



Year 1 Science Knowledge Organiser

Animals including Humans

What I should already know?



Knowledge:

- I can identify different parts of their body.
- I have some understanding of healthy food and the need for variety in my diet.
- I am able to show care and concern for living things.
- I know the effects exercise has on my body.
- I have some understanding of growth and change. I can talk about things I have observed including animals

Skills:

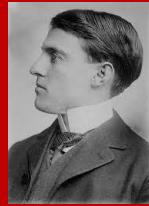
- I can ask simple questions
- I can observe and measure growth.
- I can suggest ways to find answers to questions.

New Learning



- To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals,
- To identify and name a variety of common animals that are carnivores, herbivores and omnivores.
- To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).
- To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Famous in this field








Miller Reese Hutchinson
(1876 - 1944)

Was an American engineer and inventor he invented the first electric hearing aid in 1898.



Key Vocabulary



Vocabulary	Definition
 Skeleton	The human skeleton is made of bones and grows as we grow.
 Muscle	A muscle is a piece of tissue inside your body that connects two bones and which you use when you make a movement.
 Hearing	The sense of being able to detect sound.
 Taste	Taste is the ability to detect the flavour of food, minerals and various chemicals.
 Sight	Sight is the power of seeing.

Sticky Knowledge



Mammals

- Have hair or fur
- Give birth to live young
- Mammal mothers nurse their young with milk
- Have lungs and need air to breathe
- Warm blooded



Amphibians

- Live on land and water
- Webbed feet
- Breathe with lungs and gills
- Cold blooded
- Moist smooth skin (no hair or fur)
- Lay many eggs



Reptiles

- Have scales not fur
- Have dry skin
- Usually lays eggs sometimes live young
- Ear holes instead of ears
- 4 legs or no legs
- Cold blooded



Bird

- Have feathers and wings
- Lay eggs
- Have 2 legs
- Warm blooded
- Have ear holes instead of ears



Fish

- Breathe underwater using gills not lungs
- Live in water
- Have scales and fins (no hair or fur)
- Cold blooded
- Lay many eggs





Year 1 Science Knowledge Organiser

Seasonal Changes

What I should already know?



Knowledge:

- I can talk about some of the things I have observed such as plants, animals, natural and found objects.' in Reception,
- I have an understanding of growth, decay and changes over time.
- I can show care and concern for living things and the environment.

Skills:

- Asking simple questions
- Observing plants and talking about changes
- Recognising the differences between the parts of a plant.

Famous in this field



Greta Thunberg - Greta Thunberg is a Swedish activist who works to address the problem of climate change. She is the founder of a movement known as Fridays for Future..






Key Vocabulary



New Learning



- To make observations of all four seasons
- To name all four seasons
- To describe to key features of the four seasons
- To observe and describe weather associated with the seasons
- To talk about how the day length changes in each season

Vocabulary	Definition
 Daylight	The time after sunrise and before sunset while it is light outside.
 Spring	The season after winter, the plants start to come back to life and the weather is warmer.
 Summer	The season after Spring, the days are longer and the weather is hot.
 Autumn	The season after Summer, the weather is cooler and the leaves start to change colour.
 Winter	The season after Autumn, the weather is cold, sometimes it snows.

Sticky Knowledge



There are four seasons, Spring, Summer, Autumn and Winter.

The weather changes in each season. The changes in each season can be seen when looking at plants and trees.

Temperature is the amount of heat in something. The temperature changes in each season.

In the Summer daylight hours are longer than in the winter.





Year 2 Science Knowledge Organiser

Animals including Humans

What I should already know?



Knowledge:

- I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.
- I can identify and name a variety of common animals that are carnivores, herbivores and omnivores.

Skills:

- I can ask simple questions and recognise that they can be answered in different ways.
- I can observe closely, using simple equipment
- I can perform simple tests.
- I can use observations and ideas to suggest answers to questions.

New Learning



- To notice that animals, including humans, have offspring which grow into adults.
- To find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Famous in this field



Florence Nightingale (1820 - 1910)

Her most significant innovation was a diagram which showed the causes of soldiers' deaths over two successive years. Florence Nightingale is a famous British nurse who lived from 1820-1910. She helped to make hospitals more sanitary places and wrote books about how to be a good nurse.

