St Mary Cray Primary Academy – Knowledge Organiser

Science Focus	Animals, including humans	Year 3	Autumn 1

What? (Key Knowledge)

Nutrition	
Things humans need to be healthy	To have a balanced diet of the right amount of different types of food and drink To exercise regularly To be hygienic
What is nutrition?	Nutrition means animals getting the food they need to grow and be healthy.
Can we make our own food?	No. Humans and animals can't make their own food. They get food by either growing it, hunting it or gathering it.
What is meant by hunting and gathering food?	Humans can hunt other animals to eat and they also find foods grown in the wild.
• Skeleton and Muscles	
What is a skeleton?	A skeleton is a structure of bones that supports the body of a person or animal.
Parts of the skeleton	Skull, clavicle, scapula, rib cage, humerus, spinal column, pelvis, ulna, radius, femur, tibia, fibula
Function of the skeleton	Protection, support, movement
What is a muscle?	A soft tissue in the body that contracts and relaxes to cause movement of the skeleton

Diagrams

• Statutory requirements

- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- Identify that humans and some animals have skeletons and muscles for support, protection and movement.

What? (Key vocab)

Spelling	Definition
Tissue	A tissue is part of the body that is made of similar cells
Contact	When a muscles becomes smaller, shorter and tighter
Nutrition	The process of obtaining the food needed for health and growth
Vitamins and minerals	Substances that are found in foods we eat. Your body needs them to work properly, so you grow and develop just like you should.
Fat	Fats fuel the body and help absorb some vitamins. They also are the building blocks of hormones and they insulate the body.
Protein	Proteins grow, maintain, and replace the tissues in our bodies.
Carbohydrate	Sugars and starches, which are found in foods such as starchy vegetables, grains, rice, breads, and cereals.

Possible experiences

- Grouping animals with or without skeletons
- Classifying food by how the human 'gets' them
- Use blue-ac to show the need for warming up muscles
- Experiments to find out which is the strongest muscle group
- Test relationships in the body e.g. does arm span = height

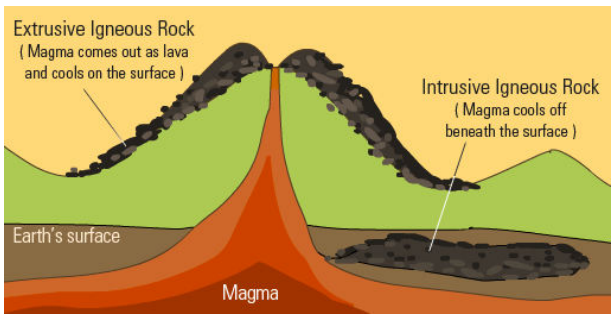
St Mary Cray Primary Academy – Knowledge Organiser

Science Focus	Rocks	Year 3	Autumn 2

What? (Key Knowledge)

What is a mineral?	A naturally occurring chemical with the same properties all the way through.
Rocks	Rocks are made of minerals, fragments of older rocks, or fossils.
Hardness	The most important property for classifying rocks. Hardness is the amount of resistance to scratching.
How is soil made?	From the ground when rocks are worn away (eroded). Soil consists of small bits of rock, organic matter, air, water and living things.
Rock formation	
Igneous	This is when molten rock (magma) has cooled.
Sedimentary	This is when the igneous rocks are worn down and carried by rivers and wind to the sea where they form sediment. Over time, layers of sediment build up and are compressed into rocks. These sometimes contain fossils.
Metamorphic	This when the structure of the rock has been changed due to intense pressure and heat.

Diagrams



• Statutory requirements

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
- Recognise that soils are made from rocks and organic matter.

What? (Key vocab)

Spelling	Definition
Fossil	Any preserved sign of past life more than 10,000 years old.
Magma	Magma is found beneath the surface of the Earth and forms igneous rocks when cooled.
Permeable	A material which allows liquids or gases to pass through it.
Impermeable	A material which does not allow liquids or gases to pass through it.
Solidify	To become hard or solid
Erosion	The gradual destruction or diminution of something
Volcano	A mountain or hill with a crater or vent through which lava, rock fragments, hot vapour, and gas are or have been erupted from the earth's crust.

