BLENHEIM PALACE
EDUCATION

This is an introduction to Blenheim's Sustainability Programme.

This module explores the present and the future of Blenheim, Blenheim Palace, and Blenheim Estates. Topics include Citizenship and Science.

*"Buy less, choose well, make it last. Quality rather than quantity: That is true sustainability."*

Vivienne Westwood

# Sustainability

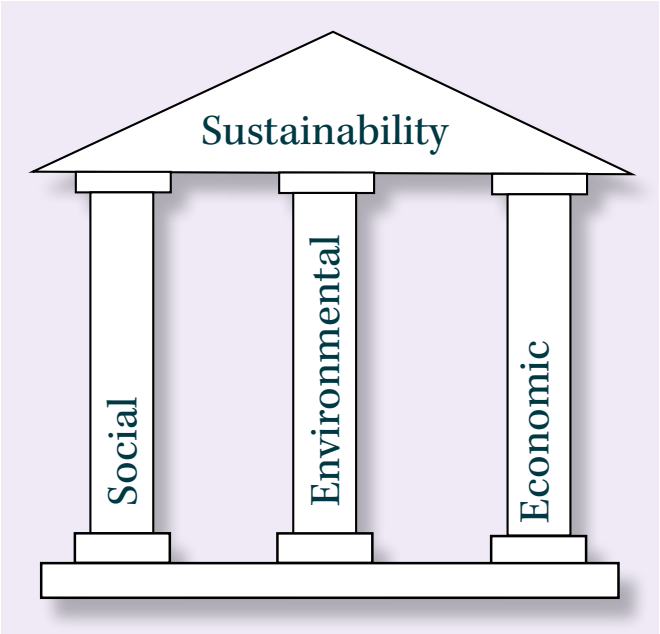
Sustainability is a new challenge that the entire world must face rapidly and seriously. It is a global concern, and citizens of the world have been, are, or will be affected by the consequences of inaction.

Q: What is **sustainability?**

A: It's the idea of caring about the world we live in and keeping it safe for future generations.

Q: Is sustainability about the environment?

A: Yes, it is about the **environment**, but it is also about **society** and the **economy.**




We currently live in a society where we use a lot of **resources** that the planet gives us, and at the pace we are using these resources, there will not be enough resources for future generations to live or survive.

Q: What are the **resources** we use?

A: The main natural resources that we use are **water, air, food** and **energy**.

- Without food, water and air, life on Earth would not be possible.
- Without energy, we would not have enough healthy food to eat, purified water to drink and clean air to breathe.

## Did you know?

If everyone in the world consumed as many natural resources as the average person in the UK, we would need three planets to support us. We only have one planet.

The current problem is that we **pollute the air and water** on an enormous scale; we **waste a lot of food**, and we are **using non-renewable energy.**

Q: How do we pollute the environment?

A: The main cause of **air pollution** is the emission of greenhouse gases. For example, most of the vehicles used in the world run on petrol or diesel and they emit **carbon dioxide** into the air. Carbon is a necessary gas for life on Earth, but there is just too much of it in the atmosphere.

A: Main cause of **water pollution** is the disposal of pollutants. For example, many large industrial companies discharge their waste into the water as it is the quickest and cheapest way of getting rid of **toxic elements** and **chemical waste** in their production processes.

Pollution and waste are human choices.

# Energy

**The use of non-renewable energy sources contributes to pollution.**

Q: What are the sources of **non-renewable** energy?

A: All fossil fuels like oil, natural gas and coal. These sources are called primary energy.





Q: Where do we use these non-renewable energy sources?

A: Transport, heating and electricity.

We use primary energy to generate secondary energy:

- We use gasoline and diesel fuels to run our vehicles (cars, lorries, ships, planes).
- We use oil, gas and coal to heat our homes (central heating and coal fires).
- We use all of these to operate appliances and machines in houses and factories (electricity).

## Did you know?

Coal is energy in solid state, and it comes from land remains.
Oil is energy in liquid state and gas is energy in gaseous state.
Both come from marine remains.

Q: Why the use of non-renewable energy is not sustainable?

A: Because they are quickly depleting. It is estimated that there will be less oil and gas by 2042 and there will be less coal by 2114.

Q: What are the sources of **renewable** energy?

A: The sun, the wind, and water.

- The SUN produces solar energy. Solar panels absorb the energy and transforms it into electricity.
- WIND makes turbines spin to create electricity.
- Flowing WATER released from dams creates hydroelectricity.





Q: Why should we be concerned about being sustainable?

A: Because all living creatures (humans, animals, and plants) are part of the **food chains**. If we choose to continue wasting and polluting natural resources, the food chains will collapse. When one species becomes extinct, it affects the whole chain, and all living creatures will eventually cease to exist.

Q: How can we be more sustainable?

