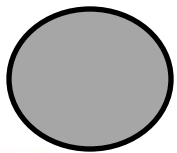


Ecology 2

Revision Session



Content you will **NOT** be assessed on



7.3.1 Biodiversity

Think

Pair

Share

What is biodiversity?

Biodiversity is the variety of all the different species of organisms on earth, or within an ecosystem.

An **ecosystem** is the interaction of a community of living organisms with the non-living parts of their environment.

An **organism** is a living thing that has an organised structure.



CS/F

CS/H

SS/F

SS/H



7.3.1 Biodiversity

Think

Pair

Share

Why is biodiversity important?

A great biodiversity ensures the stability of ecosystems.

It does this by reducing the dependence of one species on another for food, shelter and the maintenance of the physical environment.

If biodiversity it reduced this could put plants and animals at risk of **extinction**.

Extinction is when there is non of the species left

7.3.1 Biodiversity

Think

Pair

Share

Why is biodiversity important?

The future for humans relies on us maintaining a good level of biodiversity.

Plants and animals may provide us useful substances.

It is also a duty to preserve species for future generations.



BUT many human activities are reducing biodiversity and only recently have measures been taken to try to stop this reduction.

CS/F

CS/H

SS/F

SS/H



7.3.2 Waste Management


Think

Pair

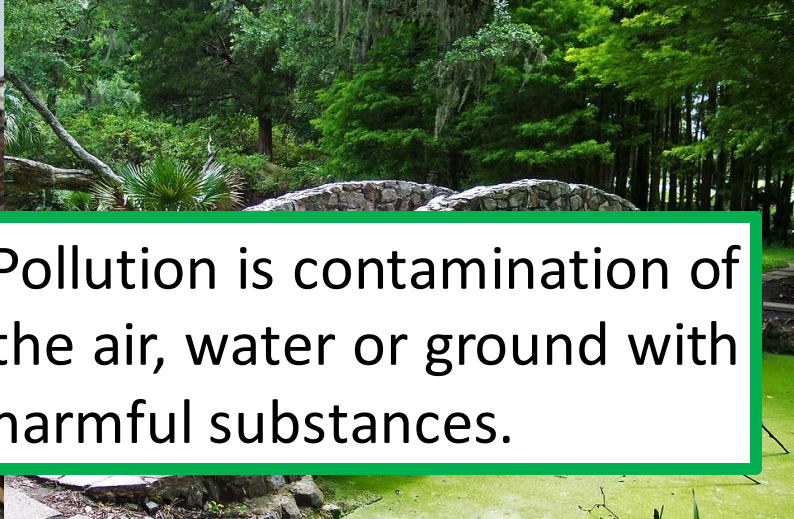
Share

Why is more waste being produced?

Rapid growth in the human population and an increase in the standard of living mean that increasingly more resources are used and more waste is produced.



Waste is unwanted or unusable materials. It can lead to pollution.



Pollution is contamination of the air, water or ground with harmful substances.

7.3.2 Waste Management

Think

Pair

Share

Why is more waste being produced?

Pollution can occur:

On land, from landfill and
from toxic chemicals.

Landfill is a place where
refuse is buried
underground.



CS/F

CS/H

SS/F

SS/H



7.3.2 Waste Management

Think

Pair

Share

Why is more waste being produced?

Pollution can occur:

In water, from sewage, fertiliser or toxic chemicals.



CS/F

CS/H

SS/F

SS/H



7.3.2 Waste Management

Think

Pair

Share

Why is more waste being produced?

Pollution can occur:

In air, from smoke
and acidic gases.



7.3.2 Waste Management

Think

Pair

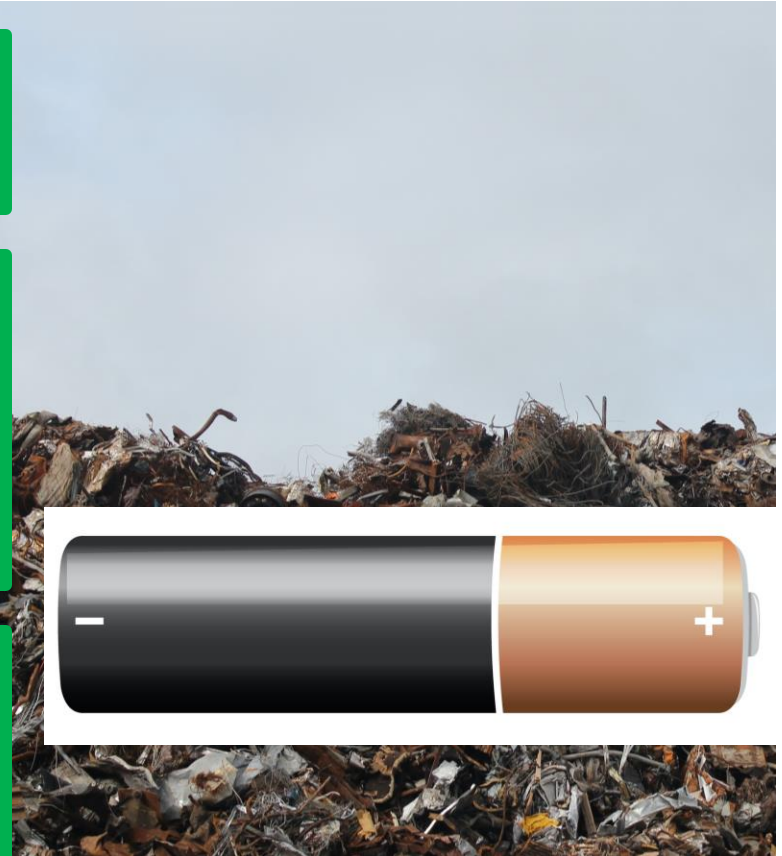
Share

How does pollution on land occur?