Possible experiences

- Classify rocks from around the school.
- Survey – Which are the rocks near our school?
- Investigate - Which rock is the most permeable.
- Create own fossils.
- Use cereal to show different layers of soil.
- Design and create a volcano.

St Mary Cray Primary Academy – Knowledge Organiser

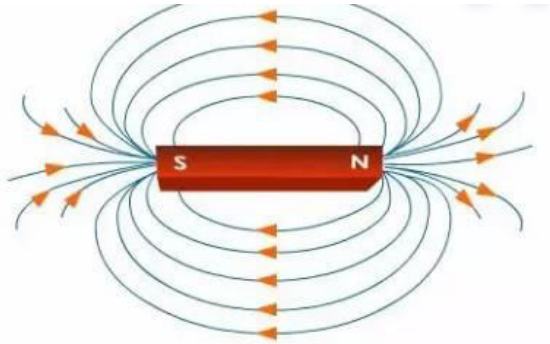
Science Focus	Forces and magnets	Year 3	Spring 1

What? (Key Knowledge)

How does magnetism work?

Magnetic metals	Not all metals are attracted to magnets; only those containing iron, steel and nickel.
Magnetic poles	Magnets have two poles, a north and a south pole. The pole is where the pull of the magnet is strongest. When opposite poles are near to each other they will attract, whereas when the same poles are near to each other they will repel.
Distance	Magnetic forces can act at a distance depending on how strong the magnetic pull is.
Magnetic force	When two magnets are close, they create pushing or pulling forces on one another.
Forces	**Forces are pushes and pulls in a particular direction.** Forces are shown by arrows in diagrams. The direction of the arrow shows the direction in which the force is acting. The bigger the arrow, the bigger the force.

Diagrams



Statutory requirements

- Compare how things move on different surfaces.
- Notice that some forces need contact between two objects
- Observe how magnets attract or repel each other and attract some materials and not others.
- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials .
- Describe magnets as having two poles.
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

What? (Key vocab)

Spelling	Definition
Bar and horseshoe magnets	A **magnet** is an object that is made of materials that create a **magnetic** field. **Magnets** have at least one north pole and one south pole.
Attract	If you put two magnets together with different poles pointing towards one another, the magnets will pull towards each other. We say they attract each other.
Repel	If you try to put two magnets together with the same poles pointing towards one another, the magnets will push away from each other. We say they repel each other.
Magnetic field	The region of space where magnetism can be detected.
North and south pole	All magnets have a north and a south pole *(note: lowercase).*
Magnetic	Something that attracts or repels iron, steel or nickel objects.

Possible experiences

- Challenge the children to make fridge magnets. They could use recycled materials, decorate them and attach a magnet to them.
- http://www.sciencekids.co.nz/gamesactivities/detectivescience/magnets.html This online game will allow the children to apply their knowledge of magnet poles.
- See which metal objects around the house are attracted to a magnet and which ones are not – are all magnetic materials shiny?

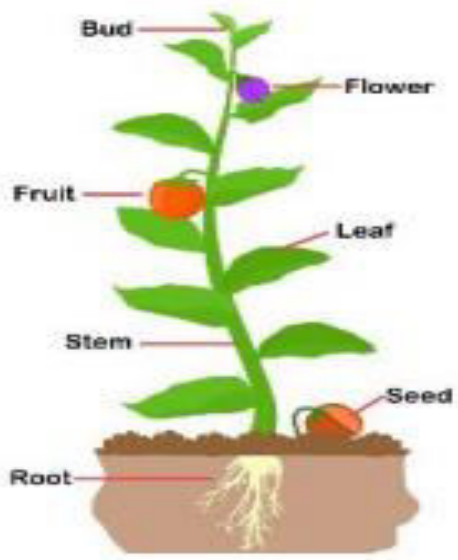
St Mary Cray Primary Academy – Knowledge Organiser

Science Focus	Plants	Year 3	Spring 2

What? (Key Knowledge)

The functions of the different parts of a plant	The petals on a flower are usually bright - this is to attract bees and other insects so that they can collect pollen to make seeds. The seeds are then able to grow to make new plants. This is called germination. Leaves use carbon dioxide and sunlight to make food for the plant.
What do different plants need to grow?	Air, water, sunlight, nutrients from the soil, room to grow, suitable temperature The amount of each of these may vary depending on the type of plant. For example, cacti need less water than other plants.
How is water transported within plants?	The process of water transportation is the way water moves through a plant. The roots absorb water from the soil. The stem transports water to the leaves.Water evaporates from the leaves.

