

# Knowledge Organiser

## World Studies

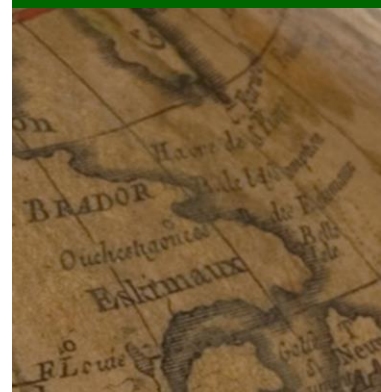
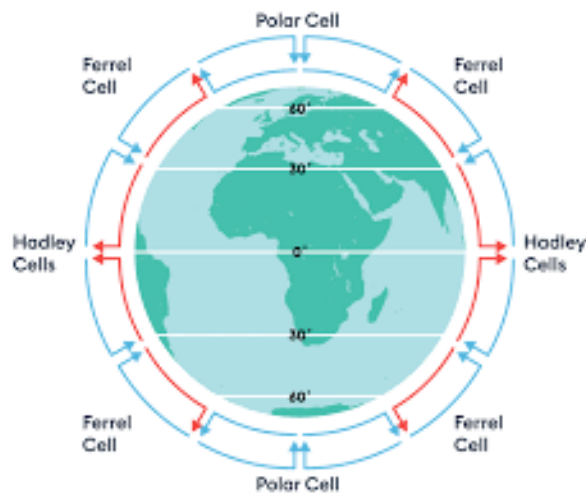
### KS4 Geography

### Topic 1: Hazards Earth EQ1

Name:

Class Teacher:

Big Question	Task	Due Date
3	Exam questions (set end of lesson 2)	
4	Retrieval questions ready for test Lesson 5	
6	Seneca & revision cards	



# Table of Contents

1. What are the characteristics of global biomes and where are they found?
2. What global factors impact the distribution of biomes?
3. How do local factors alter biome distribution?
4. What resources does the biosphere provide?
5. How does the biosphere regulate?
6. What is the link between population and resources?

# Exam structure & Case Studies

## Paper 1: Global Geographical Issues (37.5%)

- ❑ Topic 1: Hazardous Earth
- ❑ Topic 2: Development dynamics
- ❑ Topic 3: Challenges of an urbanising world

Written examination: 1 hour and 30 minutes, 94 marks.

Answer all questions

## Paper 2: UK Geographical Issues (37.5%)

- ❑ Topic 4: The UK's evolving physical landscape
- ❑ Topic 5: The UK's evolving human landscape
- ❑ Topic 6: Geographical investigations

Written examination: 1 hour and 30 minutes, 94 marks.

