



Question(s)

What is meant by an ecosystem?

Answer(s)



An ecosystem is a natural system of interdependent and interrelated living and non-living components.

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Question(s)

Define the terms:  
 (i) Producers  
 (ii) Decomposers  
 (iii) Food Chain

Answer(s)



- (i) **PRODUCERS** – these convert sunlight into sugars (glucose) through the process of photosynthesis
- (ii) **DECOMPOSERS** – these break down plant and animal matter releasing nutrients back into the soil
- (iii) **FOOD CHAIN** – these show the direct links between producers and consumers

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Question(s)

Define the terms:  
 (i) Consumer  
 (ii) Food Web  
 (iii) Nutrient Cycle

Answer(s)



- (i) **Consumer** – these get their energy from the food generated by the producer
- (ii) **Food web** – these show all the complex connections between producers and consumers in an ecosystem
- (iii) **Nutrient Cycle** – this is the way that nutrients are recycled in an ecosystem

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Question(s)

Describe two examples of inter-relationships in ecosystems

Answer(s)



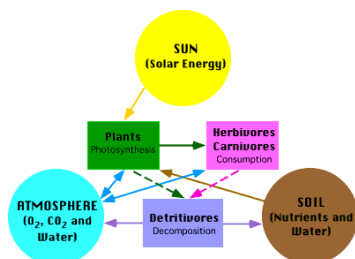
- Soil provides nutrients and water for plants. In turn when these die and decompose they release nutrients back into the soil
- Fungi and bacteria help to break down dead organic matter which returns nutrients back to the cycle
- Sunshine and rain is important enabling plants to undertake the process of photosynthesis. Through this they then produce glucose / energy which animals then consume. In turn animals / insects often help with the germination / carrying of seeds to enable plants to reproduce. **Any other relevant inter-relationship accepted**

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Question(s)

Describe any two links shown in the diagram



Answer(s)



Any two for example:

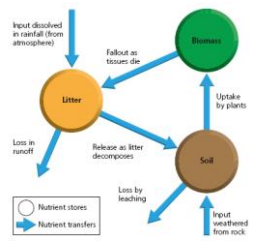
1. Plants take in CO<sub>2</sub> from the atmosphere via the process of photosynthesis. However, they also release O<sub>2</sub> to the atmosphere.
2. Detritivores will decompose organic matter from dead plants and animals – these return nutrients to the soil. In turn these are then taken up by plants to grow.

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**Question(s)**

Describe how nutrients are recycled in an ecosystem. (you can use the diagram to help).



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**Answer(s)**



Soil gets some nutrients from the weathering of rock. Plants take up nutrients from the soil which are then stored in the biomass (living matter). As plants and animals die they become organic matter (litter – dead leaves etc.) as these decompose they release nutrients into the soil which are then taken up by plants and so on.

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**Question(s)**

Give examples of producers and consumers found in Epping Forest (your example of a small-scale UK ecosystem)

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**Answer(s)**



**Producers:** Large number of native trees (e.g. oak, birch and hornbeam). Shrubs include hazel. There are also grasses, wildflowers and moss/lichen.  
**Consumers:** Large number of native trees (e.g. oak, birch and hornbeam). Shrubs include hazel. There are also grasses, wildflowers and moss/lichen.

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Name locate a small-scale ecosystem you have studied in the UK

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**Epping Forest** – 2,400 acres of ancient deciduous woodland on the border of Greater London and Essex.

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Give examples of changes to the balance in the Epping Forest Ecosystem.

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1. Deer are enclosed in the forests (avoid collisions on roads around forest) but eat a lot of ground level plants / damage trees.
2. Pressures from human activities due to surrounding urban areas (e.g. horse riding, walking)
3. Pollarding stopped in 1978 – now dense canopy grown letting little light through
4. Balance in the forest ecosystem is affected by extremes such as drought (1976-77) and storms (e.g. 1987 Great Storm) causing death of trees.

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**Question(s)**

Describe an example of an interrelationship in a small -scale UK ecosystem you have studied.

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**Answer(s)**



**Epping Forest** – any interrelationship you have studied. For example –

Pollarded trees get new growth of denser branches many of which fall in storms creating dead wood – provides homes for decomposers. These in turn help break leaves down and return nutrients to the soils. In turn these nutrients are taken up in spring / summer – provide fruits, berries and leaves which supports birdlife!

