

# Creating Futures

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## Lesson 6

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# Biodiversity and climate change



### Outline

Children engage in a sorting and ranking exercise to explore:

- how plants and animals are valued;
- their values in relation to plants and animals; and
- the consequences of climate change for biodiversity.



### Key Question: Why do we care about climate change?



### Key points of learning relating to climate change

- The **environment is important** to humans for different reasons, including survival as well as economic, cultural and aesthetic reasons.
- Different people value the environment in different ways. Some people recognise it as **essential for human life** (instrumental), others think it is important in its own right (intrinsic).
- Living things are **dependent on one another**.
- **Climate change impacts on different species**, which in turn impacts on other species and on human life.



### Curriculum integration

	Strand	Strand Unit
Science	Living things	Plant and animal life
	Environmental awareness and care	Environmental awareness Caring for the environment
SPHE	Myself	Self identity
	Myself and the wider world	Developing citizenship
Geography	Natural environments	Weather, climate and atmosphere
	Environmental awareness and care	Environmental awareness Caring for the environment
Geography	Developing cognitive abilities through language	Oral language



## Resources

- Which to Save?, *one per class.*
- Part of Nature Sheets, *one part of nature per group (seven groups), a copy for each person in the group.*
- Parts of Nature Cards, *cut up, one set per group (seven groups).*
- Climate Change Predictions Sheet, *one set per group (seven groups).*
- Green Heart Sheets, *one per pupil.*
- Reasons for Valuing Nature Statements, *one set per class.*



## Other resources

Paper and arts materials.



## LESSON PLAN

### 1. The class discusses why we care about climate change and the environment

There may be a question related to biodiversity on the **climate change learning wall** which could be referred to here.

### 2. Children explore the value of different parts of nature

Children listen to the scenario **Which to Save?**

Working in seven groups, each group is given a part of nature and their corresponding **Part of Nature Sheets** and prepares an argument as to why their part of nature should be saved first.

Each group presents their argument to the class.

### 3. Children rank the different parts of nature

In their groups, children are given a set of the **Part of Nature Cards**. They decide in which order to save the parts of nature by ranking their cards.

Children discuss their choices as a class.

The class votes on which part of nature to save first.

#### Class Discussion Questions

Why do we value different parts of nature?

What makes some parts of nature more valued than others?

In what ways are living things important to human life?

### 4. Children predict the consequences of climate change for biodiversity

In their groups, children look again at their **Part of Nature Sheets and Cards**.

From looking at the changes in the clouds on the **Climate Change Predictions Sheet**, what may happen to their part of nature?

Can they predict some of the possible consequences of climate change relating to the different parts of nature?



## LESSON PLAN (continued)

### 5. Children think of different parts of nature in their own lives

Using the **Green Heart Sheets**, children visualise a part of nature they value because it is fun – this might be a place, an animal or a plant.

Then a part of nature they value because it is beautiful.

Then a part of nature they value because it is helpful.

Children share their thoughts as a class.

Each child chooses one of their visualised parts of nature and uses the **Green Heart Sheets** to explore their reasons. They draw the part of nature in the heart and list the reasons they value it around the heart.

### 6. Children think about the main reason they value nature

Using the **Nature Statements**, positioned in order around the classroom, the children stand next to the card that reflects their main reason for valuing nature.

Children discuss their different reasons for valuing the environment.

Who values parts of nature because they are important to humans?

Who values parts of nature because they are living things and important in their own right?

### 7. Children review their climate change learning wall

Can any of the questions be answered now?

Can any new knowledge about climate change be added to the wall?

Can any new questions be added?

## Which to Save?

Imagine a gas had been released into the atmosphere that is deadly for seven different parts of nature. These parts of nature are: salmon, rice plants, polar bears, bees, Irish bogs, coral reefs and cocoa trees.

There is an antidote for the gas which will stop the gas killing these parts of nature. However, there is not enough of the antidote. You have to decide which part of nature should be saved first.

## Part of Nature: Salmon



Salmon start life in rivers but then travel to the sea to feed and grow. They return to the river to spawn their young. Young salmon eat insects, invertebrates and plankton, and adult salmon eat other fish, squid, eels and shrimp.

Salmon live in the Atlantic and Pacific Oceans as well as in some lakes.

Some countries make a lot of money by catching or farming salmon and selling it for food. In Ireland, for example, 11,000 people work in the fishing industry. But this species is also an important food for animals. It is eaten by seals, whales, otters, bears and birds. Salmon are also important in a lot of cultures and are associated with knowledge in Irish culture.

There are many different types of salmon and they all look different. Some salmon are silvery-blue in colour, while some have black spots on their sides. Still others have bright red stripes. Most species are one colour when living in fresh water, then change colour when they are in salt water.