Answer all questions in Topic 4 and 5

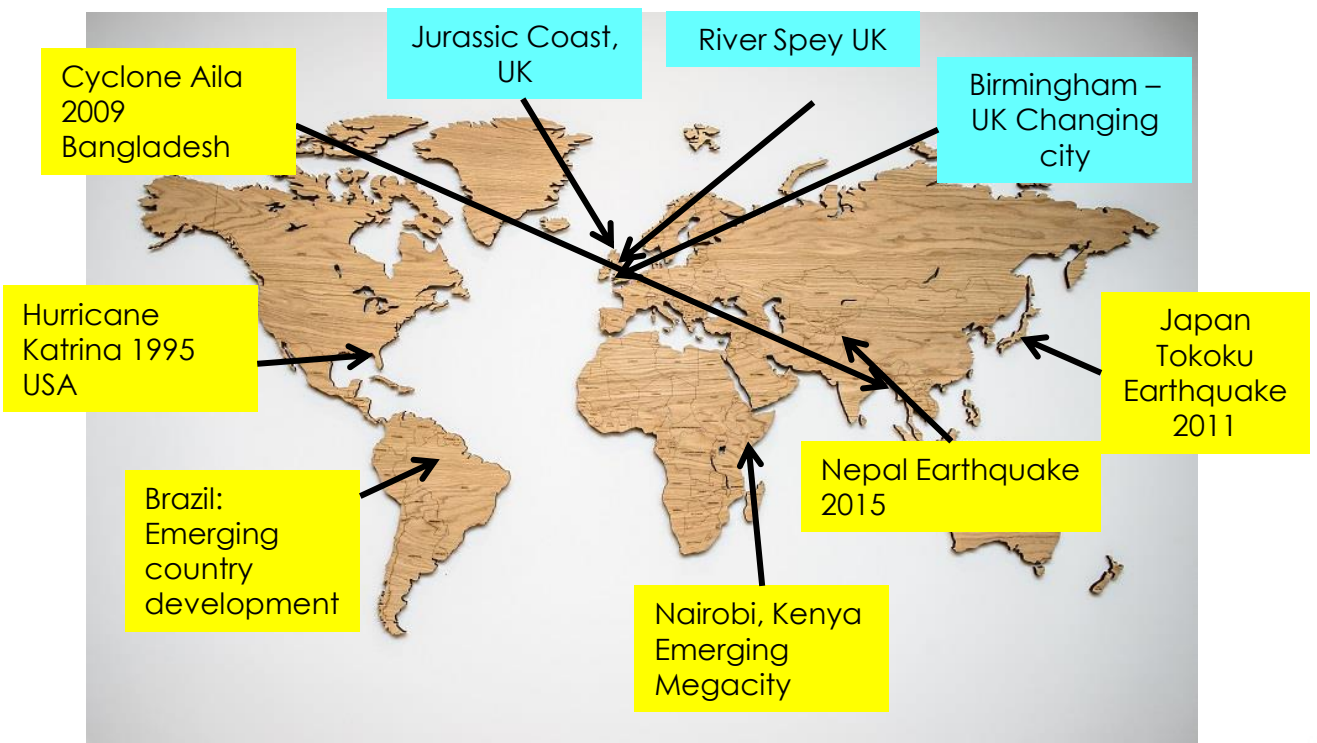
Topic 6: Answer Q 8 & Q10

## Paper 3: People and Environment Issues – Making Geographical Decisions (25%)

- ❑ Topic 7: People and the biosphere
- ❑ Topic 8: Forests under threat
- ❑ Topic 9: Consuming energy resources

Written examination, 1 hour and 30 minutes, 64 marks.

Answer all questions



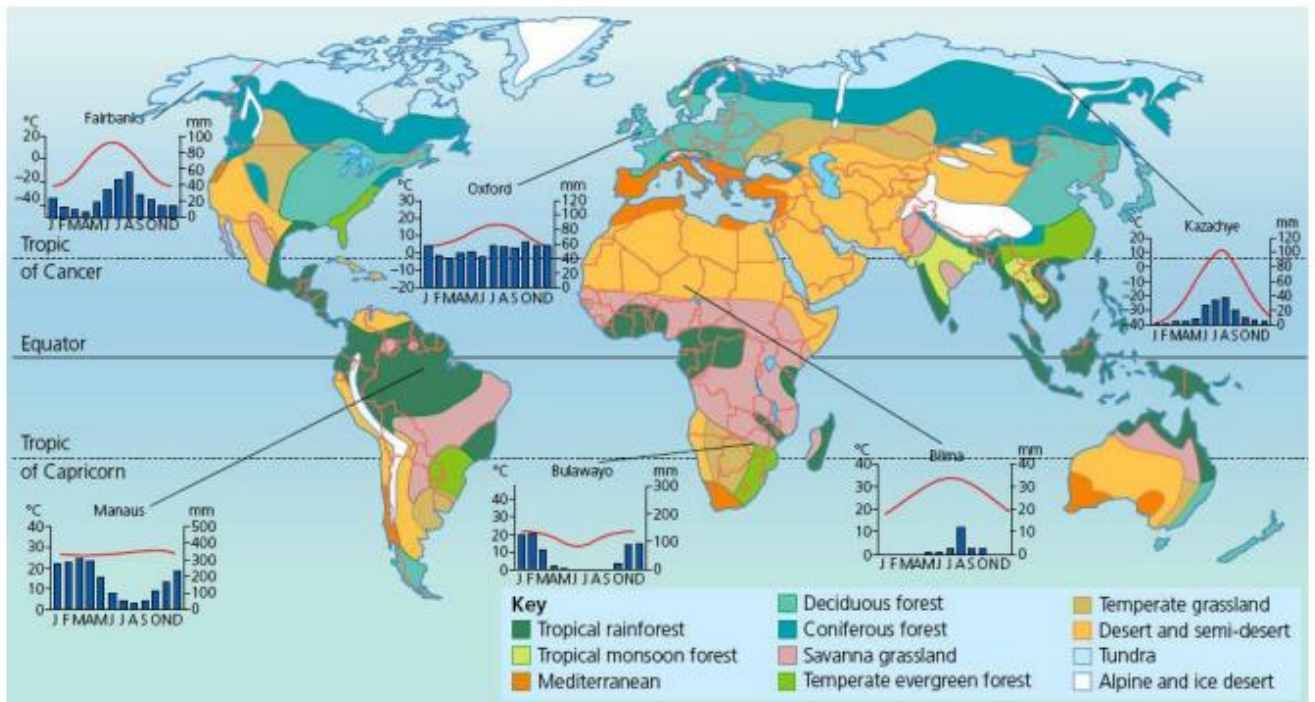
# BQ1: What are the characteristics of global biomes and where are they found?



