



The Wild Escape Science Curriculum knowledge

Produced by

Art Fund_

Funded by



Supported using public funding by
**ARTS COUNCIL
ENGLAND**

England

Science Living things and their habitats curriculum knowledge	3
England curriculum content Living things and their habitats Years 4 to 6	5
Year 4 programme of study	5
Year 5 programme of study	6
Year 6 programme of study	7

Northern Ireland

Science and Technology The World Around Us curriculum knowledge	8
Northern Ireland curriculum content The World Around Us Age 8-11	10
Key Scientific Ideas at Primary Level	11

Scotland

Sciences Planet Earth & Biological Systems curriculum knowledge	12
Scotland Sciences curriculum content Planet Earth & Biological Systems Age 9-11 Planet Earth: Biodiversity and interdependence	14
Biological systems: Inheritance	14

Wales

Science and Technology Being Curious and The world around us is full of living things Curriculum knowledge	15
New Welsh Curriculum content Being Curious and The world around us is full of living things Age 8-11	16

England

[Click to view full BBC Bitesize page](#)

Science Living things and their habitats curriculum knowledge

From BBC Bitesize:

Classification

is putting things into groups. Living things can be divided into these groups or 'classified' by looking at similarities and differences between the way they look and behave.

Classification keys

A key is a set of questions about the characteristics of living things. The answer to the first question gives you another question to answer and so on. As you answer more questions you narrow down your living thing until eventually the last question tells you what it is.

Animals

Animals are divided into two main groups. Animals that have a backbone (spine) are called vertebrates. Animals that don't have a backbone are called invertebrates.

Vertebrates and invertebrates are divided into smaller groups. Vertebrates, for example, are divided into five groups:

- fish
- amphibians (like frogs and toads)
- reptiles (like snakes and crocodiles)
- birds
- mammals (like humans, dogs and dolphins)

There are many different groups of invertebrates too. They include invertebrates which have:

- soft bodies such as jellyfish, worms and molluscs (like slugs and squids).
- hard bodies such as insects, crustaceans and spiders.

Food chains

All animals and plants need food to live and they are all part of a food chain.

- A herbivore is an animal that only eats plants
- An omnivore eats plants and animals
- A carnivore only eats animals
- An insectivore eats some animals such as insects and worms

Producers and consumers

- Plants make food using energy from the sun. They are called producers.
- Animals are called consumers because they eat plants and other animals.
- Animals that eat other animals are called predators.
- The animals that are eaten are called prey.

Lifecycles

A lifecycle is the different stages of life for all living things, including humans.

Stages in a lifecycle

There are normally four major events in the lifecycle of animals: birth - growth - reproduction – death

Most amphibians go through **metamorphosis** during their lifetime.

Reproduction

This means 'to have babies or offspring'. To reproduce, animals need a male and a female. Together they can create offspring when they mate. This is called **sexual reproduction**.

During sexual reproduction a sperm from the male joins with an egg from the female. This is called **fertilisation**.

After fertilisation females of the following living things will lay eggs:

- fish
- reptiles, like snakes
- birds
- amphibians, like frogs

Some animals will produce lots of eggs because many of them won't grow into adults.

After sexual reproduction in mammals (including humans), the female grows her baby or babies inside her until they are developed enough to be born.

Habitats

- Polar habitats
- Ocean habitats

- Woodland habitats

Woodland habitats are green and shady. We find these in gardens, parks and the countryside. Lots of animals and plants are found here.

- Rainforest
- Urban habitats:

Urban habitats are in towns and cities. They are often busy and noisy.

- Desert habitats
- Coastal habitats

Coastal habitats are the places where the land meets the ocean. They can have rocky cliff edges, sandy beaches and rock pools. There are different plants and animals that are suited to live there.

- Pond habitats

In the UK, there are lots of ponds. We find ponds in parks, in the countryside and even in our gardens. Pond habitats are the home to lots of different animals and plants, like water lilies, frogs and ducks.

Changing environments

Our environments are always changing. Sometimes these changes are natural and can't be avoided, but humans are also causing some changes that aren't good for the planet.

Deforestation

Humans are changing the environment in lots of different ways. These changes often affect the living things in them. Deforestation means cutting down trees. At the moment we are cutting down more trees than we plant. It takes some forests hundreds of years to grow and for animals and plants to live there.

Development	Reasoning
<u>Farming</u>	Farms produce food.
<u>Mining</u>	Coal, metals and stones are important to build houses, roads and cars.
<u>Landfill</u>	Humans are making more waste than ever. If it can't be recycled, it gets burnt or put in big holes in the ground.
<u>Urban</u>	Many towns and cities are spreading outwards so more people can live there.

