Biology

Plants

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| EYFS | Key knowledge | New Vocabulary |
| 1. Develop an understanding of growth.
2. Shows care and concern for living things and the environment.
3. Make observations of plants and explain why some things occur and talk about changes.
4. Can talk about some of the things they have observed, such as plants.
 | Know difference between know a plant/treeKnow that after a plant has been planted it needs watering to stay alive.Know some key features of each season (What the weather is like, what happens to the growth of plants eg Autumn/Spring.Knows how to talk about things they observe on seasonal walks/ bug hunts and talking about things they find whilst playing. | Plant, seed, bulb, tree, Seasons, Spring, Summer Autumn WinterWhat? Why? (How to use these words to ask questions and talk about what they have found) |
| Milestone 1 |  |  |
| 1. Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen.
2. Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.
3. Observe and describe how seeds and bulbs grow into mature plants.
4. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
 | Know a rose bush, a daffodil and a poppy by sightKnow an oak tree, a birch tree and a horse chestnut tree by sightKnow that evergreen trees maintain their leaves throughout the year and that deciduous trees shed their leaves in autumnKnow that a flowering plants consist of roots, stem, leaves and flowers, and that a tree’s stem is called a trunkKnow that seeds and bulbs need to be buried underground in soil and that they will grow (germinate) into adult plants under the right conditions (water, warmth)Know that plants that are deprived of light, food or air will not grow and will die. | energy, growth, deciduous, evergreen, flower, plant, tree, structure, roots, stem, leaf, trunk, flower, germinate  |
| Milestone 2 |
| 1. Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers.
2. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
3. Investigate the way in which water is transported within plants.
4. Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
 | Know that different parts of plants have one or more functions (jobs)Know that the roots collect water and minerals from the soil, and hold the plant firmly in the groundKnow that the stem holds up the leaves so that they can gather light to make food and holds up the flowers so that they can receive pollen and disperse their fruits; Know that the stem also transports water and minerals from the roots to the other parts of the plantKnow that the leaves make food by trapping light and using its energy to turn carbon dioxide and water into carbohydratesKnow that the function of a flower is reproduction, where flowers of the same kind exchange pollen–made by an anther–in a process called fertilisation, and a structure in the flower’s ovary called an ovule becomes a seed; the ovary then becomes a fruit which helps the seed leave the plant in a process called dispersal. | reproduction, bulb, seed, survival, temperature, carbon dioxide, carbohydrates, dispersal, anther, pollination, ovule, fertilisation  |
| Milestone 3 |
| 1. Relate knowledge of plants to studies of evolution and inheritance.
2. Relate knowledge of plants to studies of all living things.
 | Know how plants and animals may evolve through adaptation to their environment.Know the ways in which the life processes of all living things vary | Adaptation, evolution. Inheritance  |

