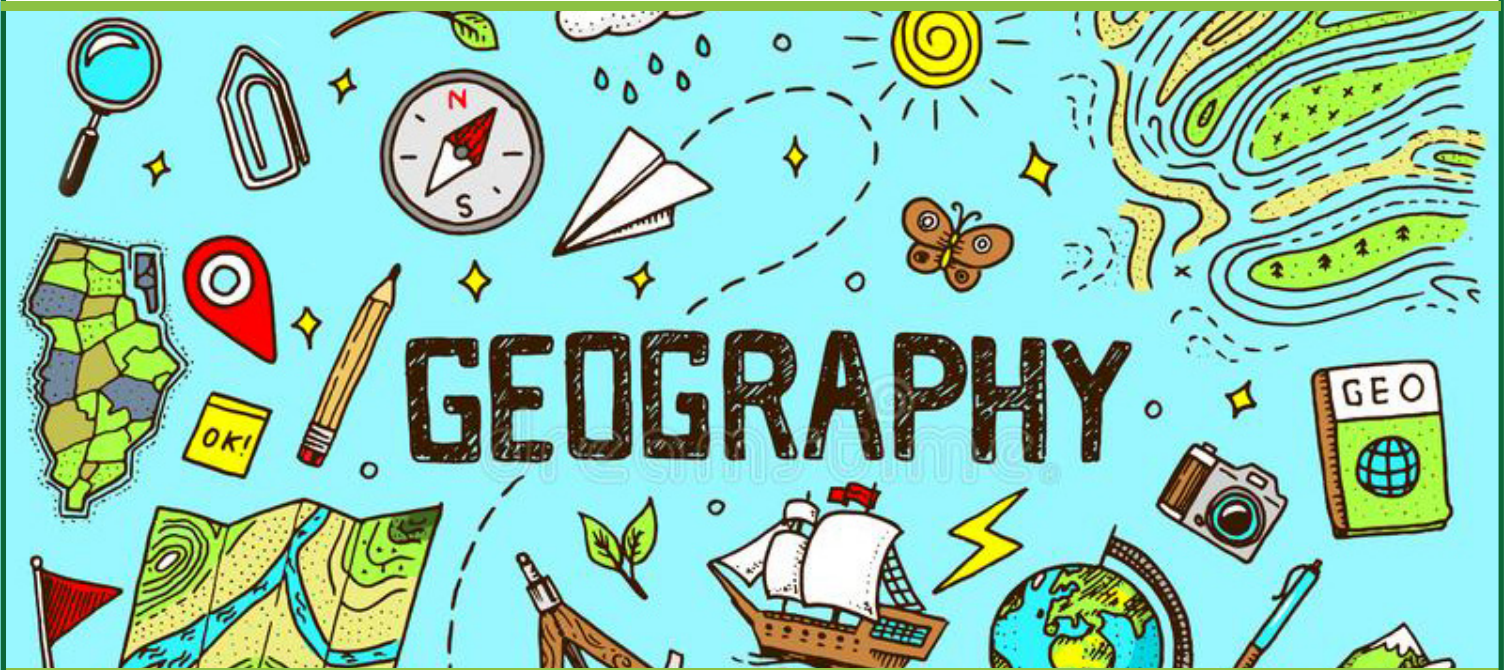




## Geography Bridging Work

Year 10 into 11 for 2023/24



Name: \_\_\_\_\_

Tutor Group: \_\_\_\_\_

Teacher: \_\_\_\_\_

## UNIT IN A BOOKLET

### The Living World.

Use the PPT and information sheets/resources to complete this booklet. The information and learning that you will complete will appear in the exam.

In order to check your understanding you will be given an end of topic test.

