Science Knowledge Organiser

Term: Autumn 1 | **Year: 3** | **Chemistry: Fossils**

BIG QUESTION: WHAT NATURAL OBJECTS LINK SCIENCE WITH HISTORY AND GEOGRAPHY?

Scientists

Mary Anning

Fossil Hunter

Mary Anning was born on 21 May 1799. She lived in the English seaside town of Lyme Regis in Dorset. When she was just 12 she discovered an ancient reptile called an **ichthyosaur** (which means 'fish lizard'). She more incredible discoveries in her life, including **plesiosaur** and a **Dimorphodon.**

Mary's Plesiosaur

Key Knowledge & Vocabulary

Fossil
The preserved remains, or traces, of animals or plants that were once living.

Fossilisation
The process by which a fossil is formed.

Dies
Stops living.

Decays
Gradually breaks down and wastes away.

Remains
What is left behind when some parts have decayed or been destroyed.

Preserved
Kept or saved from decay.

Pressure
The force over a given area. The action of pushing steadily against something.

Minerals
Non-living materials that come from Earth e.g. gold, silver, iron and magnetite.

Erode
The gradual removal of soil or rock through natural causes such as wind, water and ice.

What can fossils tell us?

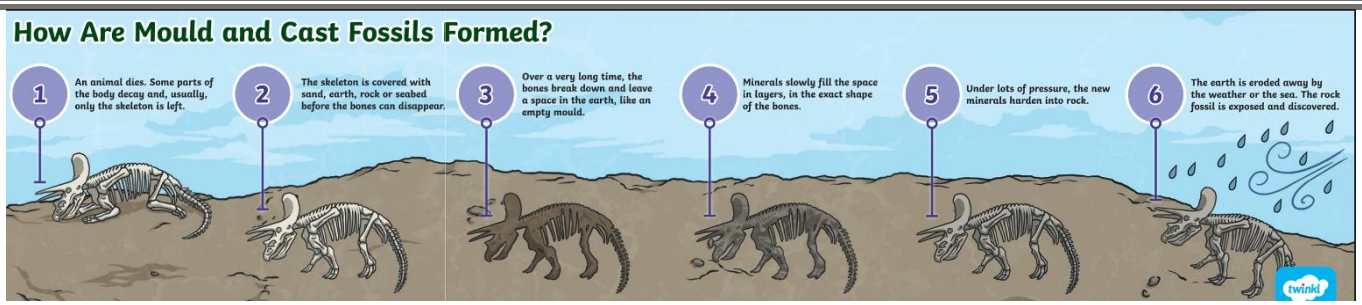
Fossilised Stegosaurus

What are fossils?

Fossils are **the remains or traces of plants and animals that lived a long time ago**. Fossils help scientists understand what life was like millions of years ago. Some fossils provide important evidence for evolution because they show that living things have changed over time.

Fossilised Ginkgo

The Fossilisation Process



Learning Links

Builds on:	What I am learning now:	Leads to:
Y2 Chemistry: Materials	**Y3 Chemistry: Rocks, Soils and Fossils**	**Y4 Chemistry: States of Matter**

Science Knowledge Organiser

Term: Autumn 2 | **Year: 3** | **Biology: Plants**

BIG QUESTION: WHAT MAKES LIFE GO ON?

Functions of Parts

Roots

Roots anchor the plant in the ground. They also absorb water and nutrients from the soil.

Stem or Trunk

The stem or trunk holds the plant up, carries water and nutrients from the roots to the leaves.

Leaves

Leaves make food for the plant by using sunlight and carbon dioxide from the air.

Key Knowledge & Vocabulary

Nutrients
The minerals that plants need to help them grow.

Pollen
A fine powder produced by some plants.

Pollination
The process of transferring pollen from one part of a flower to another or between flowering plants.

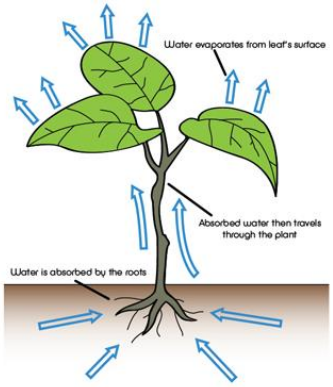
Seed formation
The process of making seeds so that new plants can grow.