Any rubbish that is thrown out and not recycled goes to landfill.

Sometimes people dump rubbish in public places to avoid paying for it to be disposed of. This is known as fly tipping.

Toxic chemicals can also get put in landfill. Batteries for example can cause this.



CS/F

CS/H

SS/F

SS/H



7.3.2 Waste Management

Pollutant	How the Pollutant is Produced	Problem the Pollutant Causes

7.3.2 Waste Management

Pollutant	How the Pollutant is Produced	Problem the Pollutant Causes



7.3.2 Waste Management

Pollutant	How the Pollutant is Produced	Problem the Pollutant Causes



7.3.2 Waste Management

Think

Pair

Share

How does pollution in water occur?

Water can become polluted by different sources including residential areas, industry and agriculture.

Sewage from residential areas can contaminate water and chemicals that farmers add to their fields can wash into nearby water also.

Sometimes in industrial areas toxic chemicals can be released illegally.

'Hyper-nutrition' resulting from fertiliser pollution of aquatic ecosystems.

Eutrophication



CS/F

CS/H

SS/F

SS/H



7.3.2 Waste Management

Think
Pair
Share

How does pollution in water occur?

Fertilisers and sewage enter a water source.

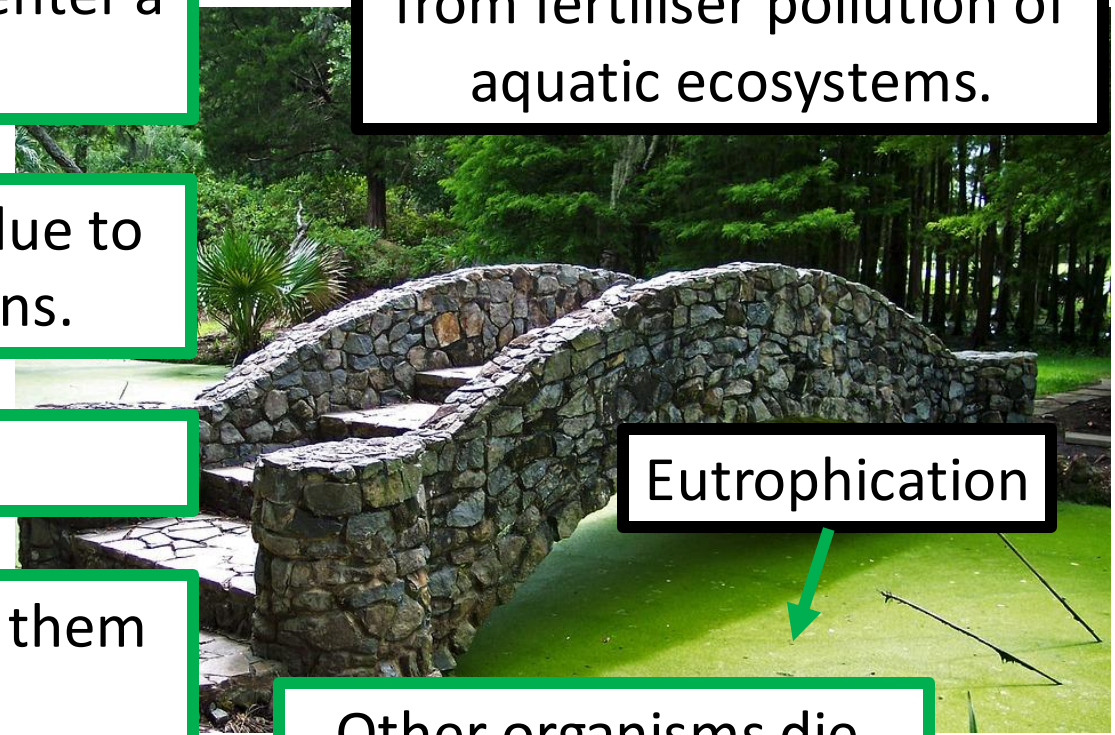
Mass growth of algae due to increased mineral ions.

Algae die.

Decomposers feed on them and respire.

Oxygen decreases.

'Hyper-nutrition' resulting from fertiliser pollution of aquatic ecosystems.



Eutrophication

Other organisms die.

- CS/F
- CS/H
- SS/F
- SS/H


7.3.2 Waste Management

Think

Pair

Share

How does pollution reduce biodiversity?



All of these forms of pollution destroy habitats.

This means that they all reduce biodiversity.



CS/F

CS/H

SS/F

SS/H



7.3.3 Land Use



Farming



Building



Quarrying



Dumping Waste

CS/F

CS/H

SS/F

SS/H

7.3.3 Land Use



By using this land, we remove habitats for the plants and animals and reduce biodiversity.

More land is being lost as the human population is increasing and there is an increased standard of living.

