Year One

ANIMALS including Humans KNOWLEDGE ORGANISER

Key Vocabulary	
sight	Your eyes let you see all the things around you.
hearing	Your ears let you listen to all the things around you. Your brain is able to tell what different sounds are.
touch	Your skin gives you the sense of touch. You can tell if something is warm, cold, smooth or rough without even looking at it!
taste	Your sense of taste comes from your tongue. You can tell if something tastes bitter or sweet. You might have some tastes you like and some you don't.
smell	You smell using your nose. Your nose can tell if things smell nice or not nice.

Senses

sight

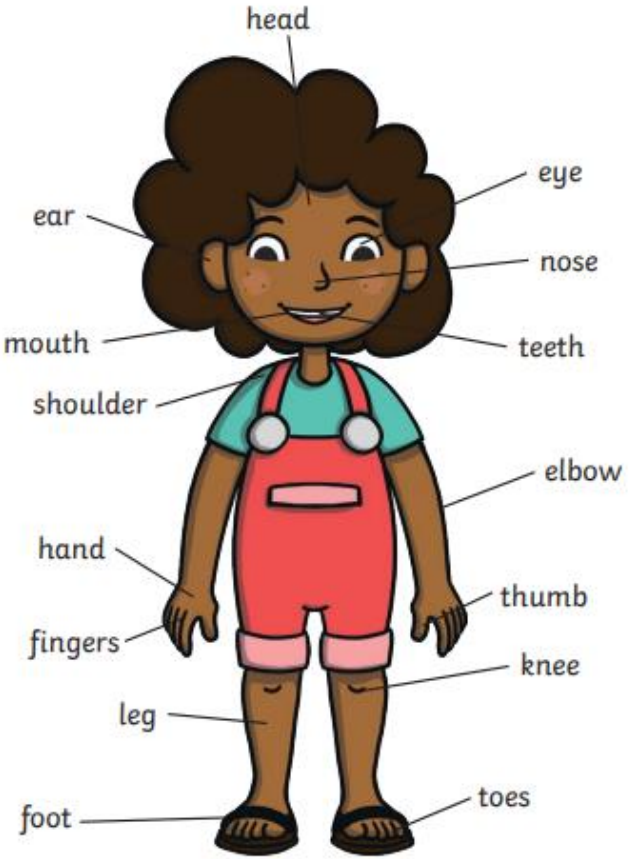
hearing

touch

taste

smell

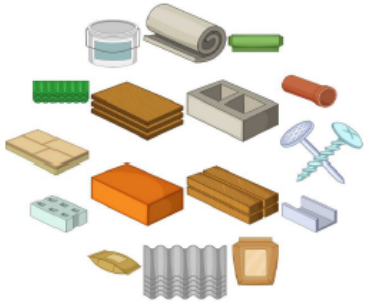
Parts of the Body



Year Two

Use of EVERYDAY MATERIALS KNOWLEDGE ORGANISER

What you should already know...



-Materials are the substances that things are made from.

-We use lots of different materials every day, e.g. metal, plastic, wood, and glass.

-Different materials have certain properties, e.g. glass is see-through, metal is strong and often shiny, etc.

-Composites are made from two or more materials together.

- Some materials are used to make many things.

Development of Materials

John Dunlop

-John Dunlop is famous for developing the pneumatic (air-filled) tyre.
-He did this, at first, to improve the tyres on his son's bicycle!
-He used his understanding of rubber to fit it to a wooden disc. He then used an inflated tube of sheet rubber to blow up the tyre.

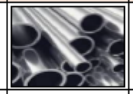
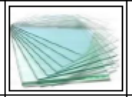
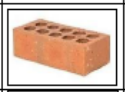
Charles Macintosh

-Charles Macintosh is best known for inventing the raincoat.
-He discovered a way in which rubber could be placed between two layers of cloth, to make it waterproof.
-His name lives on today – a raincoat is often called a Macintosh or Mac.

John McAdam

-John McAdam was the first person to think of tarmac roads.
-Roads used to be made from clay, earth, or chalk, but these materials were messy and not very smooth.
-He spread hot tarmac on a road, adding lime chippings & flattening.

