Hanslope Primary School
Science Knowledge Organiser Spring 2

Year One - Animals including Humans

National Curriculum Links:

- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- Identify and name a variety of common animals that are carnivores, herbivores and omnivores
- Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

How does this link to my previous learning?

- Knowing the names of animals
- Naming farm/jungle/sea/pet animals

How does this link to my future learning?

- Notice that animals, including humans, have offspring which grow into adults
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)

What key vocabulary will I learn:

Mammals: Mammals are warm-blooded creatures. Most have hair.
They give birth to live young. They produce milk to feed them.
- Humans are mammals. Other examples are monkeys, lions, bears, dogs, cats and cows

Reptiles: Reptiles are cold-blooded. They lay eggs/ have scales. They breathe through lungs.
- Examples include lizards, crocodiles & snakes.

Fish: Fish are cold-blooded and live in water. They breathe through gills. Have fins/scales.
- Examples include sharks, salmon, & rays.

Birds: Birds are warm-blooded. They lay eggs/ often have feathers and wings. Most have hollow bones & can fly.
- Examples include robins, penguins & ducks.

Amphibians: Amphibians are cold-blooded. They live in water and land. They have 3 life stages: eggs, larvae, & adult.
- Examples are frogs, toads & salamanders.

Carnivores eat meat. Examples include lions, crocodiles, hyenas, sharks
Herbivores eat plants. Examples include elephants, deer, rabbits, cows
Omnivores eat meat and plants. Examples include brown bears, raccoons, badgers, lizards

What will I know by the end of this unit:

- Animals are living things.
- Like plants, animals need food and water to live.
- Unlike plants (which make their own food) animals feed themselves by eating plants or other animals.
- Animals are also able to sense (including see, hear, smell, taste, touch) what is going on around them.
- Millions of animals live on earth.

Hanslope Primary School
Science Knowledge Organiser Spring 2

Year Two: Living things and their habitats

What key vocabulary will I learn:

- Living – lion, oak tree
- Dead – fallen leaves,
- Never been alive – phone, lamp post

- **M** MOVEMENT Animals move in many different ways. Plants grow and turn towards light.
- **R** RESPIRATION Plants and animals use oxygen in the air to turn food into energy.
- **S** SENSITIVITY Living things can detect changes in their surroundings.
- **G** GROWTH Living things get bigger and grow.
- **R** REPRODUCTION Animals have young. Plants create seeds from which new plants grow.
- **E** EXCRETION Living things get rid of things that they make but don't need.
- **N** NUTRITION Living things need food/nutrients for energy.



National Curriculum Links:

- explore and compare the differences between things that are living, dead, and things that have never been alive
- 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
- identify and name a variety of plants and animals in their habitats, including microhabitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

How does this link to my future learning?

- 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.

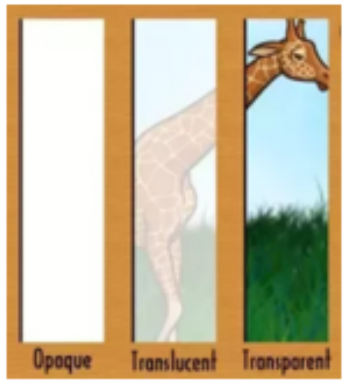
What will I know by the end of this unit:

- A habitat is a home environment for plants, animals, and other living things.
- Examples of habitats include:
- Desert; Rainforest; Woodland; Ocean; Meadow; Seashore.
- Micro-habitats are small, specific home environments, e.g. individual trees, a pond, under a rock, or a pile of logs.
- Habitats contain features that make them suitable to the things that live there, e.g., food, shelter, or temperature.
- Habitats can change over the year & over time, so some animals migrate.

Every living thing needs food in order to create energy. This process is called nutrition.
Plants achieve nutrition by photosynthesising, using water, carbon dioxide and light.
Animals cannot photosynthesise. They need to eat food (either plants or other animals) in order to get energy.
Therefore, living things depend upon one another to live.

Hanslope Primary School
Science Knowledge Organiser

Year Three - Light



National Curriculum Links:

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 an opaque object
Find patterns in the way that the size of shadows changes.

How does this link to my future learning?

Recognise that light appears to travel in straight lines
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
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
Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

What key vocabulary will I learn:

- Light is a **form of energy** that makes it possible to see.
- Light is **given off some objects** (for example the Sun). Darkness is when there is no light.
- Light can **reflect** off surfaces (e.g. mirrors)
- Objects can be labelled as **transparent, translucent, or opaque**, depending on the amount of light that they let through.
- **Shadows** are formed when light is blocked by an opaque object.
- When light hits an object, it can be **absorbed** by the object, **reflect** (bounce off) the object, or **transmit** (pass through) an object.
- The three key terms below tell us how much light objects let through them.
- **Transparent –** Transparent objects allow all of the light to pass through them. This means that we can clearly see through them.
- **Translucent –** Translucent objects only allow some light to pass through them. This means that we can partially see through them.
- **Opaque –** Opaque objects do not allow any light to pass through them. This means cannot see through them at all.