**A biome** - A world-scale ecosystem e.g. the tropical rainforest.



**An ecosystem** is a system in which organisms interact with each other and with their environment.



# BQ1: What are the characteristics of global biomes and where are they found?

Global ecosystem	Location	Characteristics
Tropical rainforest	Close to the Equator	High temperatures and heavy rainfall associated with equatorial low pressure belt creates ideal conditions for plants to grow. Rainforests cover 6 per cent of the Earth's land surface. More than half the world's species of plants and animals live in this global ecosystem. A quarter of all medicines come from rainforest plants.
Desert	Roughly 30° north and south of the Equator	Deserts cover one fifth of the world's land surface. Hot deserts are associated with the sub-tropical high pressure belts. Sinking air stops clouds from forming, resulting in high daytime temperatures, low night-time temperatures and low rainfall. Plants and animals have to be well adapted to survive in these conditions.
Polar	Arctic/Antarctic	Cold air sinks at the north and south Poles, resulting in very low temperatures and dry conditions. The main polar regions are Antarctica and Greenland where temperatures can fall below -50°C.
Deciduous and coniferous forests	Roughly 50–60° north of the Equator	Deciduous trees shed their leaves in winter to retain moisture. Coniferous trees are cone-bearing evergreens, retaining their leaves to maximise photosynthesis during the brief summer months. The UK's natural vegetation is deciduous forest. Further north, for example in Canada and Scandinavia, coniferous forests dominate as they are better suited to colder climates.
Temperate grassland	Roughly 30–40° north and south of the Equator. Inland away from coasts, with hot summers and cold winters.	This includes the vast areas of grassland in North America (prairies) and Eastern Europe (steppes). These areas experience warm, dry summers and cold winters. Grasses can tolerate these conditions and this land is mainly used for grazing animals.
Mediterranean	Roughly 40–45° north of the Equator. Also isolated locations south of the Equator (South Africa, Western Australia)	Countries around the Mediterranean enjoy hot, sunny and dry summers, with mild winters. This is due to the pressure belts migrating slightly north and south during the year. Mediterranean vegetation includes olive trees and fruit trees, such as lemons and oranges. Other parts of the world have a similar climate, for example California (USA), South Africa and parts of Australia.
Tropical grassland (savanna)	Between 15–30° north and south of the Equator.	The tropical climate in these low latitudes is characterised by distinct wet and dry seasons. The dry season can be very hot and wild fires can break out. Violent thunderstorms can occur during the wet season. Large herds of animals graze on these grasslands, along with predators such as lions and leopards.
Tundra	From the Arctic Circle to about 60–70° north (e.g. Canada, Northern Europe). There are only very small areas of tundra in the southern hemisphere due to the lack of land at these latitudes.	Tundra is characterised by low-growing plants adapted to retain heat and moisture in the cold, windy and dry conditions. These regions are found in northern Canada and across Northern Europe. It is a fragile ecosystem, easily damaged by humans and threatened by developments such as oil exploitation and tourism. Animals such as reindeer are adapted to survive the cold.

# BQ2: What global factors impact the distribution of biomes?

+ In this section you will learn more about the effect of climate and local factors on vegetation.

<b>Key</b>
 Rainfall zones

## Temperature

Average temperature is the main factor affecting plant growth. Temperature gradually decreases as you move away from the Equator. As latitude increases, so temperature decreases.

In the tropics, the sun's rays are at a high angle in the sky for the whole year. These rays are concentrated over a smaller area than at the poles. Concentrated rays provide a lot of heat and sunlight. Plants grow well, so there is dense vegetation in the tropics.

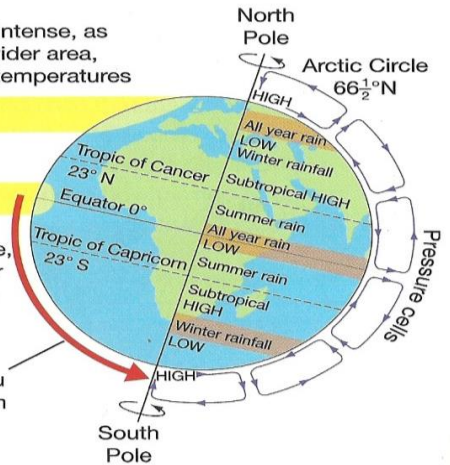
In polar areas, the sun's rays are less concentrated. The lack of heat and light limits vegetation growth. Plants are stunted and low growing.

Sun's rays less intense, as spread over a wider area, causing cooler temperatures

sun's rays

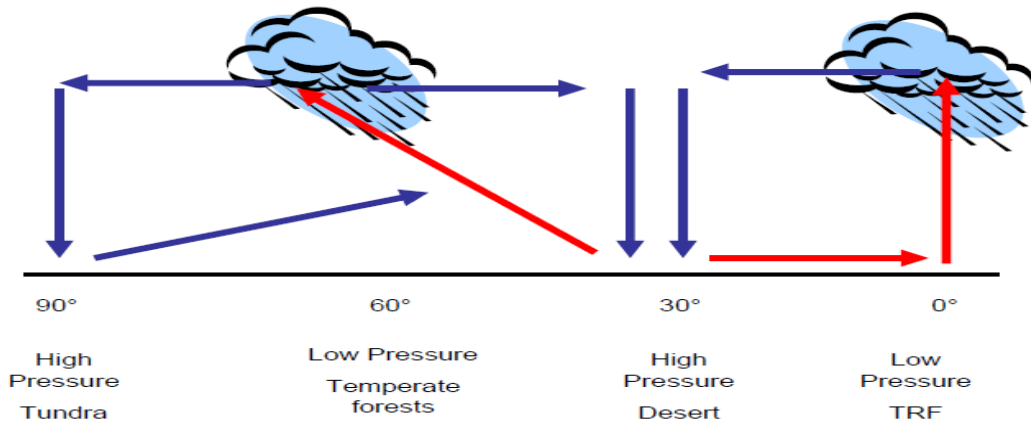
The sun's rays, are more intense, leading to hotter temperatures in the tropics

Temperatures decrease as you move away from the Equator



▲ How latitude affects temperature and rainfall patterns.