Seed dispersal
The scattering or spreading of seeds to different places.

Reproduce
The creation of new plants by one or more parent plants.

Germinate/germination
The process by which a plant grows from a seed.

WATER TRANSPORTATION



Water transportation
The way water is moved from one part of a plant to another.

Absorb/absorption
The act of soaking up (absorbing) a substance, such as water.

Functions of Flowers

Attract Insects

Brightly coloured petals attract insects and birds.

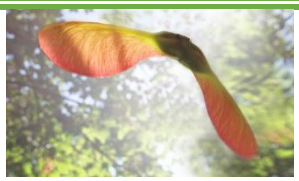
Pollination

Insects, birds, bats or the wind take pollen from one part of the flower to another or between flowering plants.

Seed Formation

Once a flower has been pollinated, it can make seeds and reproduce.

Seed Dispersal



Some seeds are transported by the wind and are shaped to float, glide or spin through the air.

Plants may use water to transport their seeds. Some seed pods are designed to explode and throw the seeds a good distance from the parent plant.

Many plants use animals to carry their seeds using hooks which attach to an animal's fur or making tasty fruit to enclose the seeds, which attract animals to eat them.

Learning Links

Builds on:	What I am learning now:	Leads to:
Y2 Biology: Plants	**Y3 Biology: Plants**	**Y5 Biology: Living Things and their Habitats**

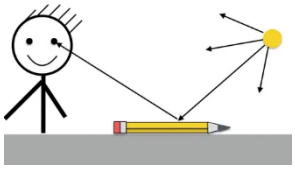
Science Knowledge Organiser

Term: Spring 1 | **Year: 3** | **Physics: Light**

BIG QUESTION: WHAT IS THE DARK?

Why do we need light?

Light to See



We need light to see things. If there is no light, then it is dark and we cannot see anything.

Light Sources

Some light sources are natural, like fire. Some light sources are artificial, like computer screens.

Sunlight

The light from the sun can damage our eyes. We should never look directly at the sun. we can protect our eyes by wearing sunglasses or a hat.

Key Knowledge & Vocabulary

Dark
The absence of light.

Energy
A supply of power. The ability to do work. We use energy to do work.

Light
A form of energy. It travels in a wave from a light source.

Light source
An object that makes its own light. Where light comes from.

Ray
Waves of light are called light rays or beams.

Reflect
To throw back or bounce light from a surface.

Reflection
When light hits a surface and bounces off.

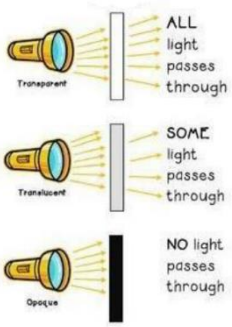
Reflective
An object or material that reflects light well.

Shadow
An area of darkness caused where light has been blocked.

Transparent
Allows light to travel through easily. See through or clear.

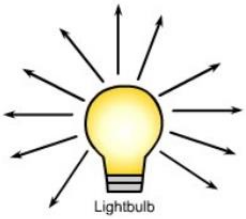
Translucent
Allows some light to pass through. Almost see through.

Opaque
Does not let any light pass through. Cannot see through it.



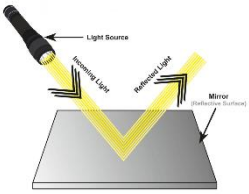
How does light travel?

Rays or Waves



Light travels in a straight line. Waves of light are called light rays.

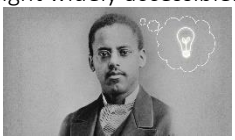
Reflections



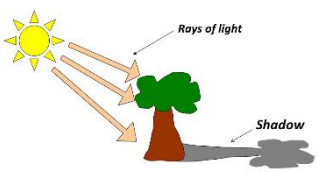
When light hits an object, it is reflected or bounces off. Smooth, shiny surfaces reflect light best.

Lightbulb Moment!

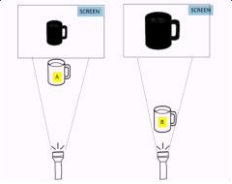
In 1879, Thomas Edison produced a cheap, long-lasting electric light bulb. His design was improved by Lewis Latimer. Their innovations made electric light widely accessible.



