Knowledge organisers

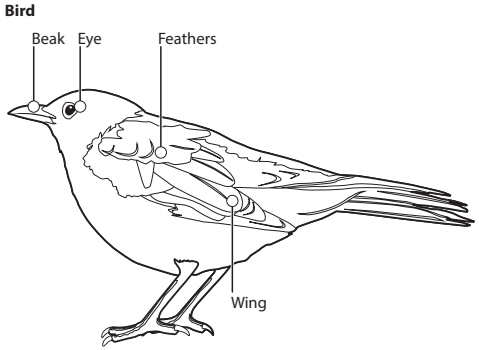
Looking at animals

Key threads

Biology	Working scientifically

Whole-school definition of science

Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.



New Knowledge (what we are going to learn)

Different animals need different types of food

Animals, including humans, have different body parts … and these have special functions to help them survive (including senses)

Animals are grouped into fish, amphibians, reptiles, birds, mammals

Animals can be grouped using observable features

New vocabulary

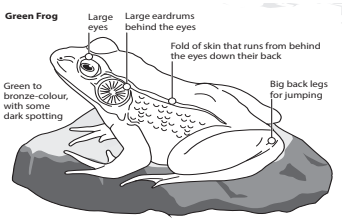
amphibian - are animals such as frogs and toads that can live both on land and in water.

reptile - are a group of cold-blooded animals which have skins covered with small hard plates called scales and lay eggs. Snakes, lizards, and crocodiles are reptiles.

bird - A **bird** is a creature with feathers and wings. Female birds lay eggs. Most birds can fly.

mammal - are animals such as humans, dogs, lions, and whales. Most female mammals give birth to babies rather than laying eggs, and all female mammals feed their young with milk.

nocturnal - creatures are active mainly at night.



Enquiry

Grouping and classifying

Using secondary sources of information to answer questions

Working scientifically

Making careful observations,

Gathering and recording data to help them to answer questions

Prior knowledge (what we all ready know)

Animals – learn about different types of animals such as mammals and reptiles. Why do tortoises have a shell? What animal does the hare remind you of? How is a hare different to a rabbit? .

Animal habitats and food- We will look at where different animals originate from, what they need to thrive, do they live alone or in a pack/group/herd?

Animals – We will learn the words nocturnal and know some animals in each group. (Owls are nocturnal)

Useful vocabulary

fish, amphibian, reptile, bird, mammal, tail, paws, feather, fur, scales, fins, gills, scales, bill, beak, head, claws, down quill, webbed feet, smooth skin
leap, climb, clamber, swing, pad, pace, prowl, pounce, spring, flap, flutter, flop, splash, splash, dive, slither,
hedgehog, fox, bat, badger, night, nocturnal, senses, sight, smell, sonar, food, feeding, roost, sett, burrow, tunnel, nest

What is in your habitat?

Key threads

Biology	Working scientifically

Whole-school definition of science

Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.

Enquiry

Grouping and classifying

Working scientifically

Observations

Gathering evidence to suggest answers to questions

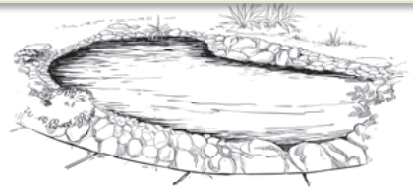
Gathering and recording data to help in answering questions

New Knowledge (what we are going to learn)

Animals and plants can be identified and grouped. This is linked to habitats.

Different plants and animals live in different places to which they are suited. Habitats give them food and shelter.

Animals get their food from plants and other animals and in turn are consumed (eaten) by other animals.



Prior knowledge (what we all ready know)

Animals eat different types of food

Animals, including humans, have different body parts … and these have special functions to help them survive (including senses

Animals can be grouped using observable features

New vocabulary

Habitat - is a natural environment or home of a variety of plants and animals.

Food chains - A food chain can be used to show the way in which these animals depend on each other for energy (food).

Oak tree → mouse → fox

Herbivores - eat plants and parts of plants

Carnivores - eat other animals

Omnivores - eat plants, parts of plants and other animals

Useful vocabulary

alive, living, once-lived, dead, never-lived, plants, animals, decay, rocks, soil, air, water, food chain, plants, animals, direction, source of food, suited, habitat, features, names of habitats, living things and animal body parts

Rock detectives

Key threads

Chemistry	Working scientifically

Whole-school definition of science

Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.