All these developments are important - but it is equally important that our environments and their living things are looked after. **This is called conserving.**

Changes to environments can cause danger to animals and plants that live in them, including us.

England curriculum content Living things and their habitats Years 4 to 6

Year 4 programme of study

Pupils should be taught to:

- 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



Notes and guidance (non-statutory)

Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals, flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.

Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.

Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.



Year 5 programme of study

Pupils should be taught to:

- 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



Notes and guidance (non-statutory)

Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.

Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.

Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.



Year 6 programme of study

Pupils should be taught to:

- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics



Notes and guidance (non-statutory)

Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.

Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.

Evolution and inheritance identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.



Northern Ireland



Science and Technology The World Around Us curriculum knowledge

From BBC Bitesize:

[Click to view full
BBC Bitesize page](#)

Classification: Animal groups

Animals can be divided into groups or 'classified' by looking at the similarities and differences between them.

Animals are divided into two main groups. Animals that have a backbone are called vertebrates. Animals that don't have a backbone are called invertebrates.

Classification keys

A key is a set of questions about the characteristics of living things. You can use a key to identify a living thing or decide which group it belongs to by answering the questions.

Vertebrates and Invertebrates

Animals can be classified as either vertebrates or invertebrates.

Vertebrates are animals that have a backbone inside their body. The major groups include fish, amphibians, reptiles, birds and mammals.

Invertebrates are animals that **don't** have a **backbone**. Some have soft bodies, like worms, slugs and jellyfish. Other invertebrates, like insects, spiders and crustaceans, have a hard outer casing called an exoskeleton. This protects their body a bit like a suit of armour.

Life cycle

All animals, including humans, are born, they get older and bigger and some will go on to have children. In the end, all animals die. We call this a life cycle. Animals are small when they start life. Over time they grow bigger and their bodies change. When they are grown up, they might reproduce and have young animals of their own. These children will get older and may eventually also have children too, and so the life cycle keeps going.

Food chain

A food chain shows how plants and animals get their energy.

Producers and consumers

A food chain always starts with a **producer**. This is an organism that makes its own food. Most food chains start with a green plant, because plants can make their food by **photosynthesis**. A living thing that eats other plants and animals is called a **consumer**.

Predators and prey

A predator is an animal that eats other animals. The animals that predators eat are called prey. Predators are found at the **top** of a food chain.

Habitats

- Polar habitats
- Ocean habitats
- Woodland habitats

Woodland habitats are green and shady. We find these in gardens, parks and the countryside. Lots of animals and plants are found here.

- Rainforest
- Urban habitats

Urban habitats are in towns and cities. They are often busy and noisy.

- Desert habitats
- Coastal habitats

Coastal habitats are the places where the land meets the ocean. They can have rocky cliff edges, sandy beaches and rock pools. There are different plants and animals that are suited to live there.

- Pond habitats

In the UK, there are lots of ponds. We find ponds in parks, in the countryside and even in our gardens. Pond habitats are the home to lots of different animals and plants, like water lilies, frogs and ducks.

Ecosystems

A community of **animals, plants** and **microorganisms**, together with their **habitat** is called an **ecosystem**. For example, a pond ecosystem may consist of a pond habitat, inhabited by aquatic plants, microorganisms in the mud at the bottom, fish in the water and a heron on the bank.

If one part of an ecosystem is changed, this may affect other living things in the ecosystem. For example, if a disease suddenly wipes out the plants in a pond, it might affect the fish and heron because they have less food to eat.

Adaptation

Living things are adapted to their habitats. This means that they have **special features** that help them to **survive**.

An African elephant, for example, lives in a hot habitat and has very large ears that it flaps to keep cool. A polar bear, on the other hand, lives in a cold habitat and has thick fur to keep warm.

It's not just animals that are adapted to their environment, plants are too. A cactus is well adapted for survival in the desert. They have long roots to collect water from a large area and a stem that can store water for a long period of time.

The animals and plants in one habitat are **suited** to live there and may not be able to survive in other habitats. When a habitat changes, the animals and plants that live there are affected.

Northern Ireland curriculum content

The World Around Us Age 8-11

At Key Stages 1 and 2, The World Around Us is presented as four inter-related strands that connect learning across geography, history and science and technology. The two that relate most strongly to the natural world and biodiversity are:

Interdependence

Interdependence statutory requirements

- how they and others interact in the world;
- how living things rely on each other within the natural world;
- interdependence of people and the environment and how this has been accelerated over time by advances in transport and communications;
- the effect of people on the natural and built environment over time.