## Part of Nature: Coral Reef



Coral reefs are made of tiny animals called polyps. Many plants, fish, and other creatures live in a coral reef. Coral reefs are some of the most diverse ecosystems in the world. They are home to about 25% of all marine life!

Coral reefs have been around for millions of years. The reefs grow best in warm, shallow, clear, sunny and moving water. However, they grow very slowly and are sensitive to changes in temperature. The reefs we see today have been growing over the past 5,000 to 10,000 years.

The Great Barrier Reef is the largest coral reef. It stretches for over 2,600 kilometres off the northeast coast of Australia. People travel long distances to visit the reef or to go diving. This makes a lot of money for Australia.

## Part of Nature: Rice



Rice is the main food eaten in most countries in the world. More than half of all the people in the world eat rice every day. Originally rice came from Asia and parts of Africa, but now it is eaten nearly everywhere around the world.

Rice comes from a particular type of grass. Rice is the seed part of the grass. The rice plant can grow to between one and two metres tall. It comes in different shapes, colours and sizes.

Rice can be grown in most places but needs a lot of water to grow. It can be grown in places where other plants cannot survive. However, it requires a lot of work. It also grows for many months of the year, although this may change if the earth gets hotter.

Rice is used in many different dishes around the world. Long-grain rice is used to accompany vegetables, meat or fish. Medium-grain rice becomes sticky when it is cooked, and is used in dishes like sushi and risotto as well as sweet dishes. Short-grain rice is often used for rice pudding.

## Part of Nature: Bees



Bees are a type of flying insect. They make honey and wax but their most important job is to take pollen from one plant to another. When plants flower, bees visit the flowers to get food. As they fly from plant to plant they carry the pollen from one plant to another. This enables the plants to produce fruit and new plants.

Certain plants rely on bees to carry their pollen in order to fruit or produce more plants. These plants flower at exactly the same time each year so that bees are ready to take pollen from one plant to another. Much of our food depends on bees carrying pollen between plants.

Bees are also food for lots of different kinds of birds and dragonflies. Beekeepers keep bees both to help pollinate their crops and to produce honey.

Bees live in colonies. A colony generally contains thousands of worker bees with one queen bee. Worker bees cooperate to find food and use a pattern of 'dancing' to communicate information to each other.

In cold climates, bees stop flying when the temperature drops below about 10°C and crowd into the central area of the hive to form a winter cluster. The worker bees huddle around the queen bee at the centre of the cluster. During winter, they consume their stored honey to produce body heat.

## Part of Nature: Cocoa Trees



Cocoa trees are evergreen and are originally from the Amazon Basin. They need a lot of rainfall and cannot survive in dry weather. They are happy in the shade and so are suited to growing in dense forests in places like South America.

Cocoa trees grow pods which start off green and then turn yellow, red or purple when they are ripe. The pods are thick and oval in shape and can grow to about the size of a rugby ball. The pods contain cocoa beans and a sweet pulp. Animals eat the pulp and the seeds.

The cocoa pods are used to make chocolate. Humans have eaten cocoa for hundreds of years, and people living in the rainforest use different parts of the cocoa tree to make food and medicine. Cocoa is now an important crop. It is farmed mainly in West Africa, South and Central America and South-East Asia, and is sold to people all around the world. Cocoa plants are often grown on small family-run farms and picked by hand. Between 40 and 50 million people depend on cocoa farming for their income.

Cocoa trees originally come from tropical rainforests. They are one of the thousands of plants and animals living there. Tropical rainforest trees and plants remove carbon dioxide from the atmosphere and store it in their roots, stems, leaves and branches. They also clean water.

## Part of Nature: Irish Bog



A bog is a type of wetland made from the gradual build up of decaying plants. Bogs are found in colder climates that get a lot of rain. Bogs are home to many plants and animals, and are important places for these plants and animals to live.

Bogs are also a great water store. Rainwater can be stored here, which prevents flooding. Bogs also hold carbon, reducing the amount of carbon given off into the atmosphere.

Bogs are a source of peat. Peat was widely used to heat homes in the past and is still used today.

Ireland has some of the most important bogs in the world. The bogs were formed in Ireland over 10,000 years ago. Artefacts from the past have been found in the bogs, giving us insight into the past. The bodies of people who lived thousands of years ago have been found in Irish bogland.

## Part of Nature: Polar Bears



The polar bear is a large bear that lives in the Arctic. The polar bear is built to live in cold temperatures and to be able to move across snow, ice and open water.

Polar bears are not normally aggressive and will often run away from other animals instead of fighting them. They rarely attack humans unless provoked.

