Hanslope Primary School
Science Knowledge Organiser

Year One/Two – Materials (Indoor focus)

How does this link to my previous learning?

- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter
- I can talk about things in my own environment and know how these might be different from one another

National Curriculum Links:

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties

How does this link to my future learning?

- States of matter (Year 4)
- Properties and change of materials (Year 5)

What key vocabulary will I learn:

- **Stretch**- to make something longer without ripping
- **Bend**-to force something to curve
- **Twist**- to force or bend something out of shape
- **Squash**- to crush or squeeze something
- **Suitability**- being right for a purpose
- **Man made materials** – materials that have been made by humans
- **Natural materials** -materials that come from plants, animals or the earth
- **Object** – Anything you can see, touch or hold.
- **Material**- What an object is made from.
- **Hard** -not easily broken or bent
- **Soft** – if something is soft, it is easy to cut, fold or change the shape of
- **Stretchy** – can be pulled to make it longer or wider
- **Waterproof**- something that keeps water out
- **Absorbent**- will soak up water quickly

What will I know by the end of this unit:

- I can describe an object including the material it is made from
- I can identify and name a variety of common materials including wood, plastic, glass, metal, water and rock
- I can talk about and describe the properties of different materials
- I can compare materials and sort them into groups, explaining my reason
- I can describe the changes to some materials by squashing, bending, twisting and stretching.
- I can identify and compare the suitability of a variety of everyday materials for particular uses
- I can begin to describe ways to sort materials
- I can begin to recognise that some changes can be reversed (reversible) and others cannot (non-reversible)
- I know that materials can have useful properties for a given job (including being waterproof, strong, hard, soft, flexible, rigid, light or heavy)

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Year Three – Animals including Humans

National Curriculum Links:

- 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 other animals have skeletons and muscles for support, protection and movement.

How does this link to my previous learning?

- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

How does this link to my future learning?

- Describe the simple functions of the basic parts of the digestive system in humans
- Identify the different types of teeth in humans and their simple functions
- Construct and interpret a variety of food chains, identifying producers, predators and prey.

What key vocabulary will I learn:

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).
A **vertebrate** has a backbone inside their body, an **invertebrate** does not.

What will I know by the end of this unit:

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*.

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Science Knowledge Organiser Spring 2

Year 4: Living things and their habitats

How does this link to my previous learning?

- All around us, there are some things that are alive, some things that are dead, and some things that have never been alive.
- All living things have certain characteristics that help to keep them alive and healthy.
- Living things live in habitats that suit them, and which provide for their basic needs.
- Living things depend on other living things in order to survive.

Classification of animals:

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.	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.
Reptiles -Reptiles are cold-blooded. -They normally lay eggs (but some don't). -Reptiles have scales or scutes.	Slugs -Slugs do not have shells. -They have a large muscular foot, which secretes mucus. -Their stomach is directly above their muscular foot.
Amphibians -Amphibians are cold-blooded animals. -They have moist, scaleless skin. It is often permeable. -Amphibians lay eggs.	Worms -Worms have long, narrow bodies. -Worms do not have limbs (arms and legs). -They are bilaterally symmetrical (both sides the same).
Fish -Fish are cold-blooded animals. -Fish can breathe underwater, using gills. -Fish lay eggs. -Fins help to propel fish through the water.	Spiders -Spiders have eight legs. -Spiders bodies are made of two main parts. -Spiders create silk from their spinneret glands. -Spiders lay eggs.
Birds -Birds are warm-blooded. -Birds have feathers, wings and a beak. -Birds lay eggs.	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.

National Curriculum Links:

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

How does this link to my future learning?

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals.

What will I know by the end of this unit:

Flowering Plants

Flowering plants grow flowers. They use pollination in order to reproduce.
Flowering plants make up about 90% of all species of plant.
Examples of flowering plants include: Sunflower, Daffodil, Orchid, Orange Tree, Banana Plant

Non-Flowering Plants

Non-flowering plants do not grow flowers. They rely on seed dispersal in order to reproduce.
Non-flowering plants make up about 10% of all species of plant.
Examples of non-flowering plants include: Fern, Moss, Algae, Conifer, Seaweed

Habitat Changes

Animals are often adapted to the habitats that they live in. However, habitats can change over time, which may present animals and plant life with difficulties.
Some of these changes are natural, e.g:
The seasons: temperatures rise in the summer and fall in winter. This means that some animals may need to migrate or hibernate.
Increased or decreased rainfall can also impact on a habitat. Floods and droughts can dramatically impact on environments.

Other habitat changes are man-made, e.g:
Harvesting fossil fuels, deforestation, dredging rivers, bottom trawling, urbanization, filling in wetlands and mowing fields.
Global warming is thought to be impacting on many habitats.

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Year Five - Forces

How does this link to my previous learning?

Compare how things move on different surfaces
Notice that some forces need contact between two objects, but magnetic forces can act at a distance

National Curriculum Links:

Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

What key vocabulary will I learn:

There are a number of different forces that affect us in our daily lives:
Gravity attracts all matter towards each other.
Applied force: The force placed on an object by a living creature.
Friction: the 'sticking' force that occurs when an object moves over another.
Air resistance is a type of friction force that pulls against an object travelling through the air. Some objects are more 'streamlined', meaning that the air pulls on them less, and they travel faster.
Water resistance is the friction force on objects floating or moving in water.
Surface resistance is the friction force of objects moving across a surface.

What will I know by the end of this unit:

Gravity has been around since the beginning of the Universe, and applies to all matter in the Universe.
-The bigger an object's mass, the more gravity it will have. The smaller the mass of an object, the less gravity it will be subject to.
-Without gravity we would fly right off the planet! The moon's gravity causes our ocean tides on Earth. The Sun's gravity keeps Earth in orbit around the Sun.
-We don't actually "feel" gravity. We only feel the effects of trying to overcome it by jumping or when we fall.
-Sir Isaac Newton discovered gravity around 300 years ago. The tale is that he saw an apple fall from a tree, and wondered what force made it fall to the ground.
Simple machines and mechanisms include pulleys, gears and levers. They can be used to turn a small force into larger forces. This means that we can use these machines to accomplish things more easily.
-Levers give us extra pushing or pulling force and help us lift greater weights.
-Gears are different sized cogs which work together to give a machine extra force.
-Pulleys are wheels and ropes that work together to life heavy objects.

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Year Six – Living Things and their Habitats

National Curriculum Links:

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
- Give reasons for classifying plants and animals based on specific characteristics.

How does this link to my previous learning?

- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- Describe the life process of reproduction in some plants and animals.

What will I know by the end of this unit:

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!

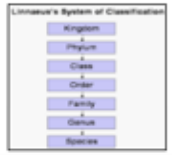
He was made a noble by the Swedish King. He lived from 1707-1778. Parts of his system are still used today.

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.



What key vocabulary will I learn:

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.

Examples of 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.