Non statutory suggestions for what teachers should cover include under interdependence include:

- Local habitats, for example, woodland, lake, river, seashore, protected area or pond. (geography)
- The relationship between animals and plants in a habitat. (science and technology)
- The main stages in the lifecycle of some living things. (science and technology)

Progression Guidance

- Animals and plants together form ecosystems, and interdependence within systems is essential.
- Human influence can have a positive or negative impact on earth's ecosystems
- Animals and plants can be influenced over time by seasonal or environmental change

Place

Place statutory requirements

- how place influences the nature of life;
- ways in which people, plants and animals depend on the features and materials in places and how they adapt to their environment;
- features of, and variations in places, including physical, human, climatic, vegetation and animal life;
- our place in the universe;
- change over time in places;
- positive and negative effects of natural and human events upon a place over time.

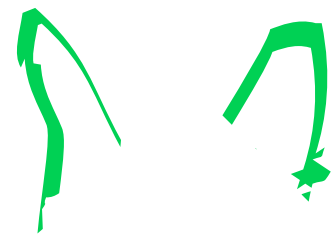
Progression Guidance

- The earth's structure determines the nature of habitats and availability of resources.

Key Scientific Ideas at Primary Level

- Living things need energy in order to survive. Life processes consume energy.
- There is a large variety of plant and animal life, and this is very important in our world. This is called biodiversity.
- Animals and plants share our world and we need to respect and care for it in order to survive.
- A way to categorise different sorts of living things is to describe the similarities and differences between organisms.
- Our environment is made up of many interconnected systems. Parts of these systems can be described as smaller systems.
- Living things have to change their behaviour over time in order to survive.
- Within an environment living things rely on each other to survive. Sometimes these relationships also involve competition.
- The human body interacts with the surrounding environment, which can be good or bad for our health.
- In our world resources are limited, so changes in one part of a system are likely to result in effects in other parts as well.

From [Science and technology within the world around us progression guidance](#)



Scotland

Sciences Planet Earth & Biological Systems curriculum knowledge

From BBC Bitesize:

[Click to view full
BBC Bitesize page](#)

Classification

Animals can be divided into groups or 'classified' by looking at the **similarities** and **differences** between them.

Animals are divided into two main groups. Animals that have a **backbone** are called **vertebrates**. Animals that don't have a **backbone** are called **invertebrates**.

Vertebrates and invertebrates are divided into smaller groups. Vertebrates, for example, are divided into fish, amphibians, reptiles, birds and mammals.

There are many different groups of invertebrates too. They include invertebrates which have soft bodies such as jellyfish, worms and molluscs (like slugs and squids). There are also groups of invertebrates with hard bodies, such as insects, crustaceans and spiders.

Life cycle

All animals, including humans, are born, they get older and bigger and some will go on to have children. In the end, all animals die. We call this a life cycle.

Animals are small when they start life. Over time they grow bigger and their bodies change. When they are grown up, they might reproduce and have young animals of their own. These children will get older and may eventually also have children too, and so the life cycle keeps going!

Food chain

A food chain shows how plants and animals get their energy.

Producers and consumers

A food chain always starts with a **producer**. This is an organism that makes its own food. Most food chains start with a green plant, because plants can make their food by **photosynthesis**. A living thing that eats other plants and animals is called a **consumer**.

Predators and prey

A predator is an animal that eats other animals. The animals that predators eat are called prey. Predators are found at the **top** of a food chain.

Ecosystems

A community of **animals, plants** and **microorganisms**, together with their **habitat** is called an **ecosystem**.

For example, a pond ecosystem may consist of a pond habitat, inhabited by aquatic plants, microorganisms in the mud at the bottom, fish in the water and a heron on the bank.

If one part of an ecosystem is changed, this may affect other living things in the ecosystem. For example, if a disease suddenly wipes out the plants in a pond, it might affect the fish and heron because they have less food to eat.

Adaptation

Living things are adapted to their habitats. This means that they have **special features** that help them to **survive**.

An African elephant, for example, lives in a hot habitat and has very large ears that it flaps to keep cool. A polar bear, on the other hand, lives in a cold habitat and has thick fur to keep warm.

The animals and plants in one habitat are **suited** to live there and may not be able to survive in other habitats. When a habitat changes, the animals and plants that live there are affected.

Habitats

- Polar habitats
- Ocean habitats
- Woodland habitats

Woodland habitats are green and shady. We find these in gardens, parks and the countryside. Lots of animals and plants are found here.