7.3.3 Land Use

Think

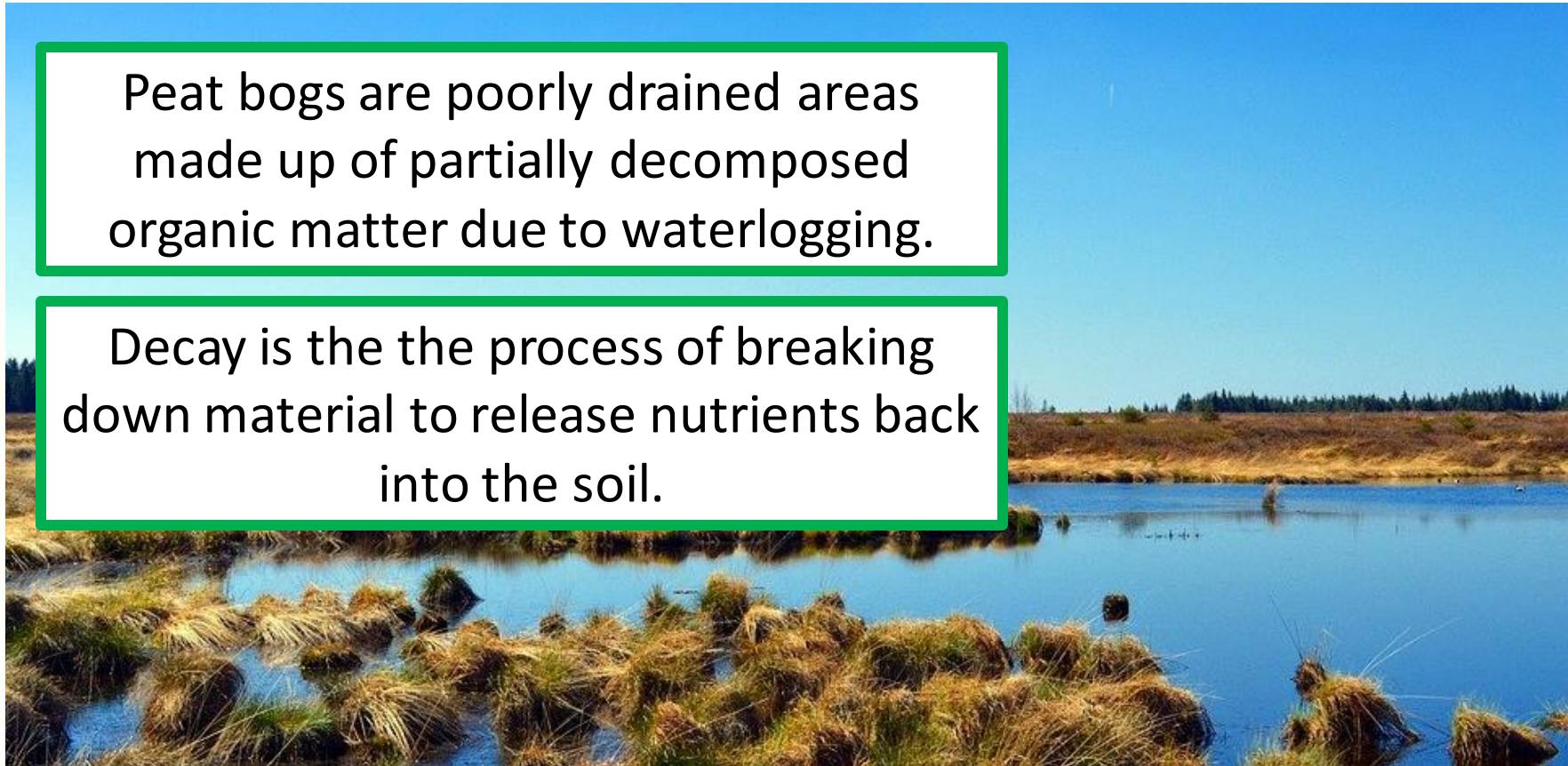
Pair

Share

What are peat bogs?

Peat bogs are poorly drained areas made up of partially decomposed organic matter due to waterlogging.

Decay is the the process of breaking down material to release nutrients back into the soil.