Living things

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| EYFS | Key knowledge | New Vocabulary |
| 1. Comments and questions about the place they live or the natural world.
2. Shows care and concern for living things and the environment.
3. Can talk about things they have observed such as plants and animals.
4. Notices features of objects in their environment.
5. Comments and asks questions about their familiar world.
 | Know a variety of different animals and where you would find them. ( Farms, jungle, under the sea, hot and cold climate). They can talk about these animals.Know that animals, humans and plants need to be looked after to stay healthy. Food and water.Know that they can talk about animals/insects and natural objects they find whilst playing .Know about the life cycle of a frog/chicken or butterfly by observing and caring for them in class. | Alive, grow, egg, hatch, spawn, similar, different, old young |
| Milestone 1 |  |  |
| 1. Explore and compare the differences between things that are living, that are dead and things that have never been alive.
2. 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.
3. Identify and name a variety of plants and animals in their habitats, including micro-habitats.
4. 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.
 | Know that living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things.Know that polar bears are an example of an animal adapted to its environment–thick fur for warmth and oily paw pads to ensure that they don’t freeze to the ice.Know that cacti are an example of a plant adapted to its environment–thick skin keeps a store of water safe; sharp spikes keep animals from stealing the waterKnow that pine trees have thick bark and pine cones to protect against cold wintersKnow that woodlice live under logs–an example of a microhabitat-as they need somewhere dark and damp so that they do not dry outKnow that frogs can live in ponds–an example of a microhabitat-as the water in which to lay their eggs (frogspawn)Know that plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals.Know that the arrows on a food chain show the direction that the energy travels. | habitat, growth, absorption, herbivore, carnivore, omnivorebirth, decay, energy, microhabitat, dead, life cycle, food chain, source, nutrients, reproduction, consumption, environment |
| Milestone 2 |
| 1. Recognise that living things can be grouped in a variety of ways.
2. Explore and use classification keys.
3. Recognise that environments can change and that this can sometimes pose dangers to specific habitats.
 | Know that animals can be grouped based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behaviour (e.g. herbivores, carnivores and omnivores)Know that living things are divided into kingdoms: the animal kingdom, plants, fungi, bacteria, and single-celled organismsKnow that a species is a group of living things have many similarities that can reproduce together produce offspringKnow that a classification key uses questions to sort and identify different living things Know how to use a classification key to identify living things Know how to create a classification key to sort plants on the school premisesKnow that changes to the environment can make it more difficult for animals to survive and reproduce; in extreme cases this leads to extinction, where an entire species diesKnow that human activity – such as climate change caused by pollution - can change the environment for many living things, endangering their existenceKnow that the polar bear is a famous example of climate change endangering the existence of a species; as the climate changes and gets warmer, the sea ice on which polar bears live reduces in amount making it harder for them to survive and reproduce | kingdom, classification key, species, fungi, bacteria, climate change, characteristics, offspring, extinction, pollution |
| Milestone 3 |  |  |
| 1. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
2. Describe the life process of reproduction in some plants and animals.
3. Describe how living things are classified into broad groups according to common observable characteristics.
4. Give reasons for classifying plants and animals based on specific characteristics.
 | Know that the life cycle of a living thing is a series of stages of development starting with a fertilized egg in animals or a seed in many plantsKnow that in most mammals (e.g. dogs) a fertilized egg develops in the womb into an embryo and is then born and fed on milk before it is weaned onto the food that is adapted to eat; it then develops to maturity in a period called adolescence after which it can reproduce and the cycle can begin again Know that in amphibians (e.g. frogs) a fertilized egg develops into an embryo and then hatches into a tadpole; the tadpole develops adult characteristics, metamorphoses into the adult form after which it can reproduce and the cycle can begin againKnow that in many insects (e.g. butterflies) a fertilized egg develops into wingless feeding form called a larva (caterpillar); the larva feeds then later becomes a pupa (chrysalis) with a protective cocoon; inside this cocoon, the pupa metamorphoses into the adult butterfly after which it can reproduce and the cycle can begin again Know that in birds (e.g. robins) a fertilized egg hatches in a nest (a hatchling) and is fed by its parents until it is ready to fly (i.e. becomes a fledgling); it then leaves the nest and grows into an adult after which it can reproduce and the cycle can begin again Know that humans go through stages of development; they begin as fertilized eggs and then develop into embryos before developing into babies; once they are born, these new born babies become infants then into young children (roughly 2-12 years old); children develop into adults during adolescence (roughly 12-16 years old) at which age they become physically capable of reproduction; as adults develop into old age (roughly 55+ years old) they experience changes in their body which require them to move more carefully and rest more frequentlyKnow that there are three types of micro-organism: viruses, fungi and bacteria; of these three, viruses are often not really considered to be alive by many scientists mainly because they don’t have the ‘machinery’ to reproduce inside themKnow that germs are disease-causing bacteriaKnow that an arthropod is an invertebrate with a hard , external skeleton and jointed limbsKnow that insects are a type of arthropod; their bodies consist of six legs, a head, a thorax and an abdomen; most insects also have a pair of antennae and a pair of wings Know that an arachnid (e.g. spider) is a type of arthropod with eight legs and no antennae or wingsKnow that a crustacean is a type of arthropod with two pairs of antennae (e.g. woodlouse)Know that a myriapod is an arthropod with a flat and long or cylindrical body and many legs (e.g. centipede) | life cycle, life span, embryo, womb, fertilisation, weaned, adolescence, metamorphosis, pupa, larva, chrysalis, caterpillar, tadpole, hatchling, fledgling, insectmicro-organism, virus, thorax, arthropod, abdomen, arachnid, antenna, jointed limbs |