## Atmospheric Circulation



Precipitation happens where there are belts of low pressure around the world. In low pressure belts different air masses converge (meet) and warmer air is forced to rise because it is lighter and less dense than the colder, heavier air.

The two main areas where there is year-round rainfall are at the Equator and at the mid-latitudes e.g. the UK where warm air from the tropical regions meets colder air from the poles. Forest grow in both of these regions (tropical rainforest close to the equator and temperate deciduous/coniferous forests in the mid-latitudes)

In polar and desert areas high pressure zones occur causing dry conditions because air is sinking so clouds cannot form.

# **BQ3: How do local factors alter biome distribution?**

## **What is altitude and how does it affect biome distribution?**

Altitude is how high the land is above sea level – measured in metres. Temperatures fall by 0.6°C for every 100 metres increase in altitude. Tropical rainforest develops into coniferous forest and tundra as you gain in height and move inland. Tough grasses quickly replace trees on higher mountain slopes.

## **How does drainage affect biome distribution?**

Drainage affects local conditions and vegetation. The UK is often shown as being entirely temperate deciduous forest but in parts of Scotland, where soil conditions are especially wet, there are peat bogs rather than forests.

Similarly poorly drained land close to rivers is often occupied by swamps rather than grasslands or forests.

## **How does geology affect biome distribution?**

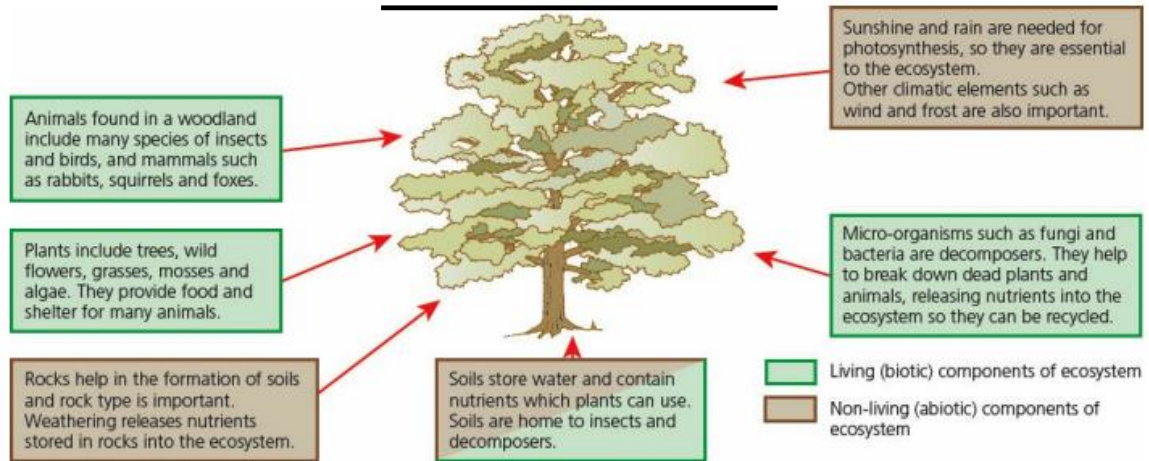
Geology affects local conditions and vegetation. Limestone bedrock. (the dominant rock type deep below the soil) creates dry soil conditions because percolating rainwater passes through it relatively easily. In the UK, trees are rarely found in limestone areas. In tropical rainforests, deciduous trees may replace evergreens where limestone is found

## **How do soils affect biome distribution?**

- ❑ Nutrient-rich soils are able to support more plant life, larger ecosystems, and more biodiversity.
- ❑ Drainage and the pH (acidity or alkalinity) of the soil will determine which kind of plants can live there.
- ❑ Which plants can live in an area will then determine which kind of animals can live in the area.

Areas of alkaline and acidic soil have very different vegetation types. Ash and beech trees are found in alkaline soils, and willow and birch trees are found in acidic soil.