Diagrams and Symbols



What should I already know?

-Which things are living and which are not.
-A variety of common wild and garden plants, including deciduous and evergreen trees and how to identify them.
-Plants need water, light and a suitable temperature to grow and stay healthy.
-Plants and animals depend on each other to survive.

What? (Key vocab)

Spelling	Definition
Absorb	to soak up or take in
Germination	if a seed germinates or if it is germinated, it starts to grow
Fertilisation	in plants, where pollen meets the ovule to form a seed
Carbon dioxide	a gas produced by animals and people breathing out
Pollen	To pollinate a plant or tree means to fertilise it with pollen. This is often done by insects
Transported	taking something from one place to another
Stigma	the top of the centre part of a flower which takes in pollen
Dispersed	scattered, separated, or spread through a large area

Possible experiences

Opportunities to experiment with seeds and flowering plants.
Class plant, children to note and record observations.
Possible visit to local gardens to explore the life cycle of a flowering plant.

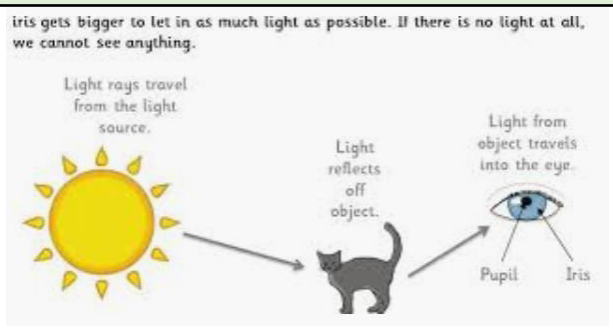
St Mary Cray Primary Academy – Knowledge Organiser

Science Focus	Light	Year 3	

What? (Key Knowledge)

Light sources	Places from which light is emitted: e.g. Sun, candles, torches, fire, etc
Ray model of light	Light travels in straight lines.
Seeing an object	When light reaches an object, it can be absorbed, or it can pass through the object or it can be reflected. Light can be scattered in all directions. Light colours reflect more light than darker colours. White objects reflect nearly all light. Black reflects very little light.
Transparent translucent opaque	Light passes through some materials and not others. Light passes through transparent materials (objects are not 'see through' – light passes through the material). Light passes through translucent materials but the light source is not clear. No light passes through opaque materials.
Shadows	Light is reflected of an object. The area that the light is therefore unable to reach is called a shadow.
Apparent movement of the Sun	Where the Sun is seen in the sky depends upon the rotation of the Earth on its axis. How long we see the Sun each day depends upon the seasons which are created by the tilt of the Earth on its axis.

Diagrams



Statutory requirements

- Recognise that they need light in order to see things and that dark is the absence of light
- Notice that light is reflected from surfaces
- Recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- Recognise that shadows are formed when the light from a light source is blocked by a solid object
- Find patterns in the way that the sizes of shadows change.

What? (Key vocab)

Spelling	Definition
Shadow	**Shadows** are formed when objects block a source of light.
Transparent	A material that allows light to pass through so that objects behind can be distinctly seen.
Translucent	A material that allow some light, but not detailed shapes, to pass through; semi-transparent.
Opaque	A material that blocks all light so is not able to be seen through; not transparent.
Reflection	When light from an object is **reflected** by a surface, it changes direction. It bounces off the surface at the same angle as it hits it.
Refraction	**Refraction** is the bending of light as it passes from one substance e.g. water, to another.

Possible experiences

- Make shadow puppets – try using different colours of paper or card, not just black to challenge misconceptions about shadows. Does blue paper cast a blue shadow? Try using other materials that are transparent but have a colour (like cellophane sweet wrappers), translucent (like tissue paper or wipe oil over paper) or opaque (like card).
- Make a periscope to see over walls or round corners. This works because rays of light hit the mirror of the periscope and are reflected twice. The beam of light is reflected through 90 degrees, because the mirrors are at a 45 degree angle to the path of the light ray.