Animals and Humans

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| EYFS | Key knowledge | New Vocabulary |
| 1. Children should be able to identify different parts of their body.
2. Have some understanding of healthy food and the need for variety in their diets.
3. Be able to show care and concern for living things.
4. Know the effects exercise has on their bodies.
5. Have some understanding of growth and change.
6. Can talk about things they have observed including animals.
 | Know and name different parts of their body.Know that some food are good for us and others aren’t.Know what we need to stay healthyKnow different ways that excerise effects our bodies. ( Heart pumping faster, hot and tired)Know that we are growing looking at when we were a baby and how we have changed.Know that animals grow up too. Looking at the life cycle of the a frog/chick/butterfly. | Grow, change, similar, different, healthy, excersise. Head shoulder knees toes elbow, ankle, wrist neck, back  |
| Milestone 1 |  |  |
| 1. Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates.
2. Identify and name a variety of common animals that are carnivores, herbivores and omnivores.
3. Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets).
4. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
5. Notice that animals, including humans, have offspring which grow into adults.
6. Investigate and describe the basic needs of animals, including humans, for survival (water, food and air).
7. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
 | Know that a trout is an example of fish, a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human are examples of a mammalKnow that herbivorous animals eats plants; a carnivorous animal eats other animals; omnivorous animals eat both animals and plantsKnow that a cat is an example of a carnivore; that a rabbit is an example of a herbivore; know that many humans are examples of omnivores (though not vegetarians) Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backboneKnow that fish are different in having gills so that they can breathe underwater and scaly skinKnow that amphibians are different in that they begin their lives with gills but then develop lungs and breath on landKnow that reptiles are different in that they breath air and have scaly skinKnow that birds are different to other animals in that they have feathers and wingsKnow that mammals are different to other animals in that they have fur/hair and they feed milk to their youngKnow that feet, legs, arms, hands, torso, head, skin, ears, eyes, nose, mouth and tongue are part so the body and identify themKnow that eyes are associated with sight, ears with sound, nose with smell, tongue with taste and skin with touch.Know that plants and animals produced offspring that grow into adults.Know that animals, including humans, need food, water and air to surviveKnow the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foodsKnow that more than half of our diet should be made up of carbohydrates, fruit and vegetables Know that fats and sugary foods should be eaten rarely and in small amounts Know that getting the right amount of each food group (including over half of the diet made up of fruit, vegetables and carbohydrates) is called a balanced dietKnow that people need to exercise often to help their body stay strong and fitKnow that keeping clean, including washing and brushing teeth, is an important part of staying healthy  | energy, growth, habitat, fish, amphibian, reptile, bird, mammal, offspring, carnivore, herbivore, omnivore, vertebrate, skeleton, organ reproduction, offspring, adult, survival, temperature, hygiene, exerciseBalanced diet |
| Milestone 2 |
| 1. Construct and interpret a variety of food chains, identifying producers, predators and prey.
2. Identify that humans and some animals have skeletons and muscles for support, protection and movement.
3. Describe the simple functions of the basic parts of the digestive system in humans.
4. Identify the different types of teeth in humans and their simple functions.
 | Know that proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy bones and teeth)Know that lack of a nutrient can cause ill health; for example, a lack of vitamin D leads to a disease called ricketsKnow that excess of a food group can cause ill health, such as tooth decay due to excess sugarKnow that excess fat from fatty foods such as butter and cheese - and created in the body from excess calories – builds up in the body and can cause obesityKnow that excess body fat can lead to heart disease and increases the strain on joints and growing bonesKnow that animals, including humans, have a skeleton made up of solid objects.Know that some animals (such as insects) have an exoskeleton – a solid covering on the outside of their bodyKnow that many invertebrates (such as earthworms and slugs) have water held inside by muscles which act like a skeletonKnow that skeletons provide support for muscles and protect the body; for example, the ribcage protects the vital organs in the human bodyKnow that human skeletons are made up of bones and cartilageKnow that muscles can only contract, so they must be arranged in pairs in the body so that as one contracts the other loosensKnow that food passes through the body with the nutrients being extracted and the waste products excreted, and that this process is called digestionKnow that the process of digestion involves breaking complex foodstuffs into simpler building blocks that can be absorbed by the bodyKnow that the process of digestion begins with food being chewed in the mouth by the teeth and saliva addedKnow that a human has three types of teeth – incisors, canines and molars – and that these each perform different functionsKnow that incisors slice food, canines tear food (especially meat) and that molars grind foodKnow that children develop an initial set of teeth which are gradually replaced between the ages of 6 and 12Know that food is squeezed down the oesophagus towards the stomach in a wave-like action called peristalsis Know that the stomach releases acid and enzymes to continue breaking down the food; the stomach is an organ; an organ is a part of living thing that is self-contained and has a specific important jobKnow that further enzymes and bile break down the food further as it moves towards the small intestineKnow that the small intestine adds more enzymes and then absorbs the nutrientsKnow that the large intestine absorbs water from the undigested foodKnow that undigested food is stored in the rectum before being excreted through a muscle called the anusKnow that a food chain traces the path of energy through a habitatKnow that all energy for a food chain initially comes from the Sun which is absorbed and turned into energy by plants which are called producersKnow that consumers take in energy by eating Know that an animal that is eaten by another is called prey, and that an animal that eats other animals is called a predator Know that the first consumer in a food chain is called a primary consumer, the second is called a secondary consumer and above it is called a tertiary consumer Know that the arrows in a food chain show the direction that energy is travelling through a habitat |  digestion, excretion, peristalsis, anus, small intestine, large intestine, stomach, rectum, oesophagus, tongue, saliva, acid, bile, enzymes, incisors, canines, molars, predator, prey, producer, consumer, primary, secondary, tertiary |
| Milestone 3 |
| 1. Describe the changes as humans develop to old age.
2. Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
3. Recognise the importance of diet, exercise, drugs and lifestyle on the way the human body functions.
4. Describe the ways in which nutrients and water are transported within animals, including humans.
 | Know that the heart and lungs are organs protected by the ribcageKnow that blood travels around the body transporting water and nutrients that have been absorbed into the blood stream from digestion; blood also carries oxygen around the body which is used to power the body; this use of oxygen to create energy is called respirationKnow that the heart beats, pumping blood around the body and that blood vessels carry the blood; arteries carry blood away from the heart; veins carry blood towards the heart; capillaries are tiny blood vessels that connect arteries and veinsKnow that the heart is composed of four chambers: two atria and two ventricles; the aorta is the largest artery in the body and most major arteries branch off from it Know that when we exercise, our heart beats more frequently so that the oxygen that is used around the body can be replenished; it returns to a resting heart rate afterwards; fitter people tend to have lower resting heart ratesKnow that drugs are chemicals that have an impact on the natural chemicals in a person’s; know that drugs can be harmful or helpful, depending on what they are and how they are used; know that all drugs can be harmful if overusedKnow that paracetamol and aspirin are examples of drugs that can be helpful as a painkillerKnow that cannabis and cocaine are examples of illegal drugs that can have serious negative effectsKnow that alcohol and tobacco are examples of drugs that are legal to adults but that can have serious negative effects, such as liver disease and lung disease, respectively | artery, aorta, atrium, blood vessels capillary, circulatory system, vein, pulse, ventricle, replenished, resting heart rate respiration |