New Knowledge (what we are going to learn)

Different materials including rocks have different properties.

You can group together different kinds of rocks on the basis of their appearance and simple physical properties.

Soils are a mixture of rocks and organic matter

Fossils are formed when trapped with rock

New vocabulary

Limestone is a grey/white rock that was formed from the bones of tiny sea creatures that dropped down to the bottom of the sea when they died. It is used as a building stone, and to make concrete.

Chalk is a softer, white rock and is a type of limestone.

Granite is harder and tough, usually grey to pink in colour and often used for buildings. Granites are made up of crystals, which can often be seen clearly on the surface.

Slate is fine-grained and when expertly cut it will form smooth flat sheets of stone, which have long been used for roofing, floor tiles and other purposes. Slate is frequently grey in colour, especially when seen covering roofs, but can be found in other colours.

Marble is made of limestone that has experienced extreme heat and changed to form a hard rock that is used in buildings and to create sculptures. It can be white but varies in colour, depending on where it comes from

Soils – There are six main soil types: clay, sandy, silty, peaty, chalky, loamy.

Fossils – Most of the creatures that fossils were formed from would have lived in the sea, died or been killed and dropped to the ocean floor, where layers of sediment built up on top of them over many centuries. The pressure of the rock building up in layers over time caused the body of the creature to change and the remains became fossilised and mineralised by the surrounding material.

Enquiry

Carrying out comparative and fair tests

Working scientifically

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Using straightforward scientific evidence to answer questions or to support their findings.

Prior knowledge (what we all ready know)

There are different materials and they are used to make different objects.

Materials can be sorted into groups according to their observable properties.

Different materials are suitable for different uses (properties that can be observed)

The shape of some solid materials can be changed by a contact force acting on them.

Useful vocabulary

sandstone, granite, chalk, limestone, marble, pumice, rough, smooth, hard, soft, rock, stone, pebble, texture, particle, crystal, granule, properties, soil, clay, sandy, loam, peat, organic material, weather, weathering, frost, beach, cliff, trilobite, starfish, sea urchin, ammonite, fossil, fossilise, remains

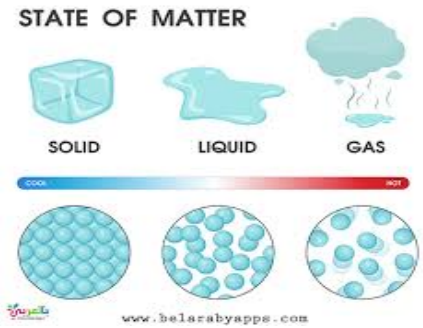
In a state

Key threads

Chemistry	Working scientifically

Whole-school definition of science

Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.



Prior knowledge (what we all ready know)

- Materials can be sorted into groups according to their observable properties
- The shape of some solid materials can be changed by a contact force acting on them

New vocabulary

Solids - retain their shape unless a force is applied to them, for example to cut or shape them.
Liquids - when transferred from place to place take the shape of the container they are in but do not change in volume (although children will learn later in the module that **heating** causes **expansion**).
Gases - change in shape and volume to fill the space they are in. The particles in a gas are wide apart and move freely so, under pressure, the gas will take up less space.
Changes of state - occur as a result of **heating** or **cooling**.
Melting - is the change from solid to liquid caused by heating.
Freezing or **solidifying** - is the change from liquid to solid caused by cooling.
Evaporation - is the change from liquid to gas. In the case of water the gas is called water vapour.
Boiling - is a change from liquid to gas when the liquid is heated to a specific temperature known as its boiling point.
Condensation is the change from gas to liquid at temperatures between its boiling and freezing points.
Water cycle - is the path that all water follows as it moves around Earth in different states.

Enquiry

Grouping and classifying
Setting up simple practical enquiries, comparative and fair tests.

Working scientifically

Observations and explain what they show
Measure changes over time
Classify materials and record their sorting using Venn diagrams

New Knowledge (what we are going to learn)

- Materials can be solids, liquids or gases
- All materials have mass
- Some materials change state when heated or cooled Heating causes melting and evaporation Removing heat causes condensing and solidifying (freezing)
- Liquids and gases expand when they are heated.
- The **water cycle** shows how water in the environment evaporates into the air then the warm air cools as it rises leading to condensation and the formation of clouds. Water droplets in the clouds fall as rain (or as snow or hail if cooled below freezing point). The water returns to the sea via streams, lakes and rivers to continue the cycle.