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Question(s)

How might the loss of a species affect an ecosystem? – describe using an example of an outbreak of disease on bark beetles in an oak woodland.

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Answer(s)



- Disease will reduce beetle population
- More oak trees (because fewer beetles feeding on them)
- Woodpecker numbers will decrease (less beetles to eat)
- Woodpeckers may eat more caterpillars which are a major food source for blue tits – blue tits will decrease in number
- With less woodpeckers owl and hawks which feed on them will decrease in number.

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Question(s)

Give 4 examples of factors affecting the location of the world’s major biomes.

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Answer(s)



1. Altitude
2. Ocean Currents
3. Latitudes
4. Relief
5. Distance from the Sea

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Question(s)

Which biome best fits this description?

*Contain trees that lose their leaves and are found across Europe and the USA. The weather is mild and wet. The climate is known as temperate maritime.*

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Answer(s)



Temperate Deciduous Woodland

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Question(s)

Which biome best fits this description?

*Surrounds the north and south poles where the sun’s rays have little strength. They have an extremely cold climate with limited numbers of plants and animals. Temperatures are below freezing for most of the year.*

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Answer(s)



Tundra

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Question(s)

Which biome best fits this description?

*Here the sun’s rays are highly concentrated and there is a high-pressure system due to descending air. The Dry sinking air stops clouds forming. Plant and animal life is highly adapted to heat and lack of moisture.*

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Answer(s)



Deserts

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Question(s)

Describe the location of Rainforests

Answer(s)



Close to the equator, between the tropics of cancer and Capricorn in parts of Central and South America, Western Africa and large parts of Indonesia.

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Question(s)

Describe the location of deserts

Answer(s)



Found between 20° and 30° north and south of the equator (mostly in dry continental interiors)

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Question(s)

Describe the typical climate of Tropical Rainforests

Answer(s)



These have high rainfall (often over 2500mm a year) and high temperatures (average – 27°C) all year round with a small temperature range. They lack seasons (also known as an equatorial climate).

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Question(s)

Account for the high temperatures and rainfall totals found in Tropical Rainforests.

Answer(s)



**High temperatures** – due to the sun being overhead most of the time (location close to the equator – where sun is most concentrated)

**High Rainfall** – at this point there is an area of low pressure with air rising in the Hadley cell. Rising air results in condensation and cloud formation and triggers high levels of rainfall.

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Question(s)

Describe the main layers of rainforest vegetation

Answer(s)



1. **Emergents** (tallest trees) (may be 35-50m tall) – get the most light
2. **Canopy** – ‘engine of the rainforest’ most photosynthesis occurs here
3. **Under Canopy** – sunlight is more limited – saplings / seedlings wait for larger trees to die / leave gaps
4. **Forest Floor / Shrub Layer** – dark / gloomy with little vegetation – lots of plant litter on the floor.

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Question(s)

Describe the location and main characteristics of the Amazon Rainforest.

Answer(s)

**Location** – covers most of the Amazon basin of South America, found in 9 countries including Peru and Columbia – 2/3 of the Amazon is in Brazil.

**Characteristics** 6.9 million km<sup>2</sup> – the world’s largest  
At least 40,000 plant species, 1,300 bird species and more than 400 mammal species.

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Question(s)

Give 4 causes of deforestation in the rainforest

Answer(s)

1. **Logging** – e.g. for paper and furniture (e.g. Mahogany)
2. **Mining** – precious minerals – e.g. bauxite gold and iron-ore (e.g. Carajas – world’s largest iron-ore mine)
3. **Energy** – HEP key – rainforest removed, flooded and dams created (e.g. Belo Monte HEP dam)
4. **Road Building** – e.g. Trans-Amazonian Highway
5. **Commercial Farming** – 70% of deforestation in Amazon due to farming of livestock and crops (e.g. palm oil, soy etc.)
6. **Population Resettlement** – e.g. reduce population problems in cities such as Sao Paulo.

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Question(s)

Give 4 examples of the consequences of deforestation (make sure you use your notes and learn examples where possible).

Answer(s)

1. Global Warming
2. Impacts on local climate change
3. Loss of biodiversity
4. Soil erosion and fertility
5. River pollution
6. Conflict with indigenous tribes

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Question(s)

Why are rainforests potentially important for medicines?