7.3.3 Land Use

Think

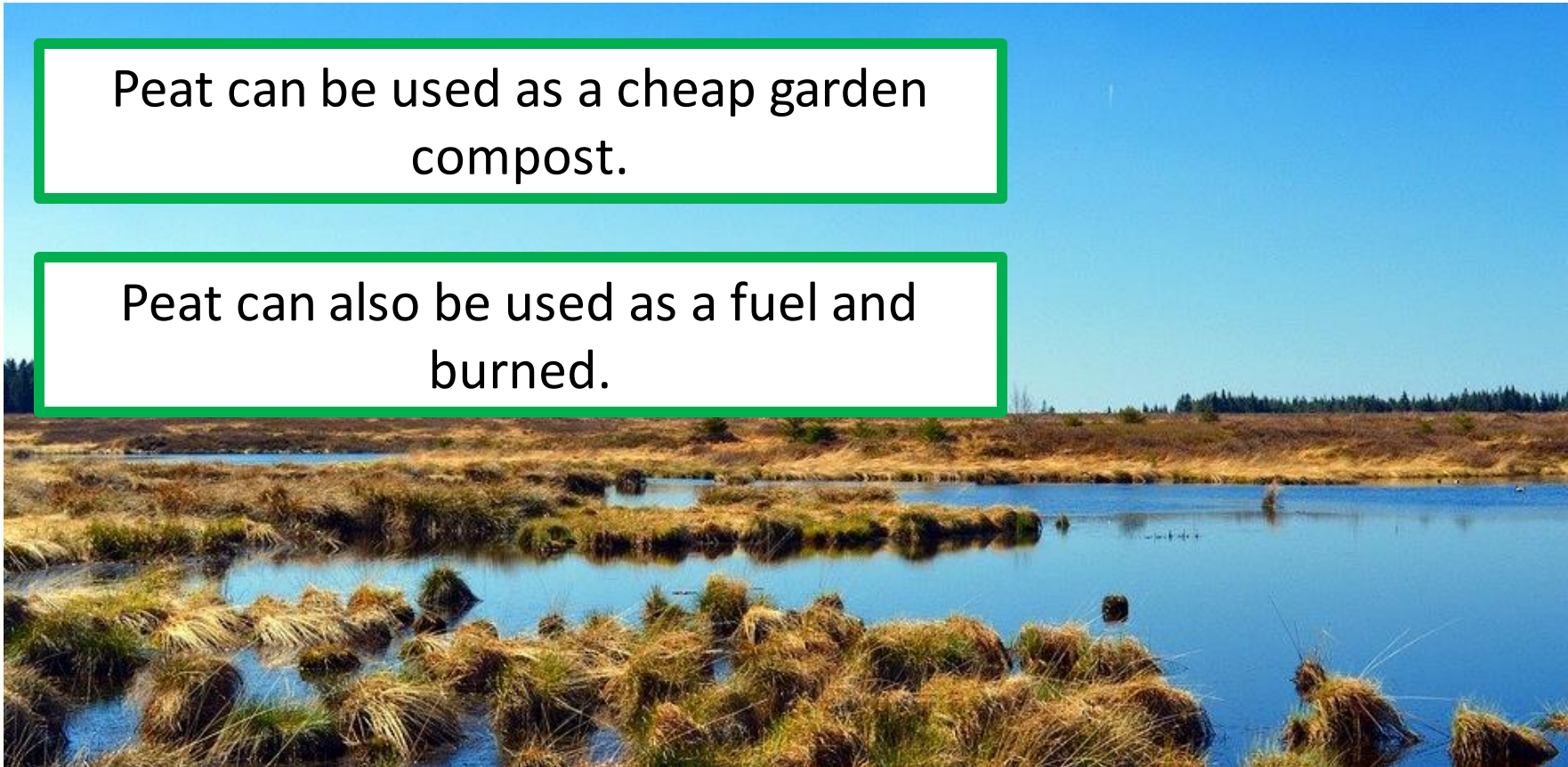
Pair

Share

What uses do humans have for peat?

Peat can be used as a cheap garden compost.

Peat can also be used as a fuel and burned.



7.3.3 Land Use

Think
Pair
Share

What are the problems of using peat in this way?

Peat takes a long time to form and so is a non renewable fuel.

A non renewable fuel is a resource that cannot be replaced when used up. Coal and oil are other examples.

Burning peat releases carbon dioxide.

This can cause global warming.

Using peat destroys habitats.

This reduces biodiversity.

CS/F

CS/H

SS/F

SS/H

7.3.3 Land Use

Think
Pair
Share

Why do we use peat as compost if we should conserve peat bogs?

Advantages	Disadvantages

7.3.4 Deforestation

Think
Pair
Share

What is deforestation and why does it occur?



Deforestation is when trees are cleared over a wide area.

We do this to provide land for cattle and rice fields.

It also occurs to provide space to grow crops for biofuels.

7.3.4 Deforestation

Think
Pair
Share

What are the advantages and disadvantages of deforestation?

Advantages of Deforestation	Disadvantages of Deforestation

7.3.5 Global Warming

Think

Pair

Share

What are greenhouse gases?

Can you give any examples?

7.3.5 Global Warming

Think
Pair
Share

Greenhouse gases are gases that contribute towards climate change.

Examples include:

- Carbon Dioxide
- Methane
- Water Vapour

These molecules are a concern as they can stay in the air for years or even centuries.



Not a huge concern as molecules only stay in the air a few days.

CS/F

CS/H

SS/F

SS/H



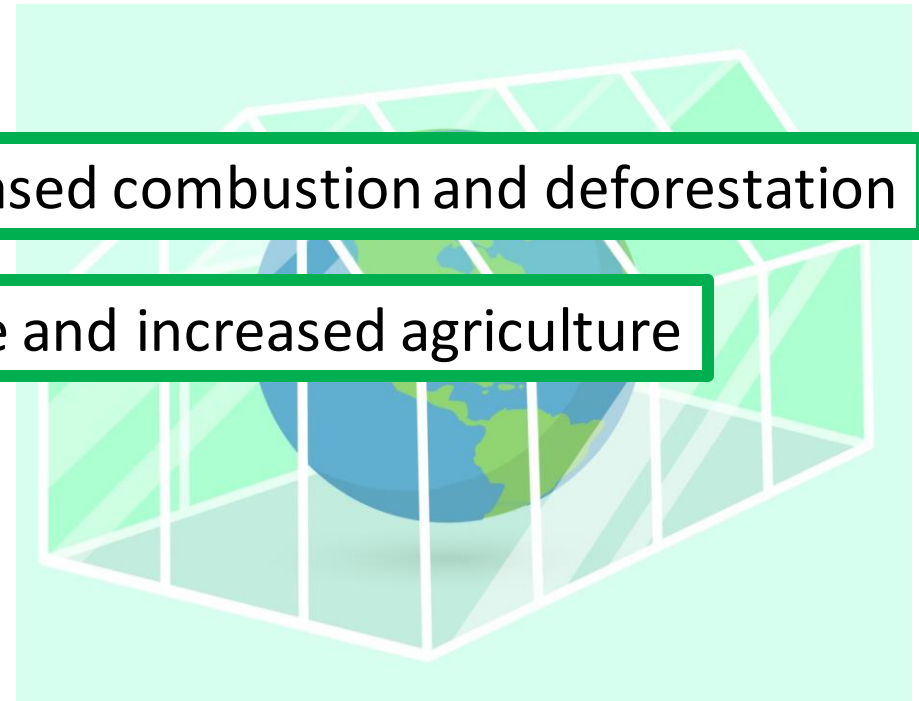
7.3.5 Global Warming

Think
Pair
Share

How are methane and carbon dioxide produced by human activities?