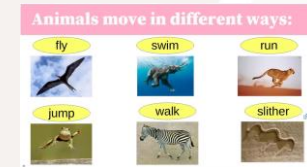
Key Vocabulary



Vocabulary	Definition
 Healthy	To be healthy is doing things that are good for your body. Eating a varied diet, exercising and getting rest.
 Offspring	A person's child or children or an animal's young.
 Reproduce	To produce offspring.
 Species	A type of animal or plant. The Giant Panda is now an endangered species.
 Exercise	Exercise is a way of keeping the body healthy by being active.

Sticky Knowledge

Animals move in order to survive. Different animals move in different ways to help them survive.



Exercise keeps animal's bodies in good condition and increases survival chances.

All animals reproduce. This means they have offspring. e.g. Humans have babies.



For example all mammals give birth to live young, whilst fish lay eggs.

All these must receive the basic needs in order to survive and reach adult hood, such as water, food, shelter and oxygen.

When they are fully grown they can reproduce and the life cycle goes on.





What I should already know?



Knowledge:

- I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- I can find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Skills:

- I can ask relevant questions and using different types of scientific enquiries to answer them
- I can setting up simple practical enquiries, comparative and fair tests.

New Learning



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

Famous in this field



**Mary Anning
(1799 - 1847)**

Mary was an English fossil collector, dealer, and palaeontologist who became known around the world for the discoveries she made in Jurassic marine fossil beds in the cliffs along the English Channel.



Key Vocabulary



Vocabulary	Definition
Igneous	Igneous rocks are formed from melted rock deep inside the Earth.
Sedimentary	Sedimentary rocks are formed from layers of sand, silt, dead plants, and animal skeletons.
Metamorphic	Metamorphic rocks formed from other rocks that are changed by heat and pressure underground.
Fossil	The remains or impression of a prehistoric plant or animal embedded in rock and preserved in petrified form.
Permeable	A material which allows water or liquids to flow through.
Impermeable	Something that will not allow fluid to pass through it.

Sticky Knowledge

There are different types of rock.



There are different types of soil. Soils change over time. Different plants grow in different soils.



A fossil is any preserved remains, impression, or trace of any once-living thing from a past geological age. Fossils tell us what has happened before. Fossils provide evidence.



Palaeontologists use Fossils to find out about the past. Fossils provide evidence that living things have changed over time.



Year 3 Science Knowledge Organiser

Animals including Humans

What I should already know?



Knowledge:

- I know that animals, including humans, have offspring which grow into adults.
- I know the basic stages in a life cycle for animals, including humans.
- I can find out and describe the basic needs of animals, including humans, for survival (water, food and air).
- I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Skills:

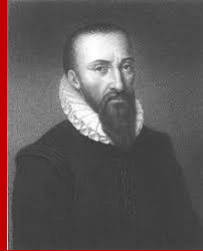
- I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

New Learning



- To 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.
- To identify that humans and some other animals have skeletons and muscles for support, protection and movement

Famous in this field










Dr Ambroise Paré
(1510 - 1590)

In the early sixteenth century, doctor Ambroise Paré made significant advances in both amputation surgery, and the development of prosthetic limbs. He was the first to introduce a hinged prosthetic hand, and a leg with a locking knee joint.

Key Vocabulary



Vocabulary	Definition
 Muscle	A muscle is a piece of tissue inside your body that connects two bones and which you use when you make a movement.
 Tendons	Cords that join muscles to the bone.
 Joints	A structure in the human or animal body at which two parts of the skeleton are fitted together.
 Vertebrate	Animals with back bones.
 Invertebrate	Animals without backbones.
 Saturated Fats	Types of fats that are considered unhealthy and should only be eaten in small amounts.
 Unsaturated Fats	Fats that give you energy, minerals and vitamins.

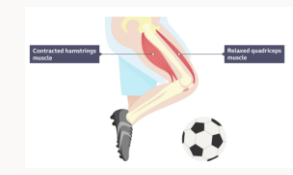
Sticky Knowledge

- Living things need food to grow and to be **healthy** and **strong**.
- Plants can make their own food but animals can not.
- To stay healthy animals need to **exercise**, eat a **healthy diet** and be **hygienic**.
- Animals including humans need food, water and air to stay alive.