Answer(s)

- Indigenous people have long used plant extracts for treating and curing diseases
- Less than 1% of rainforest trees and plants have been tested and many more cures could be found
- Examples include Quinine – used in Malaria and Rosy Periwinkle used in the treatment of childhood Leukaemia

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Question(s)

What benefits do rainforest provide to people and the environment?

Answer(s)

1. Benefits to the environment – water and nutrient cycling and protection from soil erosion
2. Benefits to people – tourists benefit from the forests biodiversity; medicines; resources (e.g. wood, fruits, rubber etc.)
3. Benefits to people AND the environment – air purification (production of O<sub>2</sub>) and acts as a carbon sink – therefore helps with climate regulation and tackling the problem of global warming.

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Question(s)

What does sustainable management of the rainforest mean?

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Answer(s)



Using goods and services from the rainforest in such a way that they are still available to benefit people in the future.

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Question(s)

Give two examples of how rainforests can be managed at the **international level**.

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Answer(s)



1. **International Agreements** – e.g. International Tropical Timber Agreement – restricting hardwoods taken from the tropical rainforests
2. **Debt Reduction** – e.g. ‘debt for nature swaps’ – 2010 – USA agreed to convert a Brazilian debt of £13.5 million into a fund to protect tropical rainforests.
3. **Conservation and Education by NGO’s** – e.g. WWF – promoting conservation message in schools / colleges and training conservation workers.

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Question(s)

Why can it sometimes be difficult to get support from national governments to tackle deforestation problems?

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Answer(s)



1. Governments not willing to do things that will slow economic development
2. A lot of corruption in the way (e.g. illegal loggers / developers paying bribes!)

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Question(s)

Give examples of management of rainforests at the **local level**.

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Answer(s)



1. **Selective logging** (only cutting trees when fully grown – and replacing trees)
2. **Stopping illegal logging**
3. **Agroforestry** – combining crops and trees
4. **Replanting** – collecting seeds from remaining primary forests which are cultivated in nurseries and planted in deforested areas
5. **Conservation and Education** – nature reserves and biosphere reserves
6. **Ecotourism** – locals benefit from guiding / employment (and educates visitors about need to protect rainforest)

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Question(s)

Describe the hot desert climate

c

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Answer(s)



Extreme high temperatures (particularly in summer) with temperature on average 30-34°C.  
Low annual rainfall – usually between 100-200mm per year and unreliable.

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Question(s)

Give 3 named examples of Hot Deserts (and their locations)

Answer(s)

1. Sahara Desert – Africa
2. Atacama Desert – South America
3. Namib - Africa



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Question(s)

Explain the reasons for the hot desert climate

Answer(s)

Most deserts are at 30° North or South of the equator – air is sinking (high pressure) – as it isn't rising – few clouds forming and little rain. Lack of cloud means hot during the day and very cold at night.



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Question(s)

What is the diurnal temperature range like in hot deserts and why?

Answer(s)

There is high diurnal temperature range because lack of cloud means that temperatures during the day are very hot. At night temperature fall to very cold as there is nothing to keep the heat in (lack of clouds)



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Question(s)

What is the definition of a desert?

Answer(s)

An area receiving less than 250mm of rainfall resulting in extreme aridity.



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Question(s)

Describe the key characteristics of soils in hot deserts

c

Answer(s)

Sandy, rocky soils, typically about 1m deep. Lack organic material and may have white powder on the surface where salts are drawn to the surface by evaporation.

(if irrigate some desert land can be productive)



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Question(s)

1. Describe the location of the Thar Desert
2. How much area does it cover?
3. What is its population density?

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Answer(s)



1. The Thar desert is located partly in NW India and partly E Pakistan
2. Covers 200,000 km<sup>2</sup>
3. Population of 30 million and density of 83/km<sup>2</sup> (most populated in the world)

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Question(s)

Describe 2 examples of opportunities for development in the Thar Desert.

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Answer(s)



1. **Mineral Extraction** – Kaolin (China Clay) can be used in manufacturing of paper. Other valuable minerals – e.g. limestone, white marble
2. **Tourism** – desert is popular with tourists – exotic location and culture – provides source of income (can sell souvenirs, act as tour guides etc.)
3. **Farming** - commercial crops e.g. cotton can be grown when supported by irrigation using water from the Indira Gandhi Canal
4. **Energy production** – solar and wind energy opportunities (e.g. at Bhaleri) and coal and oil extraction in the Barmer district provides income and power electricity parts in Pakistan and India.