Examples include:

- Carbon Dioxide — Increased combustion and deforestation
- Methane — Waste and increased agriculture
- Water Vapour



7.3.5 Global Warming

Think

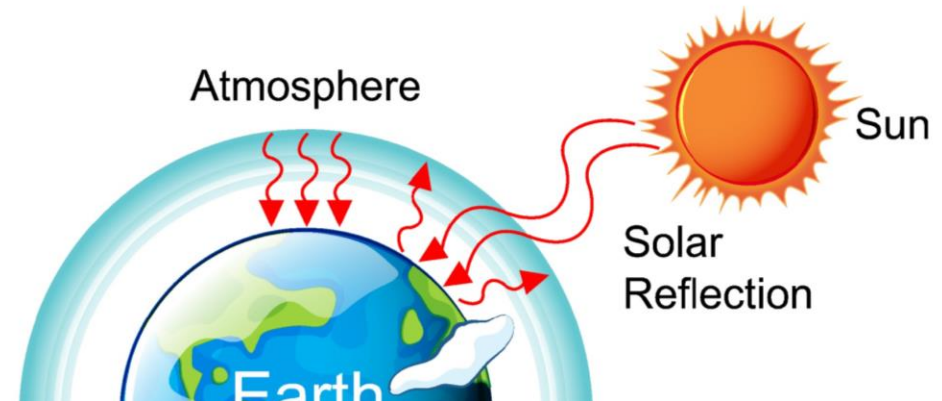
Pair

Share

What is the greenhouse effect?

The greenhouse effect traps some of the energy from the sun and keeps our planet at a suitable temperature for life.

The greenhouse gases in the atmosphere absorb some of the energy radiated by Earth and this is reradiated back to Earth.



Over the years there has been an increased release of these greenhouse gases which has led to global warming.

CS/F

CS/H

SS/F

SS/H



7.3.5 Global Warming

Think
Pair
Share

What is global warming?



Global warming is the rise in the average temperature of the Earth's surface.

CS/F

CS/H

SS/F

SS/H

7.3.5 Global Warming

Think
Pair
Share

What are the consequences of global warming?

Polar Ice Caps Melting

Organisms that live on the ice are losing their habitat.



Sea levels rise.



This causes flooding elsewhere.



Areas that were flooded with sea water will have saltier soil.



This can also destroy habitats.



CS/F

CS/H

SS/F

SS/H

7.3.5 Global Warming

Think
Pair
Share

What are the consequences of global warming?

Extreme Weather

Extreme weather becomes more frequent.

This can include more storms.

This can cause flooding.

It can also destroy habitats.



CS/F

CS/H

SS/F

SS/H

7.3.5 Global Warming

Think
Pair
Share

What are the consequences of global warming?

Changes to Migration

Organisms such as birds or insects may change migration patterns.

They may migrate later, earlier or migrate elsewhere.

This can disrupt food chains.



CS/F

CS/H

SS/F

SS/H

7.3.5 Global Warming

Think
Pair
Share

What are the consequences of global warming?

Extinction

Different plants and animals will be at risk of extinction.

Some scientists predict that by 2050 30% of plants and animals could be at risk.

Losing nesting sites because of rising sea levels.



Warmer sand is causing more turtles born to be female.

CS/F

CS/H

SS/F

SS/H



7.3.5 Global Warming

Think
Pair
Share

What are the consequences of global warming?

Changes to Rainfall

Some areas will have heavier rainfall and become wetter.

This destroys habitats.

Some areas will have less rainfall and become drier.

This destroys habitats as more land will become desert.



CS/F

CS/H

SS/F

SS/H



7.3.5 Global Warming

Think
Pair
Share

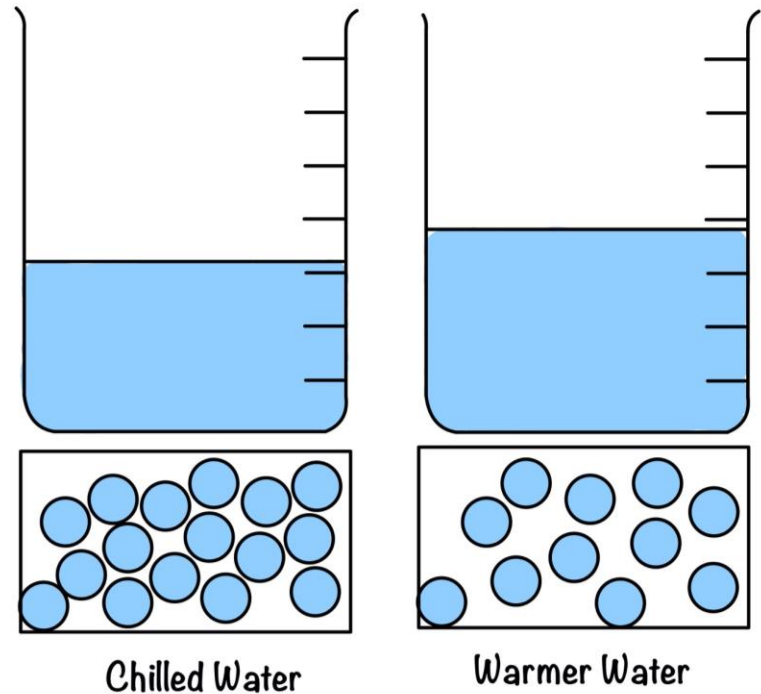
What are the consequences of global warming?