Skeletons do 3 Important Jobs:

1. Protect organs inside the body
2. Allow movement
3. Support the body and stop the body from falling to the floor.

Skeletal muscles work in pairs to move the bones that they are attached to by taking it in turns to contract (get shorter) and relax (get longer).



Interesting Fact!

The human skeleton is the internal framework of the human body. It is composed of around 270 bones at birth - this total decreases to around 206 bones by adulthood after some bones get fused together.



Year 4 Science Knowledge Organiser

Living Things and their Habitats

What I should already know?



Knowledge:

- I can explore and compare the difference between things that are living, dead and things that have never been alive.
- I can identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.
- I can identify and name a variety of plants and animals in their habitats, including micro habitats.
- I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.

Skills:

- I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

New Learning



- To recognise that living things can be grouped in a variety of ways.
- To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
- To recognise that environments can change and that this can sometimes pose dangers to living things.

Famous in this field



Greta Tintin Eleonora Ernman Thunberg is a Swedish environmental activist who is known for challenging world leaders to take immediate action for climate change mitigation. Thunberg's activism began when she persuaded her parents to adopt lifestyle choices that reduced their own carbon footprint

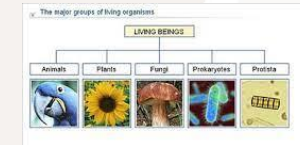
Key Vocabulary



Vocabulary	Definition
Movement	An act of moving.
Climate	The weather conditions prevailing in an area in general or over a long period.
Characteristic	Typical of a particular person, place, or thing.
Deforestation	The action of clearing a wide area of trees.
Pollution	The presence in or introduction into the environment of a substance which has harmful or poisonous effects.
Environment	The measure of the force of gravity on an object.
Contamination	The action or state of making or being made impure by polluting or poisoning.

Sticky Knowledge

Living things can be divided into groups based upon their characteristics.



Environmental change affects different habitats differently.



Different organisms are affected differently by environmental change. Human activity significantly affects the environment.



Different food chains occur in different habitats.





Year 4 Science Knowledge Organiser

States of Matter

What I should already know?



Knowledge:

- I can distinguish between an object and the material from which it is made.
- I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- I can describe the simple physical properties of a variety of everyday materials.
- I can compare and group together a variety of everyday materials based on their simple physical properties.
- I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. .

Skills:

- I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- I can identify scientific evidence that has been used to support or refute ideas or arguments.

New Learning



- To compare and group materials together, according to whether they are solids, liquids or gases.
- To observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius ($^{\circ}\text{C}$).
- To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Famous in this field



Daniel Gabriel Fahrenheit FRS was a physicist, inventor, and scientific instrument maker. He is famous for inventing two things. One invention was a temperature scale, which later became known as the Fahrenheit scale. In this scale, the freezing point of water is 32 degrees Fahrenheit (32°F) and the boiling point is 212°F . Fahrenheit's other invention was a thermometer that used mercury.

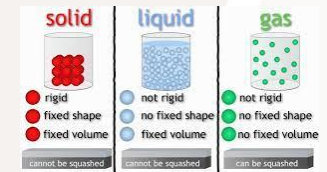
Key Vocabulary



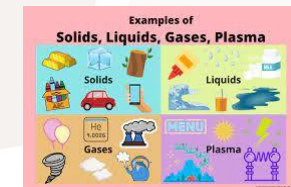
Vocabulary	Definition
Temperature	Temperature is the measure of the warmth or coldness of an object or material. Temperature is the expression of thermal energy.
Precipitation	Any liquid or frozen water that forms in the atmosphere and falls back to the Earth.
Evaporation	The process of turning from liquid into vapour.
Condensation	Water which collects as droplets on a cold surface when humid air is in contact with it.

Sticky Knowledge

Solids, liquids and gases are described by observable properties.



Materials can be divided into solids, liquids and gases.



Heating causes solids to melt into liquids and liquids evaporate into gases.



Cooling causes gases to condense into liquids and liquids to freeze into solids.



The temperature at which given substances change state are always the same.



Year 5 Science Knowledge Organiser

Properties and Changes in Materials

What I should already know?