Useful vocabulary

hard, soft, pour, flow, pile, pool, surface, horizontal, runny, viscous, sticky, grain, powder, ice, water, temperature, cool, cooling, warm, warming, hot, degree Celsius, melt, melting, freeze, freezing, solidify, solidifying, heating, states of matter, change of state, melting point, freezing point, process, air, carbon dioxide, helium, oxygen, bubbles, empty, particle, weight, compress, squash, shape, volume, dry, evaporate, evaporation, water vapour, boil, boiling, boiling point, steam, thermometer, data logger, sensor, droplets, condense, condensation, water, droplets, cycle, model, snow, expand, scale, calibrate, heat sensitive, sensor, observe, measure, fair test, variable, collect, present, interpret, data, axis, scale, interval, control, keep the same, evidence, annotate, accuracy, describe, explain, evaluate, reliable, repeatable

Feel the force

Key threads

Physics	Working scientifically

Whole-school definition of science

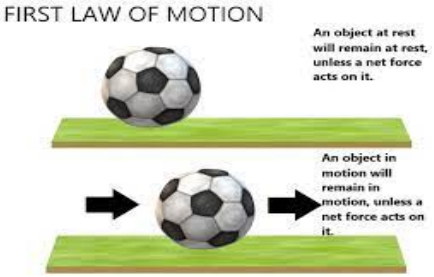
Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.

Enquiry

- Noticing patterns
- plan and carry out fair test

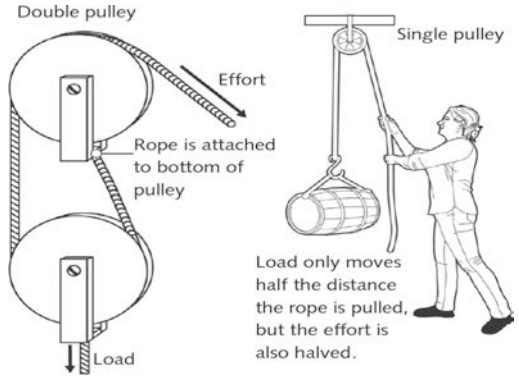
Working scientifically

- pattern-seeking investigations
- observe carefully
- record accurate measurements
- construct different mechanisms.
- Identifying scientific evidence that has been used to support or refute ideas or arguments



Prior knowledge (what we all ready know)

- Pushing and or pulling can make things start moving, stop, go faster or slower
- Some forces need contact between two objects (contact forces)
- Some forces act between objects although they are not in contact (non-contact forces)
- When one object moves over another one there will be a force between them that opposes motion. This is called friction.

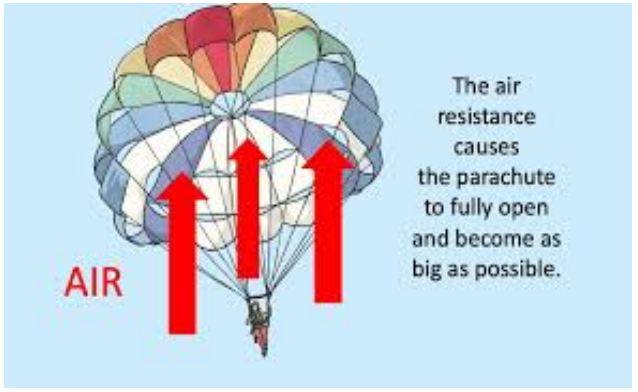


New Knowledge (what we are going to learn)

- Forces are at work on everyday things all the time. Everything that changes speed, stops, starts and changes direction has forces acting on it.
- Forces arise between two objects
- Drag forces resist movement
- The force of gravity caused by the Earth pulls objects towards its center
- Some mechanisms allow a smaller force to have a greater effect
- Newton's first law says that an object will stay still or, if moving, will continue to move at the same speed and in the same direction unless it is acted on by a force.
- Unbalanced forces cause changes to movement (start, stop, speed up, slow down and chanaes of direction).

New vocabulary

Friction - is the force that exists between the surfaces of two objects that are in contact with each other, when at least one of them is moving.
Air resistance - is the force that opposes the movement of objects in air.
Water resistance - occurs when an object moves through water or across the top of water, pushing against it and slowing it down.
Levers, pulleys and **gears** - are simple machines, or mechanisms. They are devices that make things easier to do, whether it is lifting, turning or changing the direction of movement.
Gravity – an invisible force that pulls objects toward each other.
Resistance – an act or instance of opposing.
Upthrust – any force that is causing something to be pushed upwards.