- Rainforest
- Urban habitats

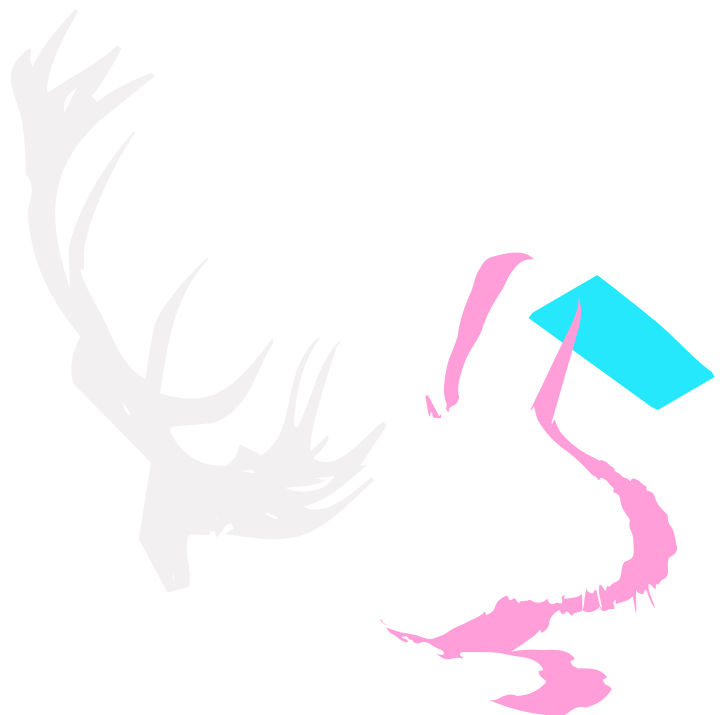
Urban habitats are in towns and cities. They are often busy and noisy.

- Desert habitats
- Coastal habitats

Coastal habitats are the places where the land meets the ocean. They can have rocky cliff edges, sandy beaches and rock pools. There are different plants and animals that are suited to live there.

- Pond habitats

In the UK, there are lots of ponds. We find ponds in parks, in the countryside and even in our gardens. Pond habitats are the home to lots of different animals and plants, like water lilies, frogs and ducks.



Scotland Sciences curriculum content Planet Earth & Biological Systems Age 9-11

Planet Earth: Biodiversity and interdependence

Experiences and Outcomes:

I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction.

Benchmarks

- Classifies living things into plants (flowering and non-flowering), animals (vertebrates and invertebrates) and other groups through knowledge of their characteristics.
- Begins to construct and use simple branched keys which can be used to identify particular plants or animals.
- Identifies characteristics of living things and their environment which have contributed to the survival or extinction of a species.
- Describes how some plants and animals have adapted to their environment, for example, for drought or by using flight.

Experiences and Outcomes:

I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs. I have contributed to the design or conservation of a wildlife area.

Benchmarks

- Describes how energy flows between plants and animals in more complex food chains and webs and ecosystems, using vocabulary such as 'producers', 'consumers' and 'herbivore'.

Biological systems: Inheritance

Experiences and Outcomes:

By investigating the lifecycles of plants and animals, I can recognise the different stages of their development.

Benchmarks

- Identifies and compares the two distinct groups of animals – vertebrates and invertebrates.
- Researches the lifecycles of the five main types of vertebrates including fish (spawn), birds (eggs which are rigid but fragile), amphibians (spawn and metamorphosis), reptiles (leathery shelled eggs) and mammal (live young), and communicates findings using a range of media.
- Compares the lifecycles of some invertebrates, for example, ladybird and spider.





Wales

Science and Technology Being Curious and The world around us is full of living things Curriculum knowledge

From BBC Bitesize:

Classification

Classification is putting things into **groups**. Living things can be divided into these groups or 'classified' by looking at similarities and differences between the way they look and behave.

Classification keys

A key is a **set of questions** about the characteristics of living things. The answer to the first question gives you another question to answer and so on. As you answer more questions you narrow down your living thing until eventually the last question tells you what it is.

Animals

Animals are divided into two main groups. Animals that have a **backbone** (spine) are called **vertebrates**. Animals that don't have a **backbone** are called **invertebrates**.

Vertebrates and invertebrates are divided into smaller groups. Vertebrates are divided into five groups:

- **fish**
- **amphibians** (like frogs and toads)
- **reptiles** (like snakes and crocodiles)
- **birds**
- **mammals** (like humans, dogs and dolphins)

There are many different groups of invertebrates too. They include invertebrates which have:

- **soft bodies** such as jellyfish, worms and molluscs (like slugs and squids).
- **hard bodies** such as insects, crustaceans and spiders.