In general, adult polar bears live by themselves. However they have often been seen playing together for hours. They are believed to have friendships with one another. Cubs are especially playful. Polar bears make different noises including bellows, roars, growls, chuffs and purrs.

Most polar bears are born on land but spend most of their time at sea. A polar bear's favourite food is seals. They hunt on the ice and swim between ice sheets.

For thousands of years, the polar bear has been very important to the Arctic peoples, and polar bears remain important in their cultures.

## Part of Nature Cards



Cut out all cards



### Salmon

Some countries make a lot of money by catching or farming salmon and selling it for food. Salmon is also an important food for animals. It is eaten by seals, whales, otters, bears and birds. It is also important in a lot of cultures. It is associated with knowledge in Irish culture.



### Coral reefs

Coral reefs are home to 25% of marine life. Some of these plants and animals that live in the coral reefs are eaten by people. People travel long distances to visit the reef or to go diving. Reefs make a lot of money for the countries where they live. Coral is very sensitive to changes in temperature and doesn't like seawater getting hotter.



### Rice

Rice is the main food eaten in most countries in the world. More than half of all the people in the world eat rice every day. Rice grows in wet places where other plants cannot survive. It is able to grow for many months of the year, although this could change if the earth gets hotter.



### Bogs

Bogs store lots of carbon and prevent this carbon being released into the atmosphere. They also store water to help prevent flooding. They are home to many rare plants and animals and are one of the most important parts of the Irish environment. Certain species rely on the wet conditions of the bogs and could not live in other habitats. However, it can be easily damaged, and is cut for fuel.

## Part of Nature Cards



Cut out all cards



### Bees

When plants flower, bees visit the flowers to get food. As they fly from plant to plant they carry the pollen from one plant to another. This enables the plants to produce fruit and new plants. Certain plants rely on bees to carry their pollen in order to fruit or produce more plants. These plants flower at the exact same time of year so that bees are ready to take pollen from one plant to another. Much of our food depends on bees. They are also important because they are food for lots of different kinds of birds and dragonflies. They also make honey and wax.



### Cocoa trees

Cocoa Trees produce pods from which we get the key ingredient for chocolate. They are an important crop, with farmers in equatorial regions growing and selling cocoa to others all around the world. People living in the rainforests, where cocoa plants grow, have used different parts of the cocoa tree for hundreds of years to make foods and medicines. Cocoa trees grow in rainforests, which are called the lungs of the Earth because they take in and trap carbon dioxide.



### Polar bears

Polar bears live in the Arctic. They are the world's largest bear. They have adapted to live in the cold. They are able to run fast for a long time during the summer. They eat seals and also eat birds and eggs. Polar bears hunt on ice and swim between ice sheets.

# Climate Change Predictions

We can see that certain changes are already starting to happen as a result of climate change. Here are some changes expected as a result of climate change.

How will these changes affect the parts of nature we have looked at?

Make three predictions that might happen to the parts of nature as a result of climate change.

Plants may open and flower earlier in the season.



Sea temperature is likely to rise as a result of climate change.



Parts of Ireland are likely to get warmer and drier as a result of climate change.



Ice sheets will continue to melt.



My prediction .....

**Example:** Plants may open and flower before bees are ready to travel from plant to plant; this means when plants open there may be no bees to carry the pollen and help plants produce fruit and create new plants.

My prediction .....

My prediction .....

My prediction .....