What will I know by the end of this unit:

Dark
Darkness is the absence of light. In other words, where there is no light, it is dark!
Human vision is unable to see colours when there is high levels of darkness (too little light).
At night, the sky is darker because there is a lack of light from the sun.
Reflection
Light may also reflect off the surface of an object.
This means that light bounces off the object, sending it in another direction.
Some examples of materials/objects that reflect light include mirrors or polished metal surfaces.
Absorption
When light hits an object, it may be absorbed into the object.
This means that it doesn't bounce off or pass through the object.
Some examples of materials/objects that absorb light include wood, brick and stone.
Transmission
Light can also be transmitted through certain objects.
This means that it passes through the object. It can be seen from the other side of the object.
Some examples of materials/objects that transmit light include windows and clean water.
*Some types of light (e.g. light from the sun) can be dangerous for our eyes and skin. This is because they contain **UV rays** that can cause damage. There are several things that we can do to protect ourselves in the sun.*

Hanslope Primary School
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.

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.

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.

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.

Hanslope Primary School
Science Knowledge Organiser Spring 2

Year 5: Earth and Space

What key vocabulary will I learn:

- **Celestial body -** objects in space such as the sun, moon, planets, and stars.
- **Spherical** – shaped like a sphere
- **Rotation** – spinning on an axis or centre
- **Names of planets** – are (from closest to furthest away from the Sun) Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Jupiter is the largest planet and Mercury is the smallest.
- **Dwarf planet** – are similar to the solar system's eight planets but are smaller. Like planets, they are large, roundish objects that orbit the Sun but that are not moons.
- **Orbit** – a regular, repeating path that one object in space takes around another one.
- **geocentric model** – From ancient times many people believed that the solar system was Geocentric. This means they believed that the Earth was the centre of the solar system and all the other planets and Sun orbited it.
- **heliocentric** model – Anything that's heliocentric has a sun at its centre. Since our solar system is heliocentric, the Earth revolves around the sun (and not the other way around, as people in the Middle Ages believed).
- **shadow** clocks – It consisted of a vertical stick or pillar, and the length of the shadow it cast gave an indication of the time of day.
- **sundials** – A sundial is made up of two parts: a flat circular plate and a stick called a gnomon. The gnomon casts a shadow on the plate and this shadow shows the time.
- **astronomical clocks** - An astronomical clock is a clock with special mechanisms and dials to display astronomical information. It shows the relative positions of the sun, moon, zodiacal constellations, and sometimes major planets.

National Curriculum Links:

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- Describe the movement of the Moon relative to the Earth
- Describe the Sun, Earth and Moon as approximately spherical bodies
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

What will I know by the end of this unit:

- The Earth (our planet) is a part of the Solar System. At the centre of the Solar System is the Sun. The Sun is a star.
- There are 8 planets and 5 dwarf planets in the Solar System, which orbit (go around) the Sun.
- It takes Earth just over 365 days to go around the Sun (one year).
- The Earth rotates on its axis once every 24 hours (one day). This causes day and night, as different parts of the planet face the Sun.
- When a point on Earth is facing the Sun, it is daytime. When facing away, it is night-time.
- The Moon orbits around the Earth. The Sun, Earth and Moon are all roughly spherical.
- The Sun is a star: a huge ball of hot gas that gives off light & heat. The Earth (and all of the planets in the Solar System) orbit the Sun.
- The Earth and other planets are held in place around the Sun by gravity – the same force that keeps you on the Earth!
- Some objects orbit around the planets. These are called moons. The Earth has one moon (just called The Moon). The Moon is much smaller than the Earth, and takes one full day to complete an orbit around the Earth.

Hanslope Primary School
Science Knowledge Organiser Spring 2

Year 6: Evolution and Inheritance

What will I know by the end of this unit:

INHERITANCE AND MUTATION

- Living things produce offspring of the same kind.
- Some of a parent's characteristics are passed down to the offspring – this is called inheritance.
- This is why we often share similar features with our parents, and some conditions are shared.
- Inheritance is genetic, not environmental. E.g. If two blonde-haired parents dye their hair black, this does not mean they will have a black-haired child.
- Some features are new to the offspring. These are called mutations. This is why we are not exact copies of our parents.
- These changes in offspring over time allow evolution to take place.

EVOLUTION

- Sometimes, changes that offspring have from their parents are advantageous – they allow the offspring to cope better in their environment.
- However, often the changes are not advantageous (called maladaptation). When this is the case, the offspring will find it more difficult to thrive.
- Natural selection can ensure that, over time, the advantageous characteristics survive in the species.
- For example, many polar animals have adapted to possess layers of blubber and/or fur (for warmth) and white outer coats (for camouflage).
- The dodo, with no predators on its island, had adapted in a number of ways that made it unable to survive when humans arrived (maladaptation).

National Curriculum Links:

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

What key vocabulary will I learn:

- Evolution is a change over time. It occurs when there is competition to survive (natural selection).
- Characteristics are passed from parents to their offspring. This is called inheritance.
- Offspring are not identical to their parents. Some characteristics are inherited, but some are new in the offspring – these are called mutations.
- Fossils are remains of living things, and provide evidence about living things from the past.
- Animals and plants are suited to their environments, and adaptation leads to advantageous changes.