Properties of Materials

Material	Image	Properties	What could it be used for?
Metal		-Metals are often strong, shiny, hard and long-lasting. -Metals can be hammered into different shapes.	-Metals can be made into things like pots and pans. -Metals can stretched into wires and rods.
Glass		-Glass can be strong, but thin glass shatters. -Glass is transparent and waterproof. It can be made into different shapes.	-Glass is most often used to make windows and glasses. -It is also used in making mirrors, table-tops and windscreens.
Wood		-Wood is hard and strong; -Wood is long-lasting and is a natural product. -Wood is flammable.	-Wood is often used to build furniture, like benches and desks. -Wood can be used to build houses and cabins.
Plastic		-Plastics can be tough or flexible and can be made into any shape. Plastics can be dyed different colours and can be made transparent.	-Plastics can be used to make packaging, bottles and toys. -Plastics can be moulded into plates, knives and forks.
Rubber		-Rubber is extremely tough, but also very flexible. -Rubber is elastic and also waterproof. Rubber doesn't tear easily.	-Not including food and drinks, water is still used in many, many products. For example, it is used in making paints, toothpastes, shampoos and cement.
Brick		-Bricks are very hard and strong. They are difficult to break. Bricks are thick and store heat well.	-Bricks are normally attached together with mortar and are used to make buildings. -They are also used for paving.
Paper		-Paper is often thin and can be made into lots of different shapes. Paper can be torn. It goes soggy when wet.	-Paper is normally used for writing. Paper is used in diaries, notebooks and for printing on. Paper is used for posters/displays.
Cardboard		-Cardboard is often thin but is firmer and tougher than paper. Cardboard is more difficult to tear. It goes soggy when wet.	-Cardboard is often turned into boxes and is then used for packaging items. It can be used for protection, e.g. protecting floors when painting.

Properties of Materials Vocabulary

Hard | Squashy | Smooth | Absorbent | Bumpy | Bouncy | Dull | Flexible | Flammable | Translucent | Waterproof | Firm | Soft

Year Three

ANIMALS including Humans KNOWLEDGE ORGANISER

Y3

What you should already know...

-Animals can be split into different groups (e.g. birds/fish & carnivores/omnivores)

-All animals have basic needs that have to be met in order for them to survive: water, food, shelter, oxygen, temperature

-Animals have different stages in their lives – birth, growth, reproduction and death.

-Humans (and most other animals) need to stay healthy, by exercising, eating a balanced diet, and being hygienic.

Nourishment

-Unlike plants, animals cannot create their own food. They get nutrition from what they eat.

-This is because animals do not have chlorophyll, or chloroplasts in their cells, like plants do.

-Therefore, plants are called producers and animals are called consumers.

-The different nutrients that animals get depends on their diet. For example, a cheetah gets lots of protein in its diet because it is a carnivore (eats meat).

Types of Nutrition

Carbohydrates

-Carbohydrates give the consumer energy.

-Foods that have lots of carbohydrates in are often called 'starchy' foods.

-Carbohydrate-rich foods include pasta, rice, oats, breads, breakfast cereals and barley.

Protein

-Protein helps the body (especially the muscles) to repair itself.

-Protein-rich foods include meat, eggs & nuts.

Fat

-Fats also give consumers lots of energy. However, too much fat is not healthy!

-Butter, cakes & fast food contain lots of fat.

Fibre

-Fibre helps our digestive systems to work well.

-Fibre is often found in high-carboydrate foods like bread, cereal, potatoes, and some fruits.

Vitamins and Minerals

-There are many different vitamins and minerals that perform hundreds of roles in the body.

Fruit and vegetables are vitamin/mineral-rich.

Skeletons and Muscles

Skeleton

-Humans (and many other animals) have a system of bones called a skeleton.

-Skeletons help to support your body – they give it its shape.

-Skeletons are also important for movement. Muscles are attached to bones.

-Finally, skeletons help to protect important parts of the body. E.g. the ribs protect the heart and lungs.

Muscular System

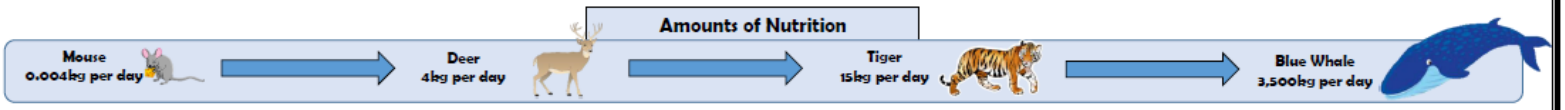
-Humans (and many other animals) also have a system of muscles in their bodies.

-The main purpose of muscles is for movement. As they contract, muscles move parts of the body around.