Seawater will Expand

When water is warmed it expands.

Warmer water will mean that the water will have a greater volume.

This can also cause flooding and destroy habitats.



CS/F

CS/H

SS/F

SS/H



Exam Practice

It is suggested that the increased level of carbon dioxide in the air is causing the atmosphere to warm up (the “Greenhouse Effect”).

Describe, as fully as you can, **two** major effects of global warming and how these may affect the human population.

Major Effect	Description	Affect on the Human Population
Climate Change	More extreme weather Changes to Rainfall Warmer/Colder	Affects Food Production Ecosystems destroyed Starvation
Rising Sea Levels	Causing by melting ice caps and expanding sea water	Low land flooded Less food grown Homes/factories flooded

7.3.5 Global Warming

Think
Pair
Share

Why is the theory of global warming widely accepted?

The evidence to support the theory of global warming has been **peer reviewed**.

Peer review is when the science community evaluate the evidence of others.

This prevents false claims.

It also ensures that scientists are confident with the accuracy of the data.



CS/F

CS/H

SS/F

SS/H



7.3.5 Global Warming

Think
Pair
Share

Why is the theory of global warming widely accepted?

Global warming and climate change are complex and difficult to model.

This has caused models to have been simplified.

This has meant some uncertainty and so not all people support the theory.



However

GLOBAL WARMING

CS/F

CS/H

SS/F

SS/H



7.3.6 Maintaining Biodiversity

Think
Pair
Share

What are some of the negative ways humans interact with an ecosystem?



CS/F

CS/H

SS/F

SS/H

7.3.6 Maintaining Biodiversity

Examples of ways that humans have a negative impact include:

Increasing
Waste and
Pollution



CS/F

CS/H

SS/F

SS/H

7.3.6 Maintaining Biodiversity

Examples of ways that humans have a negative impact include:

Increased air pollution which has led to global warming.



CS/F

CS/H

SS/F

SS/H

7.3.6 Maintaining Biodiversity

Examples of ways that humans have a negative impact include:

Deforestation



CS/F

CS/H

SS/F

SS/H

7.3.6 Maintaining Biodiversity

Examples of ways that humans have a negative impact include:

Destruction
of Peat Bogs



7.3.6 Maintaining Biodiversity

Examples of ways that humans have a negative impact include:

Use of land for farming, quarrying and building.



7.3.6 Maintaining Biodiversity

These have all led to a decrease in biodiversity.



Biodiversity is the variety of plant and animal life in the world or in a particular habitat.

CS/F

CS/H

SS/F

SS/H

7.3.6 Maintaining Biodiversity

Think
Pair
Share

What do some humans do to try and reduce the negative effect that we have?



CS/F

CS/H

SS/F

SS/H

7.3.6 Maintaining Biodiversity

Think
Pair
Share

What do some humans do to try and reduce the negative effect that we have?

Reintroduction of field margins and hedgerows in agricultural areas where farmers grow only one type of crop.



CS/F

CS/H

SS/F

SS/H



7.3.6 Maintaining Biodiversity

Think
Pair
Share

What do some humans do to try and reduce the negative effect that we have?

Breeding programs for endangered animals.



CS/F

CS/H

SS/F

SS/H

7.3.6 Maintaining Biodiversity

Think
Pair
Share

What do some humans do to try and reduce the negative effect that we have?

Reduction of deforestation and carbon emissions.



CS/F

CS/H

SS/F

SS/H



7.3.6 Maintaining Biodiversity

Think
Pair
Share

What do some humans do to try and reduce the negative effect that we have?

Protection and regeneration of rare habitats.



CS/F

CS/H

SS/F

SS/H



7.3.6 Maintaining Biodiversity

Think
Pair
Share

What do some humans do to try and reduce the negative effect that we have?

Recycling
resources
rather than
dumping in
landfill.



CS/F

CS/H

SS/F

SS/H



7.4.1 Trophic Levels

Think

Pair

Share

What are the different trophic levels?

Trophic Level	Description
Level 1	
Level 2	
Level 3	
Level 4	

7.4.1 Trophic Levels

Think

Pair

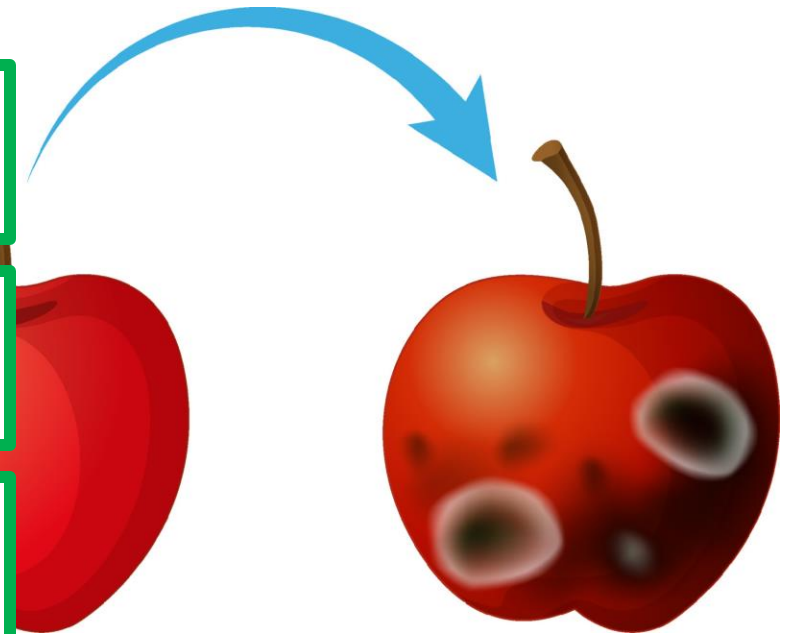
Share

What are decomposers?