#### POWERPOINT 1: What is an Ecosystem?

Task 1: What is an ecosystem: \_\_\_\_\_

##### Ecosystem key terms

- Ecosystem – A \_\_\_\_\_ of plants (\_\_\_\_\_) and animals (\_\_\_\_\_) that interact with each other (living components) and their physical environment (non-living components, e.g. \_\_\_\_\_, \_\_\_\_\_, soil, water, and light).
- Producer – An organism or plant that is able to absorb energy from the \_\_\_\_\_ through \_\_\_\_\_ (making sugars). It also needs \_\_\_\_\_, carbon dioxide and nutrients from soil/rock to produce what it needs for itself.
- Consumer – Creature that \_\_\_\_\_ herbivores and/or plant matter. They obtain the \_\_\_\_\_ from what they eat, e.g. if they eat a producer they will get the \_\_\_\_\_ they made.
- Decomposer – An organism such as a \_\_\_\_\_ or fungus, that \_\_\_\_\_ down dead tissue, which effectively \_\_\_\_\_ their nutrients back to the environment.
- Food chain – The connections between different organisms (plants and animals) that \_\_\_\_\_ upon one another as their source of food.
- Food web – A \_\_\_\_\_ hierarchy of plants and animals relying on each other for food.
- Nutrient cycling – A set of processes whereby organisms extract \_\_\_\_\_ (e.g. nitrogen, potash, and potassium) necessary for \_\_\_\_\_ from soil or water, before \_\_\_\_\_ them on through the food chain – and ultimately back to the soil and water when they \_\_\_\_\_.

Task 2: use the PDF of the Ecosystems information sheet to answer the following questions:

1. Describe two biotic aspects, two abiotic and one mixed of an ecosystem.
2. Describe the two types of interrelationships that take place within the ecosystem.
3. What are the inputs and outputs in an ecosystem?
4. Define the ecosystem sizes shown in the images. Give examples to support your answer.
5. Complete the missing parts of the food web.
6. Define the following biotic parts of an ecosystem: producer, herbivore, carnivore and top carnivore.
7. Describe the interrelationships between the parts of the food chain.
8. Complete the nutrient cycle diagram to show how nutrients travel between the biomass, litter and soil.

**Practice Exam Questions.**

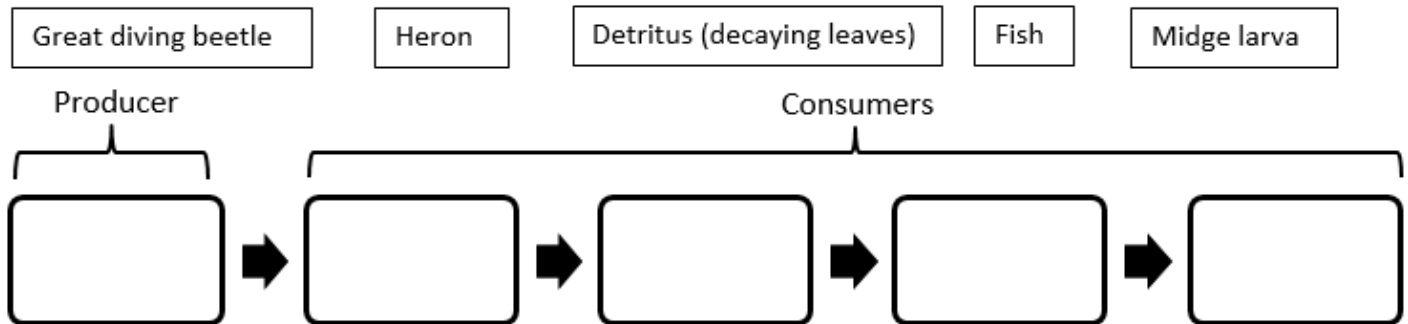
**Describe the difference between abiotic and biotic parts of an ecosystem. (4 marks)**

