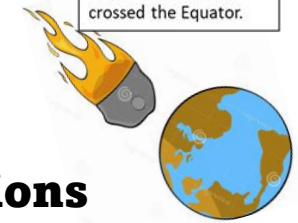
450 mya. A mini continent, Avalonia broke away from Gondwana some time ago and is now heading north (look where the red patches are)

395 mya. Avalonia and Baltica have collided with Laurentia. The land which will form the British Isles is together at last.

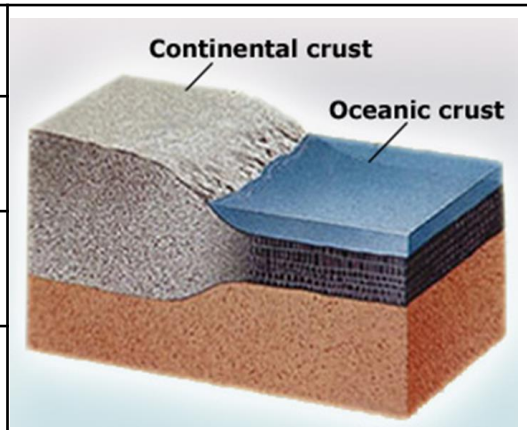
300 mya. Now all of Earth's land has joined to make a super-continent called Pangaea. And look; the British Isles has now crossed the Equator.

65 mya. Pangaea lasted for about 100 million years. Then it broke up to form new continents. They should look familiar!

Today. The continents as they are today. The are still moving very slowly, so if you come back in another 100 million years the world



Types of tectonic plate (crust)

Thick (25 to 100km)		Thin (5 to 10km)
Mostly **Granite**		Mostly **Basalt**
Less dense (wont sink)		Very dense (so it sinks)
VERY old (3.4 billion years)		Less old (180 million years)

Fossils

After an animal dies the soft parts of its body **decompose** leaving the hard parts, like the skeleton behind. This becomes buried by small particles of rock called **sediment**.

As more layers of sediment build up on top, the sediment around the skeleton begins to **compact** and turn to rock.

The bones then start to be dissolved by water seeping through the rock. **Minerals** in the water replace the bone, leaving a rock replica of the original bone called a **fossil**

Mass extinctions

Volcanic eruption theory	Huge volcanic eruptions let out vast amounts of sulphur dioxide gas. This makes the Earth cold and over the next hundred or thousand years, the Earth was gripped by a terrible winter. Many plants & animals couldn't survive!
Asteroid Theory	A 10km wide asteroid travelling at great speed struck the Earth. The blast and shockwave killed everything in its path. Billions of tonnes of dust were thrown into the air and the sky turned black. With no light, the plants died. Shortly after all the animals would have died, too.