Decomposers break down dead plant and animal matter.

They do this by secreting enzymes into the environment.

Small soluble food molecules then diffuse into the microorganism



CS/F

CS/H

SS/F

SS/H

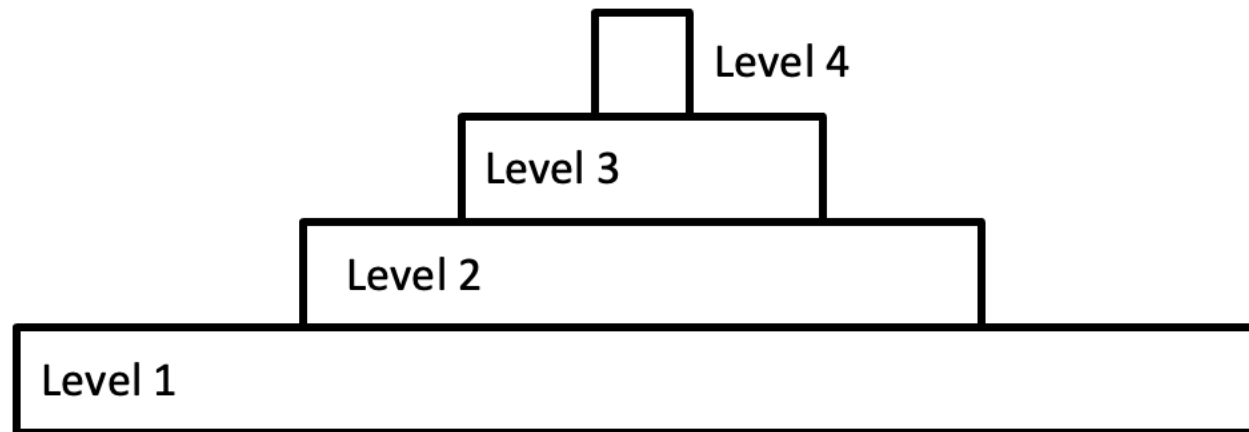


7.4.2 Pyramids of Biomass

Think
Pair
Share

How can we construct a pyramid of biomass?

Pyramids of biomass can be constructed to represent the relative amounts of biomass in each level of a food chain.

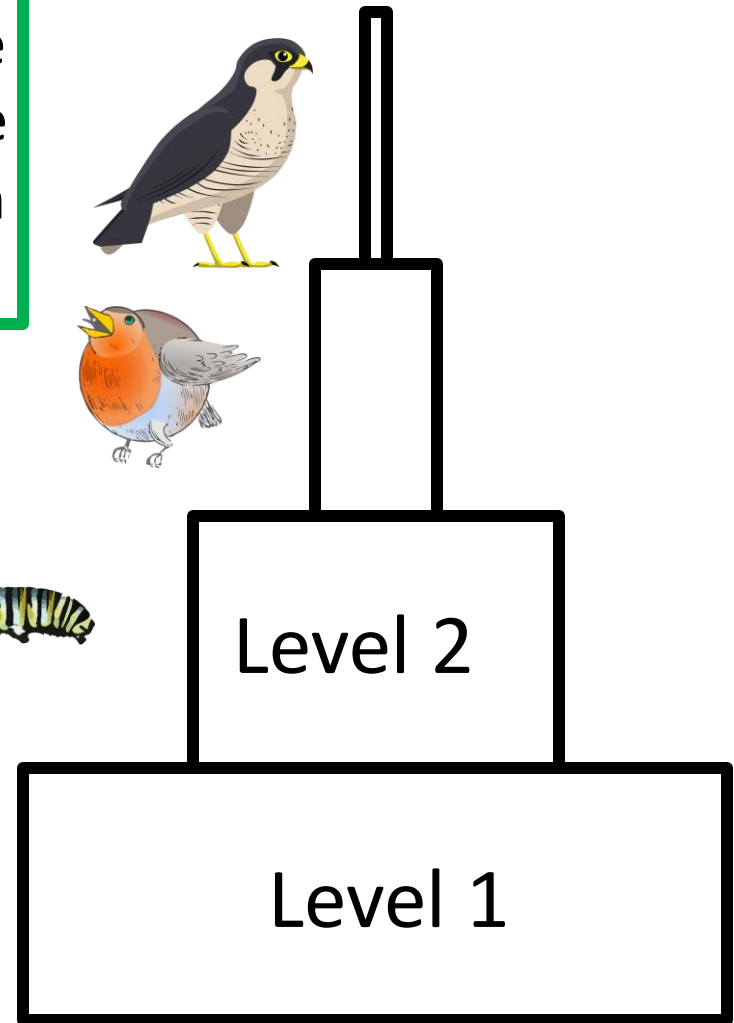
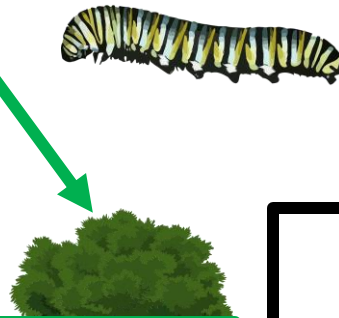


7.4.3 Transfer of Biomass

Pyramids of biomass can be constructed to represent the relative amount of biomass in each level of a food chain.