### Task 3: Small UK ecosystem (fresh water)

#### Small-scale UK ecosystem: Freshwater food chain and web

##### Food chain

Add the names below to the correct part of the food chain



##### Food web

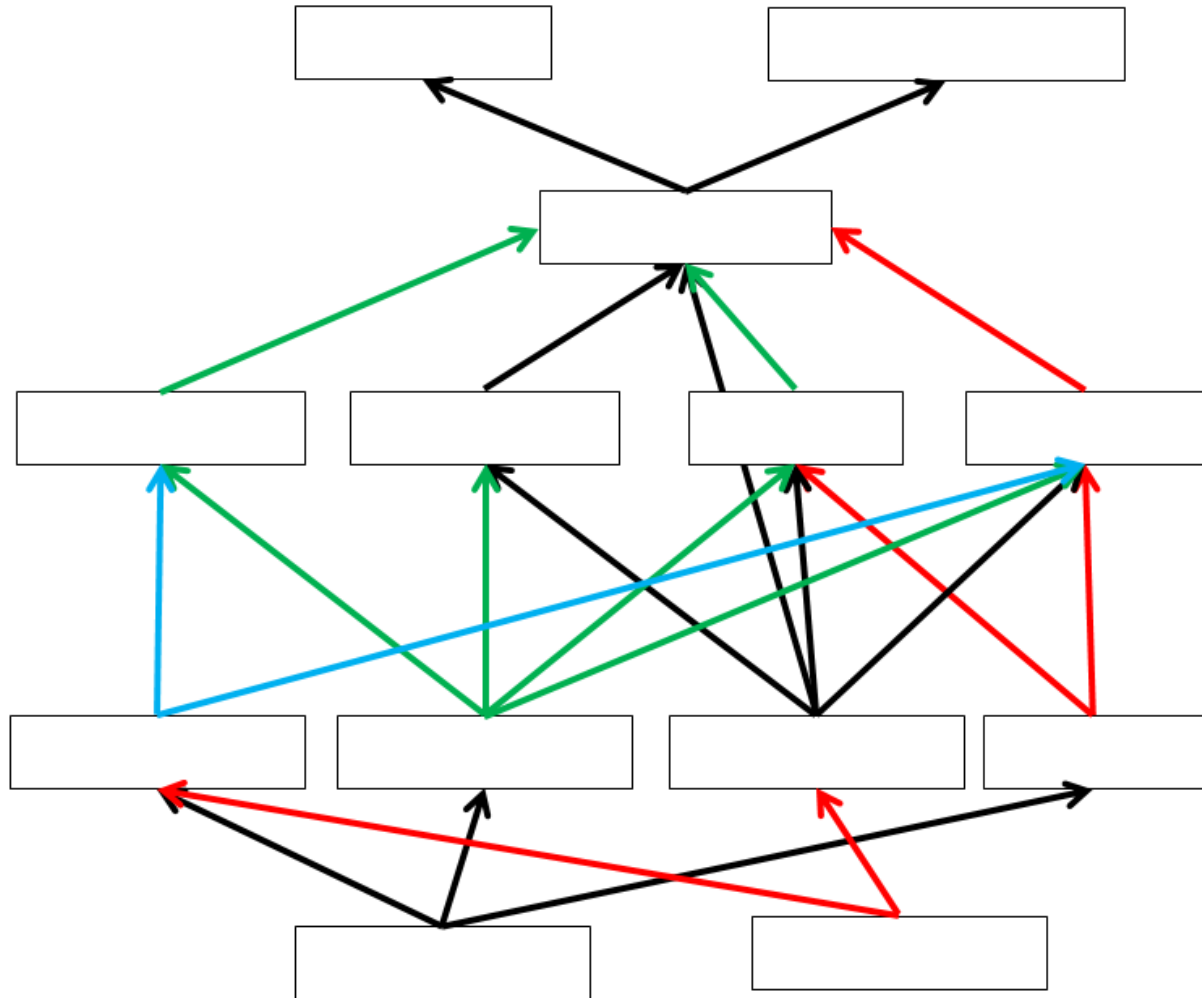
Using the table below complete a food web. Look for the producers and top consumers to help you start and then use the energy sources to figure out where the rest go. Remember arrows point to what is being eaten.

Species	Energy source (food or sunlight)
Algae and microscopic plants	Sunlight
Blackfly	Detritus
Caddis (small moth-like insect)	Mayfly, Blackfly
Detritus (decaying matter and waste)	Sunlight
Dragonfly	Worms, Mayfly, Blackfly, Midge larva
Fish	Mayfly, Caddis, Stonefly, Great diving beetle, Dragonfly
Great diving beetle	Midge larva, Blackfly
Heron	Fish
Kingfisher	Fish
Mayfly	Algae and microscopic plants
Midge larva	Detritus, Algae and microscopic plants
Stonefly	Blackfly, Mayfly
Worms	Detritus

##### Practice Exam Questions.

Explain the role of the decomposers in the ecosystem nutrient cycle. (6 marks)