-Muscles are also important for maintaining posture, helping humans/ animals to sit, stand, and walk.

-Some muscles (e.g. the heart) move by themselves – they are involuntary.

Amounts of Nutrition



Year Four

Year Four will be focussing on the skills of working scientifically this term rather than a set topic in science.

The skills they are focussing on can be found in the Working Scientifically document.

Year Five

LIVING THINGS and their habitats KNOWLEDGE ORGANISER

Vs

What you should already know...

-There are seven common features of living things – Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion & Nutrition.

-Animals can be grouped into vertebrates (have backbone) and invertebrates (have no backbone). They can be grouped into further categories, e.g. mammals, reptiles, birds, etc.

-Plants can also be categorised in many different ways, e.g. flowering and non-flowering plants.

-Animals are often adapted to the habitats they live in. Both natural and man-made events can change habitats over time, placing animals in danger.

Naturalists and Animal Behaviourists

Naturalists

A natural scientist, or naturalist, studies animals and plants by observation, rather than by experimenting.

One example of a naturalist is Sir David Attenborough, who is known for presenting information and findings about animals through innovative and engaging television programmes.

Other naturalists include:
-Charles Darwin
-Alfred Russel Wallace
-Steve Irwin

Animal Behaviourists

Animals behaviourists make scientific studies of everything that animals do, from observations to experimentation.

One example of an animal behaviourist is Dr Jane Goodall, who is best known for her 55-year study of the behaviour of chimpanzees. She is the founder of a conservation institute.

Others include:
-Karl von Frisch
-Konrad Lorenz
-Nikolaas Tinbergen.

Animal Life Cycles

A life cycle is the series of changes that an animal goes through in its life, including reproduction.

Mammals

-Mammals have a 3-stage life cycle:

-Stage 1: The gestation period - the embryo grows inside the mother & is dependent on her.

-Stage 2: The young mammal grows and develops independence.

-Stage 3: Adult mates in order to reproduce.

Amphibians

-Many amphibians have a 5-stage life cycle:

-Stage 1: Female lays eggs, fertilized by the male.

-Stage 2:Tadpole breathes in water through gills.

-Stage 3: Grows fins and develops lungs.

-Stage 4: Tadpole grows front legs. Jumps from water onto land.

-Stage 5: Starts to eat insects/plants. Takes 2-4 years to become adult.

Insects

-Most insects undergo metamorphosis and have a life cycle of 4 stages:

-Stage 1: Eggs laid by female insect.

-Stage 2: Eggs hatch into larva, e.g. caterpillars, maggots, grubs.

-Stage 4: The pupa (hard coating) is formed. Inside this, the larva transforms.

-Stage 5: The adult breaks out of the pupa and matures.

Birds

-Birds have a 3-stage life cycle:

-Stage 1: Eggs laid by the mother. Parents care for the egg until hatching.

-Stage 2: Mother and father feed the bird until it is independent.

-Stage 3: Adult mates in order to reproduce.

Plant Life Cycles

Plants are able to reproduce in two ways – sexual reproduction and asexual reproduction.

Sexual reproduction in plants is cyclical, following this process:

1.Germination -The plant begins to grow from a seed. Roots form under the soil and a stem, leaves and flower shoots above the surface.

2.Pollination – Pollen produced by the flower is carried by insects or blown by the wind to another flower.

3.Fertilisation – The pollen reaches another flower and makes its way to the ovary, where it is fertilised.

4.Dispersal – The seeds are scattered by animals or the wind.

Asexual reproduction involves plants producing an identical copy of themselves.

This can happen in a number of different ways. Some plants are able to produce bulbs (e.g. daffodils and snowdrops). Others, like potatoes produce tubers. Tubers lie below the soil, and grow into plants the next year.

Human Life Cycle

Embryo → Baby → Childhood → Adulthood – can reproduce → Embryo

Year Six

LIVING THINGS and their habitats KNOWLEDGE ORGANISER

Y6

What you should already know...

-Animals and plants can be classified into different groups based on their characteristics.

-Animals can be grouped into vertebrates (with a backbone) and invertebrates (without a backbone).

-They can then be subdivided into further groups, for example mammals, fish, reptiles etc. (vertebrates) or spiders, snails, worms etc. (invertebrates).

-Plants are commonly grouped into flowering plants and non-flowering plants. They too can be sub-divided beyond these broad classifications.