# BQ3: How do local factors alter biome distribution?



## **Physical linkages between different parts of the ecosystem (animals eating the plants, for example)**

- ❑ Energy is provided by photosynthesis; only plants (primary producers) can turn the sun's energy into carbohydrate.
- ❑ Plants take in carbon dioxide from the atmosphere and release oxygen, whereas animals take in oxygen and breathe out carbon dioxide; nitrogen is also exchanged between the atmosphere, plants and soil.
- ❑ Energy flows along the food web, from plants to herbivores (primary consumers) and carnivores (secondary consumers), then to detritivores and decomposers (worm, bacteria, fungi) that consume dead plants and animals.
- ❑ Water (precipitation) moves through the soil, plants and animals and finally back into the atmosphere via respiration and evaporation.
- ❑ When plants and animals die, decomposition returns nutrients to the soil.
- ❑ Weathering of rock provides soil nutrients, e.g. phosphates and magnesium.

## **Chemical linkages (mild acids in rainwater speed up the decay of dead leaves, for example).**

### **Biological Weathering**

#### **Bio-physical weathering**

- ❑ Weathering is when rock gets broken into pieces without being eroded or transported.
- ❑ Bio-physical weathering is when tree roots grow into the joints of a rock and break the rock apart.
- ❑ Another example of this is when the paddock mollusc uses its teeth to grind holes in rock to create a home.

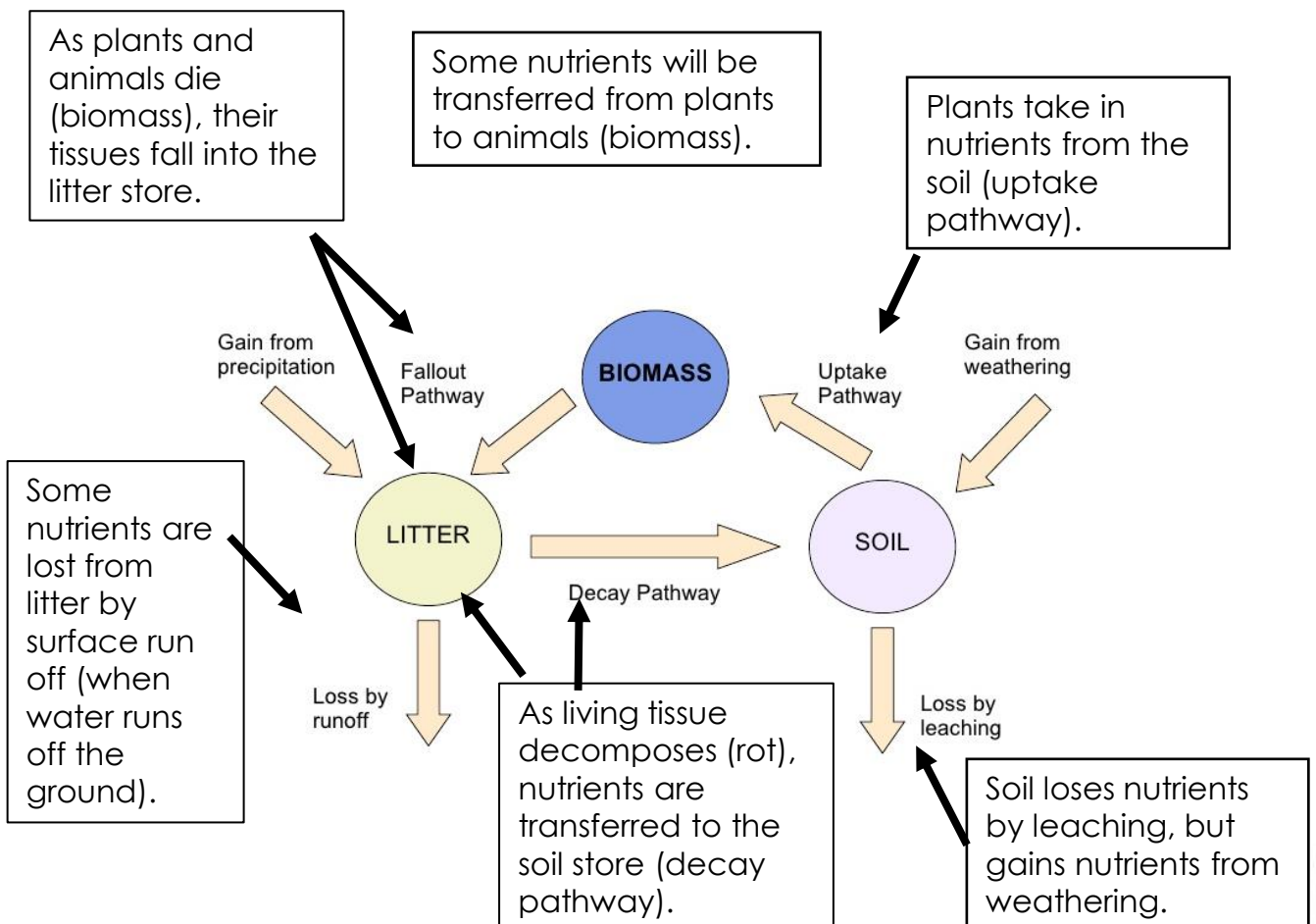
# BQ3: How do local factors alter biome distribution?