# Freshwater food web



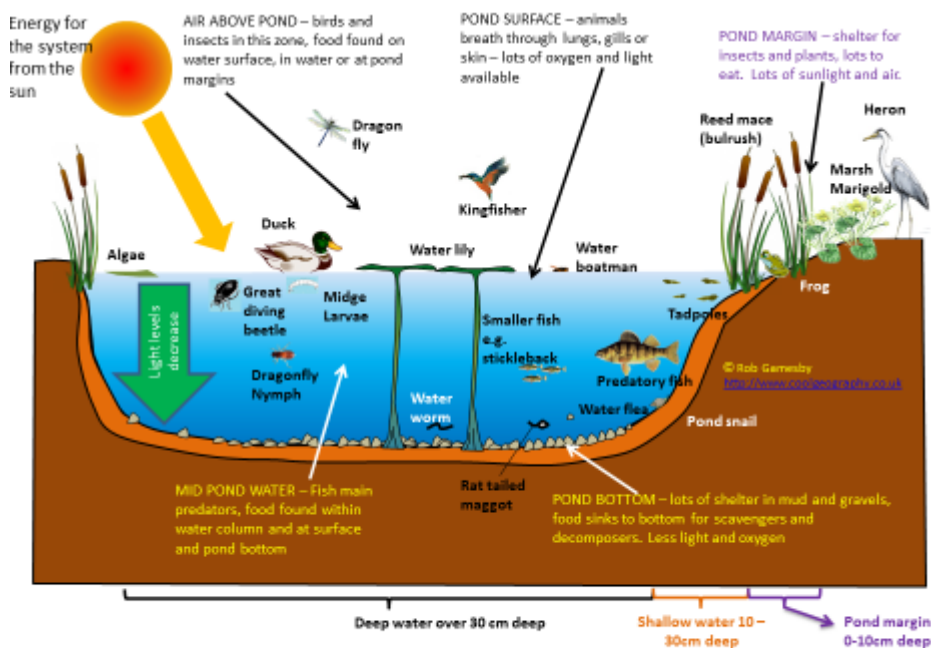
Task 4: What is the impact of changing one component on the ecosystem?

Study the food chain above and complete the following questions. What would happen if:

1. A disease wiped out all of the Mayfly?
2. The number of Dragonfly increased?
3. The number of Dragonfly decreased?
4. The detritus was cleared from the pond?

## Task 5: A freshwater pond: A small-scale UK ecosystem

Study the diagram on the PPT (slide 10) or the diagram below. Answer the questions related to it:



1. What are the living (biotic) and non-living (abiotic) components in this ecosystem?
2. What producers are there?
3. What consumers are there?

### Practice Exam Questions.

Explain the relationship between the producers, consumers and secondary consumers of an ecosystem. (6 marks)

## **POWERPOINT 2: What is the small-scale ecosystem of Epping forest like?**

Task 1: Describe the forest ecosystem shown in the image below using the words shown in the wordphoto.

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**Task 2: Read slides 5 to 8 and complete the wiki outline on the next page.**

Task 3: Answer the questions below in bullet points:

Describe two reasons characteristics of a small scale you have studied. (4 marks)

Explain the characteristics of the food web of a small-scale ecosystem you have studied. (6 marks)

Explain the interdependence that exists within a small-scale ecosystem you studied. (6 marks)



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#### Learning tools

Grades 1-3- [describes the features of Epping Forest](#)

Grades 4-6- [use of key terminology](#) to describe.

Grades 7-9- [explains the links in the ecosystem.](#)

#### Definition tools

[Interdependence](#)- the reliance of the parts of an [ecosystem](#) on each other

[Nutrient cycle](#)- on going recycling of nutrients between living [organisms](#) and their environment.

[Producer](#)- an organism or plant that is able to absorb energy from the sun through [photosynthesis](#)

[Food web](#)- a complex hierarchy of plants and animals relying on each other for food.

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## Epping Forest ecosystem, UK

From Wikipedia, the free encyclopedia

**Epping Forest** is located east of London. It is all that remains of a larger forest which colonised England at the end of the last ice Age.

**Characteristics of Epping Forest**    How is the forest ecosystem structured?



**Epping Forest**

### Task Bank

Write a description of the ecosystem characteristics of Epping Forest.

Explain how the producers, consumers and decomposers are all reliant on each other in Epping Forest. Give a specific example.

Draw a diagram and explain the nutrient cycle which takes place within the ecosystem of Epping Forest.

**Epping Forest's food web**

# How do changes affect the balance of an ecosystem?

Identify two forces of change in an ecosystem. Draw a diagram to show a food web that is supported by an oak tree. Explain how removing a component of a food web will cause change. Give an example of an ecosystem that you have studied and explain how it is being restored.