Evolution and inheritance

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| EYFS | Key knowledge | New Vocabulary |
| 1. Knows some of the things that make them unique, and can talk about some of the  similarities and differences in relation to friends or family.
2. Can talk about some of the things they have observed such as plants and animals, natural and found objects.
3. Developing an understanding  of growth, decay and changes over time.
4. Shows care and concern for living things

and the environment.  | Know what makes them different to their peers. Knows that people have their differences.( celebrations, families, routines)Know about how different peoples families and customs by listening and sharing with their peers.Know that they are growing. What has changed since they were a baby. Know that adults have different jobs and roles of responsiblities by exploring through role play and sharing with peers. | Family, similar, different, growing, jobs, baby, toddler, child, adult. |
| Milestone 1 |  |  |
| 1. Identify how humans resemble their parents in many features.
 | Know that plants and animals produced offspring that grow into adults | Offspring |
| Milestone 2 |
| 1. Identify how plants and animals, including humans, resemble their parents in many features.
2. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
3. Identify how animals and plants are suited to and adapt to their environment in different ways.
 | Know that fossils form when a plant or animal dies and is quickly covered with silt or mud so that it cannot be rotted by microbes or eaten by scavenging animals; in time layers of sediment build, squashing the mud and turning it to stone around the dead plant or animal; the materials in the body are replaced by minerals that flow in water through the rock, leaving a rock in the shape of the animal or plant that was once there | Fossil, adaptation, microbes, sediment |
| Milestone 3 |
| 1. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
2. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
3. Identify how animals and plants are adapted to suit their environment in different ways and how that adaptation may lead to evolution.
 | Know that all life on Earth began from a single point around 4.5 billion years agoKnow that living things changes over time and that this gradual change is called evolutionKnow that natural selection is the cause of this change; natural selection works as across a species there is natural variation within a species; there is also competition to survive and reproduce and that members of a species with advantageous characteristics survive and reproduce - these characteristics are passed down to their offspring; members of a species with less advantageous characteristics do not survive and reproduce – these characteristics are not passed down to offspring Know that offspring are vary and are not identical to their parentsKnow that Charles Darwin posited this theory of evolution by natural selectionKnow that the gradual change of species over millions of years can be observed by looking at examples of fossil | evolution, natural selection, variation, advantageous |