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.

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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.

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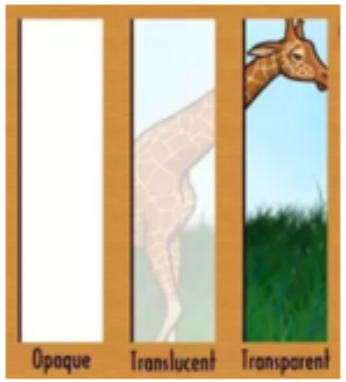
Scientist:
Percy Shaw

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.*

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Year Four – Animals Including Humans - Healthy Eating, Teeth and Digestion

National Curriculum Links:

- 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.

How does this link to my previous learning?

-Animals cannot create their own food, they must eat in order to get nutrition.
-Because of this, animals are called consumers.
-Animals and humans need the right types and amounts of nutrition.
-Nutrition groups include carbohydrates, fats, proteins, fibre, vitamins and minerals.
-Skeletons are important for support, movement and protection. Muscles help us to move and keep our posture.

How does this link to my future learning?

- describe the changes as humans develop to old age.

What key vocabulary will I learn:

-**Incisors** (at the front) are used to cut food.
-**Canines** are used to tear food.
-**Pre-molars** are used to crush food.
-**Molars** (at the back) are used to grind food.
Ingestion – The food is taken in by the mouth, and broken down by teeth and saliva.

Ingestion – The food is taken in by the mouth, and broken down by teeth and saliva.
Absorption – Food is further broken down in the stomach & intestines. Nutrients are absorbed into our bodies through our blood. The liver and pancreas produce the bile and enzymes to help the digestion along.
Excretion – Waste food that the body doesn't need is sent to the anus for excretion.

-**Producers** are able to make their own food (for example plants, through photosynthesis).
-**Primary consumers** are animals that eat producers.
-**Secondary consumers** are animals that eat primary consumers.
-**Tertiary consumers** are animals that eat secondary consumers.

What will I know by the end of this unit:

Humans have up to 32 adult teeth, made up of 4 different types. Each of these types have an important job. Our teeth are like this because we are omnivores. Different animals have different teeth layouts depending on their food.

There are three main stages of the digestive system: Ingestion, absorption, excretion.
Digesting food takes many hours.

Food chains show how each living thing gets food, and how nutrients are passed from producers through different consumers.
-Food chains begin with plant life, and end with animal life. At the top of the food chain are apex predators – animals which have no natural predators that eat them.
Each plant and animal in the food chain is affected by the others. For example, if there were fewer mice in the habitat, there may be more plants (because the mice aren't eating them) but less snakes (fewer mice to eat).

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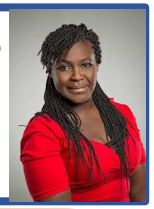
Scientist:Maggie Aderin Pocock



Year 5: Earth and Space

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 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.

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.

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Year Six - Light

How does this link to my previous learning?

- Light is a form of energy that makes it possible to see.
- Light is given off some objects (for example the Sun). Darkness is the absence of light.
- Light can reflect off surfaces (e.g. mirrors). Light is absorbed by other materials.
- 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.

National Curriculum Links:

- 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:

-We see things because...
a.) they are a **light** source, sending light into our eyes, or
b.) light is **reflected** from a light source off them and into our eyes.
When the light enters our eyes, we see the object!
-E.g. we see the sun because it is a light source, sending light into our eyes.
-However, the moon is not **luminous** (does not produce its own light). We see it because light from the sun reflects off it into our eyes.
- After light reflects off objects, it continues to travel in a straight line, but in a new direction.
-**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).

What will I know by the end of this unit:

-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.
-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.