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Question(s)

What are the challenges with regards to accessibility in the Thar Desert?

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Answer(s)



Limited road access across the desert. High temps – cause tarmac to melt.

Cars often overheat, and breakdowns are common

Poor public transport – overladen buses.

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Question(s)

What are the challenges of the Thar desert's extreme climate?

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Answer(s)



- Average temps may exceed 50°C in summer
- Heat challenge for farmers working outside
  - Heat leads to high evaporation and salinisation of soils
  - Livestock need shade from intense sun
  - Challenge of water shortage (low annual rainfall)
  - Groundwater main source – but often saline
  - Drought led to many young leaving area
  - Some tributaries of the River Luni are only intermittent (only flow during certain seasons).

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Question(s)

Define the term desertification

c

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Answer(s)



This is the process whereby land which once was fertile is gradually turned into a desert.

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Answer(s)



Question(s)

How can climate change cause desertification?

Reduced rainfall in places like the Sahel means drier climate and increase in desertification (less vegetation can grow, ground dries out – with less ground cover soil is eroded and baked hard).

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Answer(s)



Question(s)

Give 2 examples of human causes of desertification.

- 1. **Over-cultivation** – due to demands for more food – leads to soil exhaustion (becomes infertile and turns to dust)
- 2. **Overgrazing** – can lead to vegetation being stripped and trampling causes an increase in runoff
- 3. **Demand for Fuelwood** – trees are stripped of branches – eventually die.

All the above result in soil erosion – vegetation cover is removed, and loose soil is blown away and exposed top soils is baked hard. Rain washes any top soil away.

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Answer(s)



Question(s)

Describe and explain two examples for managing desertification.

- Land Management** – e.g. Atriplex shrubs in Jordan to trap water, bind soil and provide grazing; ponding banks in Australia to store water; stone lines in Burkina Faso to reduce soil erosion.
- Tree Planting** – e.g. in Thar Desert – Prosopis Cineraria tree – reduces soil erosion – roots bind soil and stabilise it and provides shade for other plants.
- Use of appropriate technology** – fuel efficient stoves and solar cookers – to reduce need for fuelwood – reducing deforestation which can lead to soil erosion.

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What is meant by the term appropriate technology

Small scale, sustainable improvements / solutions to problems which use simple technologies most suitable for people on a local scale – low cost and sustainable.

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Question(s)

Describe the characteristics of Tropical Rainforest Soils

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Answer(s)



Quite infertile, heavily leached as rain washes nutrients out leaving iron-rich latosols.

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Question(s)

How can there be so much vegetation in the rainforest despite relatively infertile soil?

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Answer(s)



- Many nutrients in litter layer
- Dead leaves decompose rapidly (heat and moisture)
- Trees / plants have shallow roots quickly collecting nutrients from the litter layer / upper soil
- Fungi helps to break down and release nutrients to the roots

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Question(s)

Give 3 reasons for the high biodiversity (number of species) living in Tropical Rainforests.

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Answer(s)



1. Long evolution (oldest biome on earth)
2. High levels of solar energy and rainfall (ideal growing conditions)
3. Range of local habitats providing homes for many species
4. Species are highly adapted to compete with others
5. Been relatively isolated up until 20<sup>th</sup> century – with little physical / human disturbance.

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Question(s)

Give 3 ways in which plants have adapted in Tropical Rainforests.

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Answer(s)



1. **Drip Tips** – allow heavy rain to drip off leaves to cope with heavy rainfall
2. **Epiphytes** – live on branches high up in canopy to get sunlight and nutrients.
3. **Lianas** – rooted to the ground but use trees to grow up to canopy to get sunlight
4. **Buttress Roots** – help support the base of tall trees enabling them to grow up tall to reach sunlight

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Question(s)

Give two examples of how animals have adapted to life in Tropical Rainforest.

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Answer(s)



1. **Toucan's** – strong beaks to crack open hard nuts
2. **Sloths** – have fur covered in green algae – camouflage to help escape prey
3. **Squirrel Monkeys** – prehensile tails to move quickly from branch to branch in the canopy where most of the food is in the form of fruits and berries.

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