# My Green Heart

A part of nature I find  
**FUN...**



A part of nature I find  
**BEAUTIFUL...**



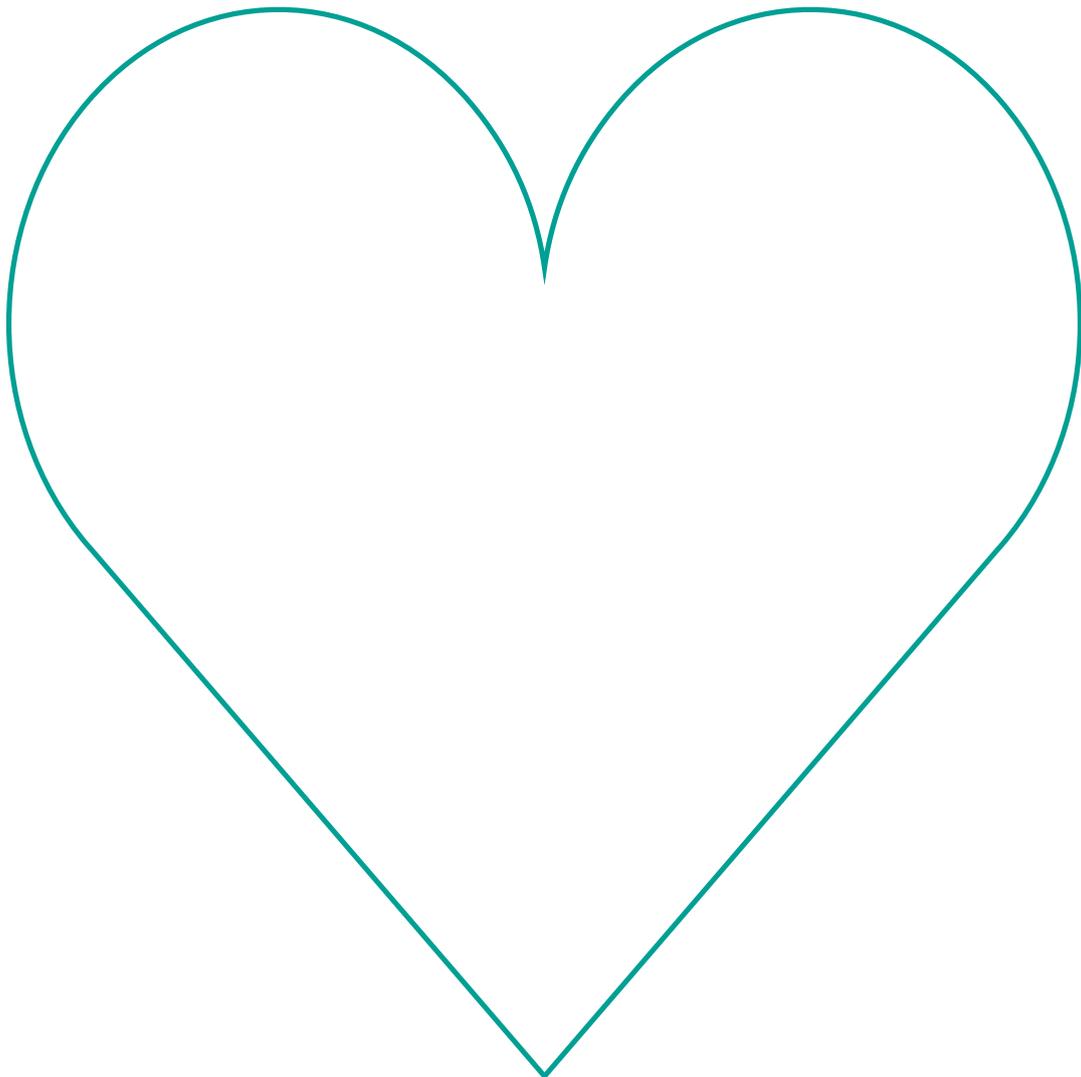
A part of nature I find  
**HELPFUL...**



The part of nature I most value is...

**Draw this part of nature in the green heart.**

**Write the reasons you value this part of nature around the outside of the heart**



## Nature Statements

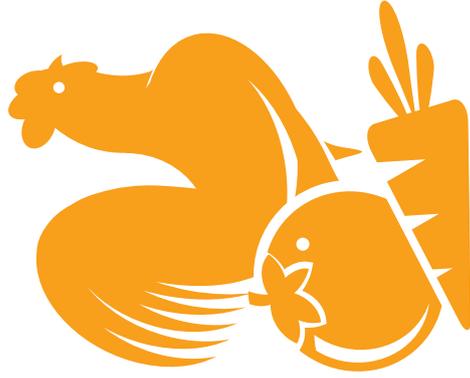
I value parts of nature because...



...they make money  
and create jobs.

## Nature Statements

I value parts of nature because...



...they are food  
for humans.

## Nature Statements

I value parts of nature because...



...they create  
clean air.

## Nature Statements

I value parts of nature because...



...they are our home.

## Nature Statements

I value parts of nature because...



...they look beautiful.

## Nature Statements

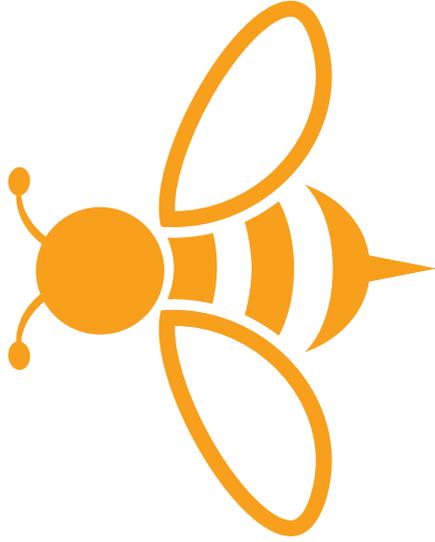
I value parts of nature because...



...they are  
living things.

## Nature Statements

I value parts of nature because...



...they are necessary  
for other plants and  
animals.

## Nature Statements

I value parts of nature because...



...everything is  
connected.