Knowledge:

- I can distinguish between an object and the material from which it is made.
- I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- I can describe the simple physical properties of a variety of everyday materials.
- I can compare and group together a variety of everyday materials based on their simple physical properties.
- I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Skills:

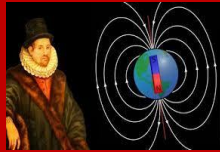
- I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- I can identify scientific evidence that has been used to support or refute ideas or arguments.

New Learning



- To compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
- To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.


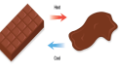

Famous in this field



William Gilbert made the first magnet in 1600. A forceful advocate of the power of the scientific experiment, Gilbert discovered that our planet has two magnetic poles; he defined these poles correctly and established that the earth behaves like a giant magnet.

Key Vocabulary

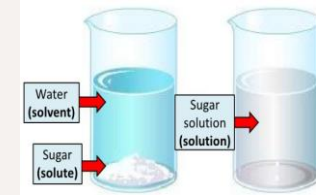


Vocabulary	Definition
Soluble	Can be dissolved in a liquid.
Conductivity	The property of allowing heat or electricity to pass through something.
 Filtration	Is the process of separating solid particles from a liquid by passing through a filter.
 Reversible	A reversible change is a change that can be undone or reversed . Such as the freezing of water into ice - it can be melted to become water again.
 Irreversible	Irreversible change is a change that can't be undone. Such as cooking, baking, frying and burning materials. For example, you can fry a raw egg to cook it. You can't return it back to a raw egg again.

Sticky Knowledge

Solutions and Separation

A solution is a specific type of mixture where one substance is dissolved into another.



-A solvent is a substance that dissolves a solid, liquid, or gaseous solute.

-A solute is the substance dissolved in the solvent. When it dissolves, it looks as though it has disappeared, but in fact it has been broken down to become a part of the liquid.

-One example of a solution is salt water. You cannot see the salt, and the solution will remain if left alone.

-Some mixtures and solutions can be separated, e.g. through processes such as sieving, filtering & evaporating. Salt and water can be separated by evaporation.

Reversible Changes



- Melting
- Boiling,
- Evaporation,
- Freezing,
- Condensation,
- Dissolution

Irreversible Changes



- Burning
- Rusting
- Decaying



Year 5 Science Knowledge Organiser

Animals including Humans

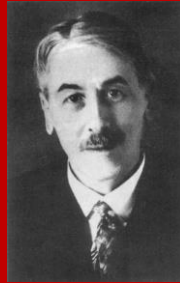
What I should already know?



Knowledge:

- I have an understanding of growth, decay and changes over time.
- I can talk in simple terms about how animals grow & reproduce.
- I can 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.
- **Skills:**
- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.



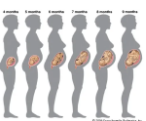
Famous in this field



Franz Baron Nopcsa- was a self-taught palaeontologist who spent his life pushing the boundaries of scientific understanding concerned with the growth of animals

Key Vocabulary



Vocabulary	Definition
 Sexual Reproduction	Sexual reproduction is a form of reproduction in which genetic material from two individuals of opposite sexes mixes to create offspring.
 Puberty	' Puberty is the time when a boy or girl's body begins to develop and change as they become an adult.
 Gestation	Gestation is the period of development where some animals carry their babies inside their bodies before they give birth.

Sticky Knowledge

Human life cycle

There are six stages in the human life cycle:

- 1. Foetus**
At this time, a baby is growing inside its mum's womb.
- 2. Baby**
A baby is born after spending nine months inside the womb.
- 3. Childhood**
At this stage, you learn to walk and talk.
- 4. Adolescence**
Children become teenagers.
- 5. Adulthood**
Your body is fully developed.
- 6. Old age**
The last stage in the life cycle of a human.

During puberty boys and girls bodies change, this is due to the changes in hormone levels. Some of the changes include growing pubic hair, girls begin to develop breasts and boys voices become deeper.

New Learning



- To describe the changes that take place as humans develop from birth to old age.
- To understand about the changes that take place during puberty.
- To have the knowledge needed to draw a timeline to indicate stages in the growth and development of humans.



What I should already know?



Knowledge:

I can recognise that they need light in order to see things and that dark is the absence of light.
I can notice that light is reflected from surfaces. I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes.
I can recognise that shadows are formed when the light from a light source is blocked by a solid object.