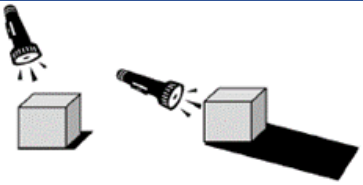
What are shadows and how do they change?



A shadow is formed when light is blocked by an opaque object.



The closer the object is to the light source, the bigger the shadow.



The higher the light source, the shorter the shadow.

Learning Links

Builds on:	What I am learning now:	Leads to:
Y1 Physics: Seasonal Changes	Y3 Physics: Light	Y4 Physics: Sound

Science Knowledge Organiser

Term: Spring 2 | **Year: 3** | **Biology: Nutrition**

BIG QUESTION: DO LIVING THINGS NEED DIFFERENT THINGS TO SURVIVE?

What are nutrients?

Carbohydrates

Starchy carbohydrates give you energy.

Fibre and Water

Fibre helps you digest the food you have eaten. Water moves nutrients around your body and helps to get of waste.

Vitamins

Vitamins keep your body healthy.

Key Knowledge & Vocabulary

Balanced Diet
Eating a wide variety of foods to stay healthy. Humans need to eat the right types and amounts of nutrition to maintain a healthy body weight.

Diet
The food and water an animal or human eats and drinks.

Energy
A supply of power. The ability and strength to do work or physical things.

Healthy
To be physically and mentally well. To be free from any illness.

Nutrients
Substances that help plants and animals to grow.

Nutrition
Food needed to live. The process of taking food into the body and absorbing the nutrients in those foods.

Eatwell Plate and Food Groups

What are nutrients?

Protein

Protein helps your body to grow and repair itself.

Minerals

Minerals keep your body healthy. Calcium helps to build bones and keep teeth healthy.

Fats and Oils

Fats and oils give you energy.

Elsie Widdowson (1906 – 2000)

When Elsie Widdowson was born in 1906, people did not know much about the content of the food they ate.

She was a pioneer nutrition scientist. Elsie researched the energy, protein and other nutritional values of many foods. Her work formed the basis of modern nutritional thinking.

Elsie's research into food and health was important during World War II. Her advice helped to keep people healthy when food was rationed.

Elsie also studied the impact of children's diets on their health and growth. She discovered the importance of vitamins and minerals in children's diets.

Learning Links

Builds on:	What I am learning now:	Leads to:
Y2 Biology: Animals, including Humans	**Y3 Biology: Animals, including Humans**	**Y4 Biology: Animals, including Humans**

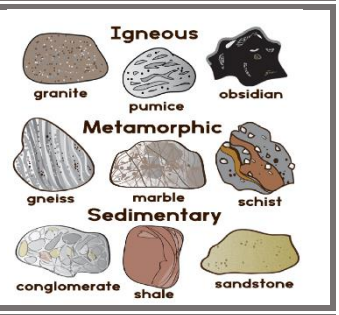
Science Knowledge Organiser

Term: Summer 1 | **Year: 3** | **Chemistry: Rocks and Soils**

BIG QUESTION: ARE ALL ROCKS THE SAME?

What are Rocks?

Natural rocks



Man-made rocks

Man-made rocks are rocks that are made by people. E.g. bricks and concrete.

They are made from natural materials like sand and clay and are useful for building.

Are all rocks the same?

Hard or soft?
Some rocks e.g. marble and granite are very hard. Others like clay and chalk are easily cut.
Permeable or impermeable?
Rocks that allow water to soak into them are called permeable.
Durable?
Durable rocks are more resistant to being eroded by wind or rain.

Key Knowledge & Vocabulary

Igneous
Rock that has been formed from magma or lava.

Impermeable
Does not allow liquids and gases to pass through.

Lava
Molten rock that comes out of the ground.

Magma
Molten rock that remains underground.

Metamorphic
Rock that started out as igneous or sedimentary rock but changed due to being exposed to extreme heat or pressure.

Permeable
Allows liquids and gases to pass through.

Rock
A solid material made from one or more minerals.

Sedimentary
Rock that has been formed by layers of sediment being pressed down hard and sticking together. You can see the layers of sediment in the rock.

Soil
The uppermost layer of the Earth.