A: As responsible members of the community, we should better care for our environment. We must stop polluting the planet and wasting the planet's resources. We cannot stop using resources, but we can **refuse**, **reduce**, **reuse** and **recycle**.

## Climate change

**Climate change** is a natural phenomenon that occurs repeatedly through human history. It can be a period of cooling down or a period of warming up.

Q: Do you know a cooling down period?

A: The Ice Age about 20,000 years ago. Pre-historic animals like the woolly mammoths, the sabre-toothed tigers and the dire wolves became **extinct** during this period.

Q: Why did these animals become extinct?

A: Because they had **no food to eat**. Everything was cold and frozen.

Climate change affects **food production** and **food accessibility** around the world. The current climate change is a warming up period.

Q: How is climate change affecting food production and accessibility?

A: The warmer temperatures cause an imbalance in the environment and the consequences are **floods, mudslides, wildfires, droughts,** etc.

Climate change causes more rainfall in some places and less rainfall in other places. Drought is when there is not enough water, and flood is when there is too much water. Too much water will kill plants and not enough water will kill animals.

Q: Have you noticed the effects of climate change in the UK?

A: There are heatwaves in the summer and there are periods of snow in the winter.

Q: How is climate change affecting the people in the UK?

A: Some farmers have lost their crops due to the heatwaves and floods. This means there is less food.

# Global warming

**Global warming** is also a natural phenomenon. The combination of climate change, global warming, and people's choices of polluting environment has worsened the situation.

Q: How is global warming a natural phenomenon?

A: There are natural gases in the air that we breathe. One of them is **carbon dioxide**. Human life could not exist without carbon dioxide, but the problem is that there is too much of it in the air.

Q: How is there too much carbon dioxide in the air?

A: Most vehicles we use emit a lot of carbon dioxide by burning fuel (petrol and diesel).

# Greenhouse gases

The **Greenhouse Effect** is an essential effect for life on Earth. It is the effect of natural gases being trapped in the atmosphere. Without this effect, the planet would be a very cold place, about -19°C!

Q: What are the natural gases in the atmosphere?

A: Nitrogen, oxygen, argon, carbon dioxide and other gases.

Q: If the greenhouse effect is so important to life, why is it a problem?

A: It is a problem because there is too much carbon dioxide. When there is too much carbon dioxide, it causes the temperature of the Earth to rise. When the temperature rises, it causes global warming.

Q: What are the consequences of global warming?

A: The consequences of global warming AND climate change are catastrophic for all living creatures on Earth. The extreme weather experienced all over the world affects **food chains**, **food production**, and **food accessibility**.

## There are four natural nutrient cycles that regulate food chains, food production and food accessibility: the **water** cycle, the **carbon** cycle, the **nitrogen** cycle, and the **phosphorus** cycle. Global warming and climate change affect these cycles.

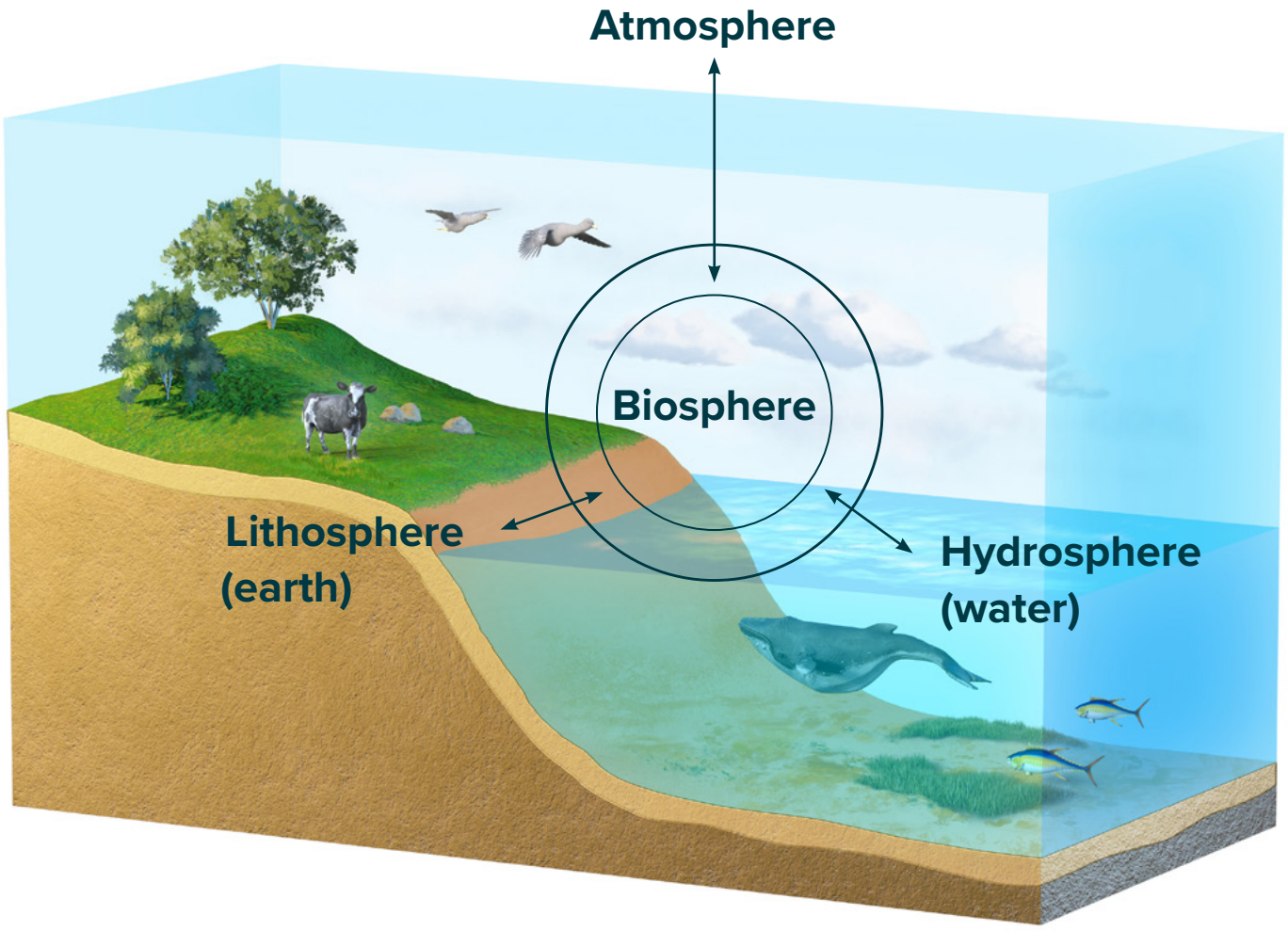
When the oceans warm up, it disrupts the water cycle:

- When there is too much condensation, water can cause hurricanes, typhoons, and cyclones.
- When there is too much precipitation, water can cause flooding and landslide.
- When there is too much evaporation, water can cause longer and deeper drought.

All these disruptions can cause sea levels to rise and forest fires to spread, and these will disrupt food production.

The four spheres of the Earth are: biosphere, atmosphere, hydrosphere, and lithosphere. Carbon should be absorbed in the biosphere by vegetation. That is when plants and trees absorb carbon through **photosynthesis** and store it in the lithosphere. It is called **sequestration**.

- When carbon is absorbed in the hydrosphere, it causes ocean acidification which affects the natural habitats of sea life. By consequence, it affects the bottom of the food chain.
- When carbon is trapped in the atmosphere, it causes air pollution. By consequence, it contributes to global warming.



# Blenheim's Sustainability Programme

## To address the waste problem, we **Reduce – Reuse – Recycle**

**We have reduced our electricity consumption.**

We have installed light sensors in the toilet areas. This means that the light will come on only when there is movement in the area.

**We have reduced our water consumption.**

We have installed touch sensors on our sinks. This means that the water will run when there is movement under the tap. We have also installed a dual-flush system on our toilets. This means that we can flush less water than with traditional flush systems.

**We have reduced the amount of waste sent to landfill.**

We have installed different bins around the Palace and the Park. We encourage staff and visitors to dispose of their rubbish in the appropriate bin: General Waste, Recyclable Waste and Organic Waste.

**We no longer use plastic cutlery or paper cups in the cafés.**

We use re-usable cups and recycled wooden cutlery.

## To address the pollution problem, we **Replace – Regenerate**

**We use less petrol and diesel vehicles.**

We have replaced many of our vehicles with electric cars and electric buggies.

**We are on a mission to plant a thousand trees.**

We are planting oak trees, cherry trees, walnut trees and beech trees. Oak trees are very good at absorbing carbon dioxide and keeping it away from us for a very long time.

**We are rewilding parts of the estate.**

We hope to encourage bees and butterflies to come and pollinate our flowers.

**We let the grass grow on some parts of the Estate.**

We leave a dripline zone (Root Zone) under trees where we don't cut the grass. It is a zone where rainwater falls off the leaves and nourishes the soil. This becomes a good area for pollinators.

At Blenheim, we have made our choices to become green and sustainable because we feel responsible for the communities living around us.

If you have any questions or comments about this self-led resource, please contact our Education Team at **education@blenheimpalace.com**

*"We do not inherit the Earth from our ancestors; we borrow it from our children."*

Native American proverb

Things to observe:














**Light sensors**
**Tap sensors**
**Food wrapping**
**Reusable cups**
**Wooden cutlery**
**Compost heap**
**Segregated bins**
**Estate electric cars, vans, buggies**
**Dripline zones under trees**
**Wildflowers**
**Young trees**