## **Bio-chemical weathering**

- ❑ This is when flora (plants) and fauna (animals) release acids which dissolve rock. Most plants do this when they decompose, producing humic acid.
- ❑ Seabirds can deposit vast amounts of excrement called guano on cliffs. Guano is very acidic and can dissolve rocks, especially limestone.

## **Photosynthesis and Respiration**

- ❑ Living things interact with the atmosphere in many ways.
- ❑ They can produce methane as a waste product of digestion (passing gas) or when plants decompose.
- ❑ They also interact through photosynthesis where carbon in the atmosphere is taken in by plants and oxygen is released.
- ❑ Respiration (breathing) does the opposite of photosynthesis and uses up oxygen and produces carbon dioxide.



# BQ4: What resources does the biosphere provide?

## Resources used by indigenous populations

The Efé are Pygmies found in the Democratic Republic of Congo.

- ❑ Pygmies relying on hunting and gathering for survival.
- ❑ Pygmy men hunt deer, pigs, hippos, and elephants. Some Pygmy groups use nets to hunt, while others use spears or bows and arrows.
- ❑ Forest resources, such as meat and honey, are traded to farmers for corn, salt, clothes, and iron tools.
- ❑ While the men are hunting, the women are busy collecting wild fruits, roots, insects, lizards, and shellfish. They also do most of the fishing.
- ❑ Pygmy villages are permanent, but campsites are used while the men are hunting. The villages consist of houses and cooking areas. Campsites, on the other hand, are located in the forest, so the sun does not always find them.
- ❑ Round huts are built and arranged in a circle. They are usually constructed with flexible poles set in the ground in a circular pattern. The poles are bent to where they come together at the top, then tied and covered with leaves. Leaves and bark are used to cover the poles.

Fuel resources from the biosphere	Medicine from the biosphere	Food from the biosphere	Building materials from the biosphere
Sustainable harvesting of fruits, berries and nuts	Quinine comes from bark and can be used a painkiller and as a cure for malaria.	Timber is a vital resource for construction.	Biofuels convert plant products to fuel through a range of different processes, e.g. bioethanol is made by fermenting crops like sugar cane.
Animal dung can be mixed with clay and straw to make bricks.	Natural vegetation can be replaced with crops like wheat, soya and rice.	St John's Wart is used to treat depression and poppies are the source of the painkiller morphine.	Straw, the dry stalks of cereal plants, is used for roofing and insulation.
Animal dung is dried and burnt as fuel.	Periwinkle is used to treat leukemia and Hodgkin's disease.		Fish and meat are part of the biosphere.

## BQ5: How does the biosphere regulate?

<b>Regulating the Atmosphere</b>	<b>Soil Health</b>	<b>Managing the World's Water</b>	<b>Other benefits</b>
The biosphere regulates the amount of carbon dioxide and oxygen in our atmosphere – through photosynthesis and respiration of living things	We cannot survive without the plants and crops grown in soils around the world	Plants store huge amounts of water and are a vital line of defence against flooding.	The biosphere and the plants and animals that live within them provide an important psychological and aesthetic benefit for people.
Without respiration producing carbon dioxide the Earth would cool down and there would be another glacial period	Most temperate soils, such as brown soils, would be infertile without the breakdown of leaf litter to add nutrients to the soil.	In 2016 severe flooding in Bangladesh was blamed on illegal logging along the floodplain.	Detoxification of human life and our waste that is produced.
Forests such as the Amazon Rainforest, breath out oxygen during the daylight hours	The decomposition is greatly aided by the biosphere, as earthworms churn up the soil and bacteria breaks it down.	Mangrove forests line many tropical coastal areas and soak up salt water without impacting the plants – when these are cut down, the impacts of flooding increases.	Allows a biodiversity of plants and animals to exist.
Trees and plants are a huge 'carbon sink' and store carbon that would otherwise dramatically impact our climate	Soils can filter water to remove impurities and waste.		

# BQ6: What is the link between population and resources?

## **Food**

- Over one billion people in the world are described as malnourished.
- A further two billion people suffer from malnutrition due to a poorly-balanced diet lacking in minerals and vitamins.

## **Energy**

- Energy consumption is increasing as the world becomes more developed and demand increases.
- The world's richest countries use far more than poorer countries in Africa and the Middle East.
- The Middle East supplies much of the world's oil yet its own consumption is relatively small.
- As Newly Industrialised Countries become more industrialised, the demand for energy will increase and patterns of energy trading will change.

## **Water**

- The imbalance in water supply is due mainly to variations in climate and rainfall.
- Rainwater needs to be captured and stored in reservoirs or taken from rivers or aquifers deep underground. All of these are very expensive and require high levels of investment.
- Many of the world's poorest countries, particularly in Africa, have a shortage of water.
- The UN estimates that by 2025 there will be 50 countries facing water scarcity.