Producers are mostly plants and algae which transfer about 1 % of the incident energy from light for photosynthesis.

Trophic level 1 is at the bottom of the pyramid.



CS/F

CS/H

SS/F

SS/H



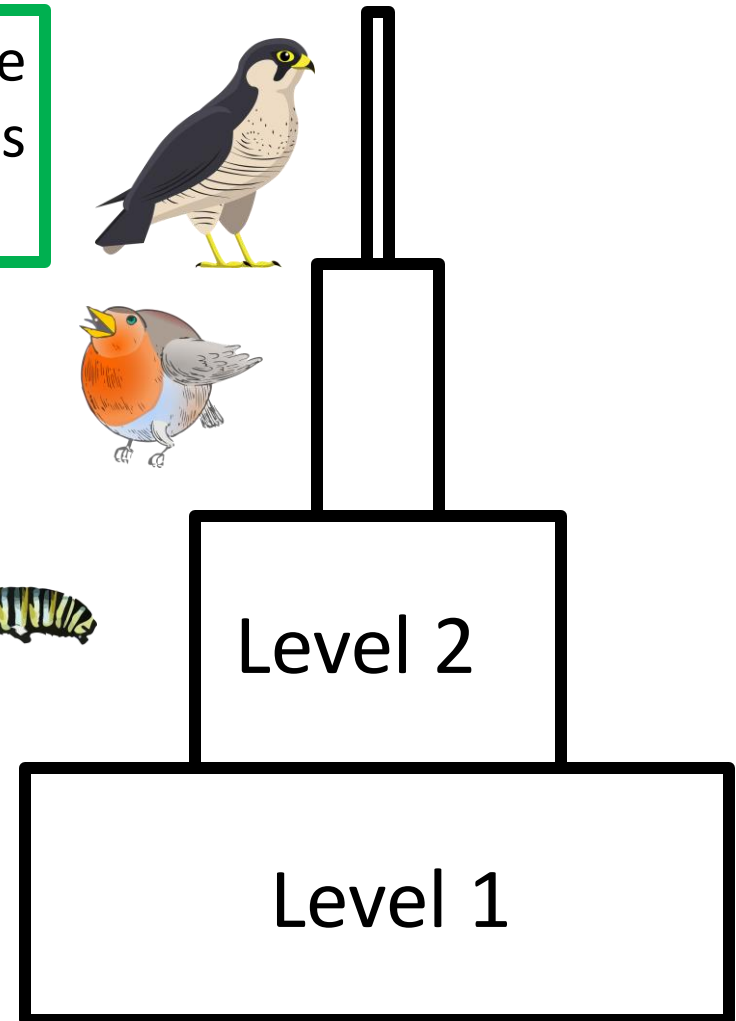
7.4.3 Transfer of Biomass

Only approximately 10 % of the biomass from each trophic level is transferred to the level above it.

Losses of biomass are due to:

Not all ingested material is absorbed, some is egested as faeces.

Some absorbed material is lost as waste such as carbon dioxide and water in respiration and water and urea in urine.



CS/F

CS/H

SS/F

SS/H

7.5.1 Food Security

Key Term	Definition
Food Security	

Biological factors which are threatening food security include:

Increasing Birth
Rate

New Pests and
Pathogens

Changing diets in
developed
countries means
scarce food
resources are
transported
around the world

Cost of
agricultural inputs

Conflicts in the
World

Environmental changes that affect
food production, such as
widespread famine occurring in
some countries if rains fail

CS/F

CS/H

SS/F

SS/H



7.5.2 Farming Techniques

The efficiency of food production can be improved by restricting energy transfer from food animals to the environment.

This can be done by limiting their movement and by controlling the temperature of their surroundings.

Some animals are fed high protein foods to increase growth.



7.5.2 Farming Techniques



Advantages	Disadvantages

CS/F CS/H SS/F SS/H

7.5.3 Sustainable Fisheries

Think

Pair

Share

Why is sustainable fishing important?

Fish stocks in the ocean are declining.

We need to maintain fish stock at a level where breeding continues otherwise a species may disappear.



7.5.3 Sustainable Fisheries



Think
Pair
Share

How can we conserve fish stocks?

Method of Conserving Fish Stocks	Explanation of How This Protects Fish Stock Levels

CS/F
CS/H
SS/F
SS/H

7.5.4 Role of Biotechnology

Think
Pair
Share

How can biotechnology be used to meet the demands of a growing human population?

We could use genetic modification.

Crops that have had their genes modified are called genetically modified crops.

This could include crops that are resistant to insects or to herbicides.

GM crops also generally have increased yields.



7.5.4 Role of Biotechnology

Think
Pair
Share

What other uses do we have for genetic modification?

Bacterial cells have been genetically engineered to make useful substances such as human insulin to treat diabetes.



CS/F

CS/H

SS/F

SS/H

7.5.4 Role of Biotechnology

Think

Pair

Share

How else can biotechnology be used?



The fungus *Fusarium* is useful for making mycoprotein.

This is a protein-rich food suitable for vegetarians.

The fungus is grown on glucose syrup, in aerobic conditions, and the biomass is harvested and purified.

CS/F

CS/H

SS/F

SS/H