Useful vocabulary

air resistance, Aristotle, balanced, balanced forces, bevel gears, clockwork, cogs, compress, extend, effort, force arm, forces, force, friction, force arrow, fulcrum, gravity, Galileo, gear ratio, gears, gear trains, lever, lift, machine, mechanisms, movement, Newton, Newton meter, pinion, pivot, pulley, pull, push, rack, resistance, rotary motion, simple machines, speed, time, unbalanced force, upthrust, water resistance, weight arm, wheel

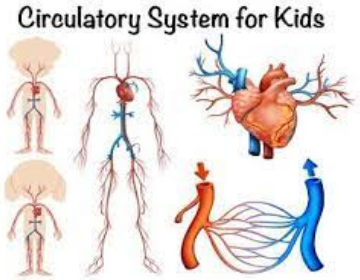
Body Pump

Key threads

Biology	Working scientifically

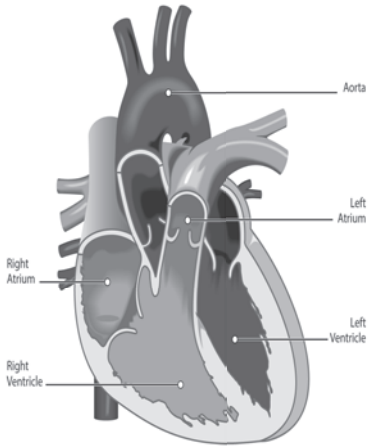
Whole-school definition of science

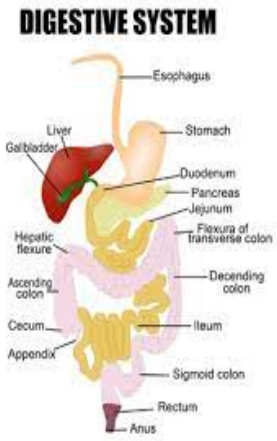
Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.



Prior knowledge (what we all ready know)

- Humans and other animals need water, food and air in order to survive.
- Food is broken down further in the stomach and intestine and absorbed into the blood stream with water





New vocabulary

artery: one of the branching tubes that carry blood from the heart to all parts of the body.
capillaries: one of the slender hairlike tubes that are the smallest blood vessels and connect arteries with veins.
valve: a structure in the body that temporarily closes to prevent passage of material or allow movement of a fluid in one direction only a heart valve
vein: one of the blood vessels that carry the blood back to the heart.
circulatory system: is made up of blood vessels that carry blood away from and towards the heart
digestive system: the system of the body that takes in, breaks down, and absorbs food and discharges solid waste and consists of the digestive tract and related glands
plasma: A relatively clear, yellow-tinted water containing sugar, fat, protein and salt solution, which carries the red cells, white cells, and platelets.
platelets: Cell fragments that work with blood clotting chemicals at the site of wounds by sticking to the walls of blood vessels, thereby plugging the gap.
red blood cells: Relatively large microscopic cells that normally make up 40-50% of the total blood volume. They transport oxygen from the lungs to the body's living tissues and carry away carbon dioxide.
white blood cells: There are different types of white blood cells that exist in variable numbers but that collectively make up a very small part of blood's

Enquiry

- use secondary sources of information

Working scientifically

- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, and bar and line graphs
- Reporting and presenting findings from enquiries.

New Knowledge (what we are going to learn)

- Human circulatory system enables our bodies to function.
- The main parts of the circulatory system: the heart, blood vessels (arteries, veins and capillaries) and blood. They work together to deliver oxygen and nutrients to every part of the body.
- Oxygen is taken into the blood in the lungs; the blood is pumped by the heart to take oxygen and nutrients to the muscles
- Some substances and lifestyle choices can have a negative impact on health

Useful vocabulary

aorta, artery, atrium, blood, blood vessel, body temperature, capillaries, carbon dioxide, cells, chamber, chest cavity, circulation, circulatory system, deoxygenated blood, digestive system, digestive tract, health, heart, heart valves, humans, hydration, lubricant, lungs, muscular system, nutrients, nutrition, oxygen, oxygenated blood, plasma, platelets, pump, red blood cell, skeletal, system, transport, valve, vein, vena cava, ventricle, vessel, waste, waste gases, white blood cells