Linnaeus Classification

Carl Linnaeus

Carl Linnaeus was a Swedish scientist, botanist and zoologist who is known as the 'father of taxonomy.'

He created something called the binomial nomenclature, which was a way of classifying plants and animals (taxonomy).

He classified man among the primates, which brought him criticism at the time!

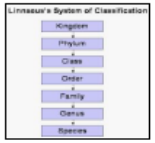
He was made a noble by the Swedish King. He lived from 1707-1778. Parts of his system are still used today.

Classification System

Linnaeus gave each organism a two part Latin scientific name, based on their genus and species. A genus is a group made up of several species.

For example, the genus 'Pan' is made up of the chimpanzee (pan troglodytes) and the bonobo (pan paniscus).

His scientific process involved observing, recording the information and making conclusions.



Classification of Animals

M-R-S G-R-E-N

You can remember the seven features of living things by using the acronym MRS GREN (Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition.

Mammals -Mammals are warm-blooded. -They often have hair/fur on their bodies. -Mammals give birth to live young. -Mammals often drink milk from their mothers.	Bears, Lions, Dogs, Cats, Rabbits, Squirrels, Whales, Monkeys, Horses, Cows, Pigs, Sheep, Tigers, Humans.	**Snails** -Snails have shells. -They have a large muscular foot, which secretes mucus. -Their stomach is directly above their muscular foot. -Most snails live underwater.	Garden Snail, Scutalus, Giant African Land Snail.
Reptiles -Reptiles are cold-blooded. -They normally lay eggs (but some don't). -Reptiles have scales or scutes.	Crocodiles, Lizards, Turtles, Chameleons, Snakes, Geckos, Iguanas, Dinosaurs.	**Slugs** -Slugs do not have shells. -They have a large muscular foot, which secretes mucus. -Their stomach is directly above their muscular foot.	Leopard Slug, Black Slug, Yellow Slug.
Amphibians -Amphibians are cold-blooded animals. -They have moist, scaleless skin. It is often permeable. -Amphibians lay eggs.	Frogs, Salamanders, Toads, Newts, Tadpole.	**Worms** -Worms have long, narrow bodies. -Worms do not have limbs (arms and legs). -They are bilaterally symmetrical (both sides the same).	Flatworms, Round Worms, Segmented Worms
Fish -Fish are cold-blooded animals. -Fish can breathe underwater, using gills. -Fish lay eggs. -Fins help to propel fish through the water.	Sharks, Goldfish, Carp, Swordfish, Stingray, Clownfish, Pike, Salmon, Bass, Haddock, Tuna, Cod, Eel, Turbot.	**Spiders** -Spiders have eight legs. -Spiders bodies are made of two main parts. -Spiders create silk from their spinneret glands. -Spiders lay eggs.	Tarantula, Wolf Spider, Huntsman Spider, Widow Spider.
Birds -Birds are warm-blooded. -Birds have feathers, wings and a beak. -Birds lay eggs.	Parrot, Owl, Eel, Flamingo, Penguin, Puffin, Chicken, Toucan, Blackbird, Sparrow, Pigeon.	**Insects** -Insects have exoskeletons: hard shell-like coverings of their body. They also have three main body parts. -They have antennae on the top of their heads.	Beetle, Ant, Fly, Flea, Butterfly, Mosquito, Bee, Cricket.

Classification in Local Habitats

Garden

Vertebrates: Mammals = cats, dogs, rabbits, foxes. Birds = sparrow, robin, crow. Amphibians = frogs, toads.

Invertebrates: Insects = bee, wasp, fly, Spiders, Worms = earthworm, Snails = garden snail, Crustaceans = woodlouse.

Seaside

Vertebrates: Mammals = Beach mice, Birds = seagulls, pigeons, Reptiles = sea turtles, Fish = cod, haddock.

Invertebrates: Crustaceans = crabs, lobsters, prawns, Echinoderms = starfish, sea cucumbers, sea urchins.

Forest

Vertebrates: Mammals = badger, deer, squirrel, boar, pine marten. Birds = woodpecker, owl, warbler. Reptiles: adder, lizard, slowworm.

Invertebrates: Spiders: harvestman, woodlouse spider, Insects: Ants, crickets, grasshoppers.

Human Classification – from vague to specific

Kingdom: Animals → Phylum: Chordates → Class: Mammals → Order: Primates → Family: Hominids → Genus: Homo → Species: Homo Sapiens