- I can find patterns in the way that the sizes of shadows change.

Skills:

- I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- I can identify scientific evidence that has been used to support or refute ideas or arguments.

New Learning



- To recognise that light appears to travel in straight lines.
- To use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- To explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them




Famous in this field



Edme Hippolyte Marié-Davy was a French chemist and inventor during the 19th century. He was born in Clamecy, Nièvre. In 1854, he invented the first naval periscope, consisting in a vertical tube with two small mirrors fixed at each end at 45°.

Key Vocabulary



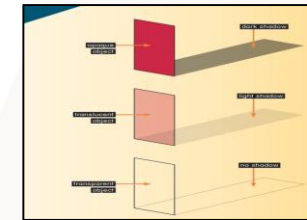
Vocabulary	Definition
Translucent	Materials that let light through but it is randomly scattered.
Transparent	These are materials which let all of the light straight through.
Opaque	These materials let no light through.
Reflective	When light from an object is reflected by a surface, it changes direction. It bounces off the surface at the same angle as it hits it.
 Concave	Describes a shape that curves inwards.
 Convex	It means it curves outwards like the surface of a sphere.
 Refraction	The bending of light rays. Refraction is the change in the speed of a wavelength while it passes through a material. Commonly seen with light and transparent objects, such as glass or water. The change in speed causes the waves to change direction, affecting the way that we see things!

Sticky Knowledge

How light travels

Light originates from light sources.

- Light sources can be natural (e.g. The Sun, the stars) or man-made (e.g. street lamp, Christmas tree lights, glow stick, mobile phone, TV).
- Light travels in a straight line from light sources.
- We can see that light travels in straight lines when we shine a torch in a dark room, or when a ray of light comes through a window.
- When an object passes in front of a ray of light, the light can be blocked, creating a shadow.
- Opaque objects let no light through (creating the darkest shadows), translucent objects let some light through (creating fainter shadows), transparent objects let all light through (no shadow)



Our Eyes

Our eyes have a small window at the front called a pupil, through which light can enter. The pupil looks as though it is black because it is dark inside our eyes.

When it is dark, our pupils go larger, in order to let more light in so that we can see better. In bright lights, our pupils go smaller.

-At the back of our eye is a sensitive sheet of nerves called a retina. They can detect light when it comes in through the pupil, and send messages to the brain about what we can see.





Year 6 Science Knowledge Organiser

Electricity

What I should already know?



Knowledge:

- I can identify common appliances that run on electricity.
- I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
- I can identify whether a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery.
- I can recognise that a switch opens and closes the circuit and associate this with whether a lamp lights in a simple series circuit.
- I can recognise some common conductors and insulators, and associate metals with being good conductors.
- I know the difference between a conductor and an insulator, giving examples of each.
- I can work safely when using electricity.

Skills:

- I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- I can identify scientific evidence that has been used to support or refute ideas or arguments.

New Learning

- To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- To compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- To use recognised symbols when representing a simple circuit in a diagram

Famous in this field



Thomas Alva Edison was an American inventor and businessman. He developed many devices in fields such as electric power generation, mass communication, sound recording, and motion pictures.



Key Vocabulary



Vocabulary	Definition
Appliances	A device or piece of equipment designed to perform a specific task.
Component	A part or element of a larger whole, especially a part of a machine or vehicle.
Renewable	Renewable resources can naturally replenish themselves. biomass energy (such as ethanol), hydropower, geothermal power, wind energy, and solar energy
Non-renewable	Non-renewable resources cannot replenish themselves. Oil, natural gas, coal, and nuclear energy.

Sticky Knowledge

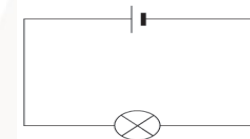
Variation of components

When changes are made to circuits, components can function differently:

-When switches are open or wires are removed from a circuit (so that it is no longer a closed circuit), bulbs and buzzers will turn off. You can use crocodile clips to investigate adding and removing wires.

-When more batteries or cells are added (or batteries or cells are included with a higher voltage) the brightness of bulbs and the volume of buzzers will increase.

-When more bulbs are added to a simple circuit, they will be dimmer than if there were one bulb. This is because the electricity is shared between the two bulbs. More voltage would be needed to make them brighter.



Circuit symbols for components