Types of Soil

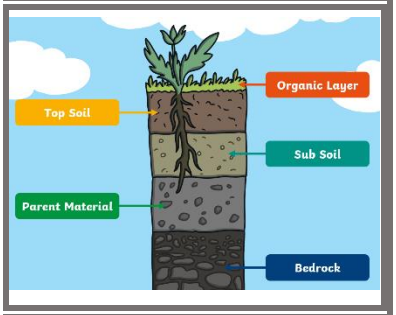
What is Soil?

What is soil made from?

Soil is the uppermost layer of the Earth. It is made from:

- Minerals
- Water
- Air
- Organic matter (plants and animals)
- Micro-organisms

Layers of soil



Are all soils the same?

Soil is a natural resource and differ for many reasons, including:

- the parent material
- the climate and terrain
- the type of plant life and vegetation
- human influence

How are natural rocks formed?

Igneous: formed when lava or magma cools. E.g. granite and basalt.

Sedimentary: formed from layers of sediment. E.g. limestone and chalk.

Metamorphic: formed when igneous or sedimentary rocks are changed due to being exposed to extreme heat or pressure. E.g. slate and marble.

Learning Links

Builds on:	What I am learning now:	Leads to:
Y2 Chemistry: Everyday Materials	**Y3 Chemistry: Rocks and Soils**	**Y4 Chemistry: States of Matter**

Science Knowledge Organiser

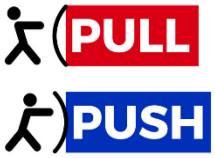
Term: Summer 2 | **Year: 3** | **Physics: Forces and Magnets**

BIG QUESTION: WHAT CAN MAGNETS DO?

Friction

What is a force?

A force is a push or a pull. Forces will change the motion of an object. They will make it start to move, speed up, slow down or stop.



What is friction?

When two objects come into contact with each other, there is friction. If an object is moving, e.g. cyclist, runner, car, the surface it travels over can exert a force on it, slowing it down or stopping it from moving. This force is called friction.

Why do some surfaces create more friction?

The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object.

Key Knowledge & Vocabulary

Attract/attraction
Attraction is a force that pulls objects together.

Gravity
A force that pulls things to the ground.

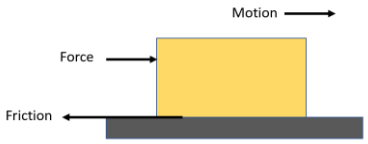
Magnet
An object that produces a magnetic force that pulls certain objects towards it.

Magnetic
Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic.

Magnetic Field
The area around a magnet where there is a magnetic force which will pull magnetic objects towards the magnet.

Forces
A force is a push or a pull on an object. Forces can make an object start or stop moving, move faster or slow down.

Friction
A force that acts between two surfaces or objects that are moving, or trying to move, across each other. Smooth surfaces create less friction. Rough surfaces create more friction.



Pole
North and south poles are found at opposite ends of a magnet.

Repel/repulsion
Repulsion is a force that pushes objects away.

Surface
The top layer of something.

Magnets

How do magnets work?

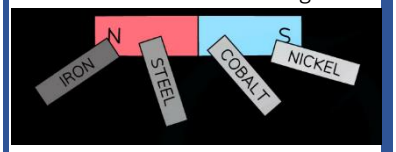
Magnets produce an area of force around them called a magnetic field.

What is a magnetic field?

Some forces, like magnetism, can act at a distance.

Magnetic or Non-magnetic?

Iron, nickel and cobalt are magnetic. Steel contains iron, so steel is attracted to magnets.

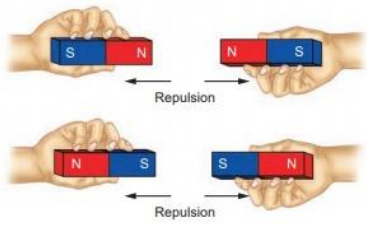


Magnets cannot pull or push anything made of non-magnetic materials.

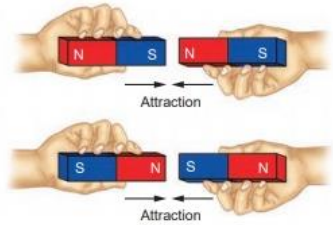
Attract or Repel?

Magnets have two poles – north and south. The strongest parts of the magnet are the poles.

Like poles repel.



Opposite poles attract.



Learning Links

Builds on:	What I am learning now:	Leads to:
Y3 Physics: Light	**Y3 Physics: Forces and Magnets**	**Y5 Physics: Forces**