# BQ6: What is the link between population and resources?

## Why has there been an increase in demand for resources?

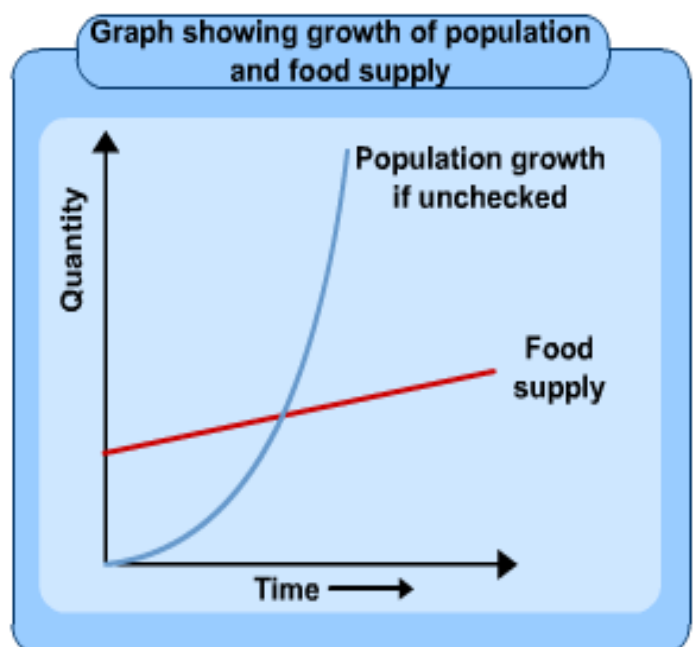
1. Population growth – As cities grow larger to accommodate more people, trees are cut down to make more room for houses and roads. 50% of the world's population now lives in cities. There has also been a change in diets, with increased demand for meat from places like China.
2. Increase in wealth - As a country becomes more wealthy, there will be an increase in its demand for water e.g. for spas, golf courses, baths and showers.
3. Urbanisation - Fuel switching occurs as like traditional wood burning is switched for centralised energy sources. Also increase in motorised traffic and increases the demand for energy.
4. Industrialisation - will be more demand on water. For example in India Coca-Cola uses over a million litres of water a day to produce drink

There are two possible outcomes:

1. A future where there are not enough resources for the global population. This will lead to mass starvation, and ultimately a fall in population
2. A future in which people successfully use technology in order to provide resources for the growing population

## Malthus

- ❑ Believed that population grew exponentially (doubling at each stage: 1:2:4:8:16) and that food production grew arithmetically (adding one unit at each stage 1:2:3:4:5)
- ❑ Once population outstrips food supply, population will decrease through starvation (a natural check), other natural checks included war, disease and morality



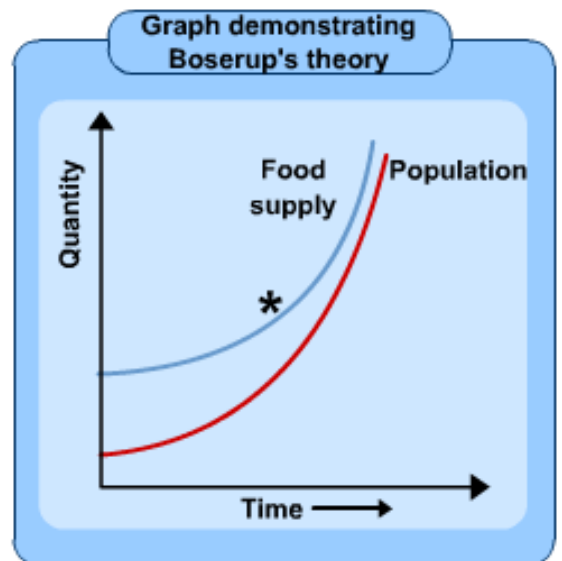
# BQ6: What is the link between population and resources?

## What is the evidence for Malthus' views?

- Famines are frequently happening in less developed world countries.
- Global warming, oil spillage, ozone depletion, desertification could result in less food being grown.
- Malthusian supporters argue that everything at the moment may appear ok but this doesn't mean we won't face future disasters.
- A lot of people believe that future conflicts could be fought over water supplies.

## Esther Boserup (1910-1999)

- A Danish economist who worked for the UN
- Opposed the ideas of Malthus and did not like the idea of 'natural checks'
- Argued that food production does not limit or control population growth, and that instead population growth controls farming methods.
- She believed that people would invent solutions to the problem through agricultural intensification and using better farming techniques and chemical fertilisers



## What is the evidence for Boserup's views?

- There is enough food to feed the world – trouble is, it's not always where it is needed.
- Famine is more likely to be the result of a natural disaster or war.
- New farming machinery means farmers can grow more, higher yields.
- The green revolution produced seeds that could grow quicker and bigger

# Homework 1

Try to answer all of these key knowledge questions. Then check your answers using the answer page. These are some of the questions that will be in the knowledge quizzes and the mid and end of unit tests.