Changing environments

Our environments are always changing. Sometimes these changes are natural and can't be avoided, but humans are also causing some changes that aren't good for the planet.

Deforestation: Humans are changing the **environment** in lots of different ways. These changes often affect the living things in them. **Deforestation** means cutting down trees. At the moment we are cutting down more trees than we plant. It takes some forests hundreds of years to grow and for animals and plants to live there.

[Click to view full
BBC Bitesize page](#)

Development	Reasoning
Farming	Farms produce food.
Mining	Coal, metals and stones are important to build houses, roads and cars.
Landfill	Humans are making more waste than ever. If it can't be recycled, it gets burnt or put in big holes in the ground.
Urban	Many towns and cities are spreading outwards so more people can live there.

All these developments are important - but it is equally important that our environments and their living things are looked after. **This is called conserving.**

Changes to environments can cause danger to animals and plants that live in them, including us.

Lifecycles

A lifecycle is the different stages of life for all living things, including humans.

Stages in a lifecycle

There are normally four major events in the lifecycle of animals: birth - growth - reproduction – death

Most amphibians go through **metamorphosis** during their lifetime.

Food chains

All living things need to consume something like food for energy. Because of this, all living things are part of a food chain.

- A herbivore is an animal that only eats plants
- An omnivore eats plants and animals
- A carnivore only eats animals
- An insectivore eats some animals such as insects and worms

Plants are at the beginning of most food chains. They are called producers because they make their own food.

Any animal which eats a producer is called a primary consumer. All primary consumers are herbivores because they only eat plants.

Secondary consumers eat primary consumers. All secondary consumers are predators because they kill and eat other animals. The animal at the top of the food chain is called the top predator.

Changes in food chains affect all the living things in them. All living things in a food chain depend on each other.

Ecosystems

A community of **animals, plants** and **microorganisms**, together with their **habitat** is called an **ecosystem**.

For example, a pond ecosystem may consist of a pond habitat, inhabited by aquatic plants, microorganisms in the mud at the bottom, fish in the water and a heron on the bank.

If one part of an ecosystem is changed, this may affect other living things in the ecosystem. For example, if a disease suddenly wipes out the plants in a pond, it might affect the fish and heron because they have less food to eat.

Adaptation

Living things are adapted to their habitats. This means that they have **special features** that help them to **survive**.

An African elephant, for example, lives in a hot habitat and has very large ears that it flaps to keep cool. A polar bear, on the other hand, lives in a cold habitat and has thick fur to keep warm.

The animals and plants in one habitat are **suited** to live there and may not be able to survive in other habitats. When a habitat changes, the animals and plants that live there are affected.

Habitats

- Polar habitats
- Ocean habitats
- Woodland habitats

Woodland habitats are green and shady. We find these in gardens, parks and the countryside. Lots of animals and plants are found here.

- Rainforest
- Urban habitats

Urban habitats are in towns and cities. They are often busy and noisy.

- Desert habitats
- Coastal habitats

Coastal habitats are the places where the land meets the ocean. They can have rocky cliff edges, sandy beaches and rock pools. There are different plants and animals that are suited to live there.

- Pond habitats

In the UK, there are lots of ponds. We find ponds in parks, in the countryside and even in our gardens. Pond habitats are the home to lots of different animals and plants, like water lilies, frogs and ducks.

New Welsh Curriculum content Being Curious and The world around us is full of living things Age 8-11

Statements of what matters (mandatory)	Descriptions of Learning linked to each statement of what matters
Being curious and searching for answers is essential to understanding and predicting phenomena.	<p><u>Progression step 2 (age 5-8)</u></p> <ul style="list-style-type: none"> • I can recognise that what I do, and the things I use, can have an impact on my environment and on living things. • I can explore relationships between living things, their habitats and their life cycles. <p><u>Progression step 3 (age 8-11)</u></p> <ul style="list-style-type: none"> • I can understand how my actions and the actions of others impact on the environment and living things.
The world around us is full of living things which depend on each other for survival.	<p>(same Descriptions for being curious and world around us)</p> <p><u>Progression step 2 (age 5-8)</u></p> <ul style="list-style-type: none"> • I can recognise that what I do, and the things I use, can have an impact on my environment and on living things. • I can explore relationships between living things, their habitats and their life cycles. <p><u>Progression step 3 (age 8-11)</u></p> <ul style="list-style-type: none"> • I can describe how living things compete for specific resources and depend on each other for survival. • I can describe the features of organisms and recognise how they allow them to live, grow and reproduce for survival in their environment.