Key knowledge question	Your answer
Glacial periods were 5-6°C colder than today. Explain how a change in Earth's orbit can lead to a glacial period (2)	
What is a sunspot? (1)	
Explain how an increase in sunspots affects climate (2)	
What impact does a volcanic eruption have on climate?(1)	
5. How and why did the 1991 eruption of Mt Pinatubo in the Philippines affect climate (2)	
Explain how asteroid impact affects global climate (2)	



# Homework 3

You should complete revision in preparation of your end of topic test. This includes producing revision cards on the key areas outlined below:

Key content	Revision notes completed	Revised?
1. What are the characteristics of global biomes and where are they found?		
2. What global factors impact the distribution of biomes?		
3. How do local factors alter biome distribution?		
4. What resources does the biosphere provide?		
5. How does the biosphere regulate?		
6. What is the link between population and resources?		

Video resources:

1. [Edexcel GCSE Geography - Global Biomes and Ecosystems – YouTube](#)
2. [The Earth's Biosphere](#)
3. [Human Population and Resource Consumption](#)

# Key knowledge questions

Key knowledge question	Your answer
Glacial periods were 5-6°C colder than today. Explain how a change in Earth's orbit can lead to a glacial period (2)	If Earth's orbit become elliptical rather than round (1) earth spends more time further from the sun, meaning it receives less sunlight so is cooler (1)
What is a sunspot? (1)	An explosion on the sun
Explain how an increase in sunspots affects climate (2)	An increased amount of sunspots adds more energy to Earth (1) so increasing temperature (1)
What impact does a volcanic eruption have on climate?(1)	Eruptions lead to cooling
5. How and why did the 1991 eruption of Mt Pinatubo in the Philippines affect climate (2)	It released 17 million tonnes of sulphur dioxide; enough to reduce global sunlight by 10%, cooling the planet by 0.5 °C for about a year.
Explain how asteroid impact affects global climate (2)	The collision can force into the air dirt, particles and any other matter that in turn can block out the sunlight and lower the overall temperature.



## Question 1:

Always read the question carefully before you start writing your answer. Make sure you are clear about what the topic of the question is.

**In this question, up to four additional marks will be awarded for your spelling, punctuation, grammar and use of specialist terminology.**

**Assess** the view that human activities causing climate change have become more important than the natural causes of climate change.  
**(8 marks)**

### Structuring your answer

1

**Point** - identify your first impact

- This needs to be one sentence that is clear and concise
- **Connectives:** Firstly/Secondly/Finally or On one hand/On the other hand/Overall or To begin with

2

**Explain** your first impact. Use the so what effect.

- Always go into detail, aim for 2-3 sentences
- **Connectives:** This means that, Therefore, This links to, This causes, Consequently

3

**Evidence**

- Give an example or some evidence – the more specific you are, the better you will perform overall.
- **Connectives:** For example/For instance, Such as, This links to, As seen by/in

4

**Counter argument (be critical)**

- You should be critical i.e. consider counter arguments to your initial point
- **Connectives:** However, On the other hand, Although, Alternatively

5

**Evaluation** (link to the question)

- This is where you link your paragraph back to the question by stating what you think overall and how your response answers the question
- **Connectives:** Overall, To summarise, In conclusion, I believe that, Ultimately

Level 1	1-3	<ul style="list-style-type: none"> <li>• Demonstrates isolated elements of understanding of concepts and the interrelationship of places, environments and processes. (AO2)</li> <li>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)</li> </ul>
Level 2	4-6	<ul style="list-style-type: none"> <li>• Demonstrates elements of understanding of concepts and the interrelationship of places, environments and processes. (AO2)</li> <li>• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)</li> </ul>
Level 3	7-8	<ul style="list-style-type: none"> <li>• Demonstrates accurate understanding of concepts and the interrelationship of places, environments and processes. (AO2)</li> <li>• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3)</li> </ul>

**Assess** the view that human activities causing climate change have become more important than the natural causes of climate change. (8 marks)

*Human activities like increased use of fossil fuels from vehicles has had an immense impact on climate change, as it has polluted air and seas, which kills some animals/fish populations. It also heats up the Earth causing ice caps to melt, and sea levels to rise, which increases chances of coastal flooding, potentially affecting crops and animal habitats.*

*Natural causes of climate change, like volcanoes, release a layer of ash in the air, which blocks the sun's rays from heating the Earth, and increases pollution into the air which kills animals and destroys their habitats. Some also have a long pyroclastic flow which destroys vegetation, killing sources of food and income.*

*I think that human activities on climate change have had an increasing detrimental affect on animal habitats, and loss of vegetation etc. Natural causes of climate change have always affected the world, and they're unpreventable, whereas we can stop human activities which affect climate change.*

**Results Plus: Examiner Comments**

This is a typical lower level 2 response. The candidate identifies some human causes of climate change without establishing a link to the mechanics of the greenhouse effect. There is also some brief coverage of some of the natural causes of climate change with some limited assessment towards the end of the response. Level 2 - 4 marks.

**Results Plus: Examiner Tip**

In 'assess the view' questions try and produce an argument in support of the view and also mention why some people may have an alternative viewpoint.