What causes change in an ecosystem? (Think about how nature and human activity would cause an imbalance).

Draw a diagram to show a food web supported by an oak tree.



Circle a component of the food web. Explain how removing that component would impact on the ecosystem. (Think about what would flourish, what would decline, alternative food provisions and the

Give an example of an ecosystem that you have studied and explain how it being restored. (Think about why it needs restoring, the reasons for this particular management method and the benefits of the management method.)

## POWERPOINT 3: Factors affecting ecosystem

Task 1: Using the information about the factors that affect the ecosystems balance (slides 3 to 5) complete the activities in the boxes.

Task 2: Answer the following exam question (you can use slide 6 to help):

Using a named example, explain how change can have short-term and long-term effects on an ecosystem. (6 marks)

#### **POWERPOINT 4: World Biomes**

Task 1: Watch this short introduction to large-scale ecosystems (biomes) -

[http://www.bbc.co.uk/schools/gcsebitesize/geography/ecosystems/biomes\\_video.shtml](http://www.bbc.co.uk/schools/gcsebitesize/geography/ecosystems/biomes_video.shtml)

Biomes are large-scale ecosystems defined by abiotic factors:

- Climate (temperature and precipitation)
- Relief (steepness of the land)
- Geology (type of rocks)
- Soils (fertility)
- Vegetation (type and coverage)

Give an example of 2 global biomes and reasons for it:

Task 2: Use slide 2 to help explain the location of the world's biomes using an example (s). (4 marks)

Task 3: Use the information on slides 4 to 8 to **locate, describe/explain the climate** and **describe the characteristics** of each biome.

**What are the characteristics of the world's biomes?**

**Polar**

**Deciduous Forest**

**Tundra**

**Desert**

**Tropical rainforest**

**Coniferous forest**

**Savanna**

**Temperate grassland**

**Mediterranean**

Summary of the location of the world's biomes

Legend:

- Tropical forest
- Boreal forest
- Savanna
- Tundra
- Desert
- Mountains
- Chaparral
- Polar ice
- Temperate forest
- Temperate grassland

Task 4: Complete this table using the biomes from your map – you will need to look for the clues! Your map may help you.

Climate zone name?	Description of the climate and of the resulting vegetation
	Also known as the taiga, this biome is a northern coniferous (evergreen) forest. It is a cold woodland found north of temperate deciduous forests. It is the largest biome - covering about 17% of the Earth's land area and can be found in Canada, Europe, Asia, and the United States
	This biome has few extremes of climate and can be found in the eastern half of North America, and the west of Europe. It can also be found in Asia. The forest has four distinct seasons, spring, summer, autumn, and winter. In the autumn the leaves change colour. During the winter months the trees lose their leaves.
	This biome covers one-fifth of the land on earth – there is little precipitation, a short growing season; and poor nutrients. It is below freezing at night year round and the meaning of its name comes from Lappish language (Lapland) which means "land with no trees".
	A large biome with rolling terrains of grasses, flowers and herbs. It is a region where the average annual precipitation is great enough to support grasses, and in some areas a few trees. The precipitation is so unpredictable that drought and fire prevent large forests from growing.
	This is a very hot and wet biome located on or around the equator. It has the greatest biodiversity (number of plants and animals) found anywhere on earth.
	This biome is very hot and also very, very dry. As a result of this very little grows – only very hardy plants such as cactus which can survive drought.
	This is a biome that is found in small areas on of most of the continents - the west coast of the United States, the west coast of South America, the Cape Town area of South Africa, the western tip of Australia and the coastal areas of the Mediterranean. This biome has flat plains, rocky hills and mountain slopes. It is very hot and dry - the winter is very mild (usually about 10 °C), the summer is so hot and dry at 40 °C that fires and droughts are very common.
	A dry and hot area composed of mainly grassland and scattered shrubs and isolated trees, which can be found between a tropical rainforest and desert biome in Africa, Arabia and even Australia

Task 5: use slide 10 to help answer the exam question:

Describe the global distribution of the tundra biome. (4 marks)

## Define...What is an ecosystem?

Give me a definition not examples...

## These words might help you...



Challenge: can you give an example of a small scale and large scale ecosystem?

An ecosystem- is a biological community of interacting organisms and their environment

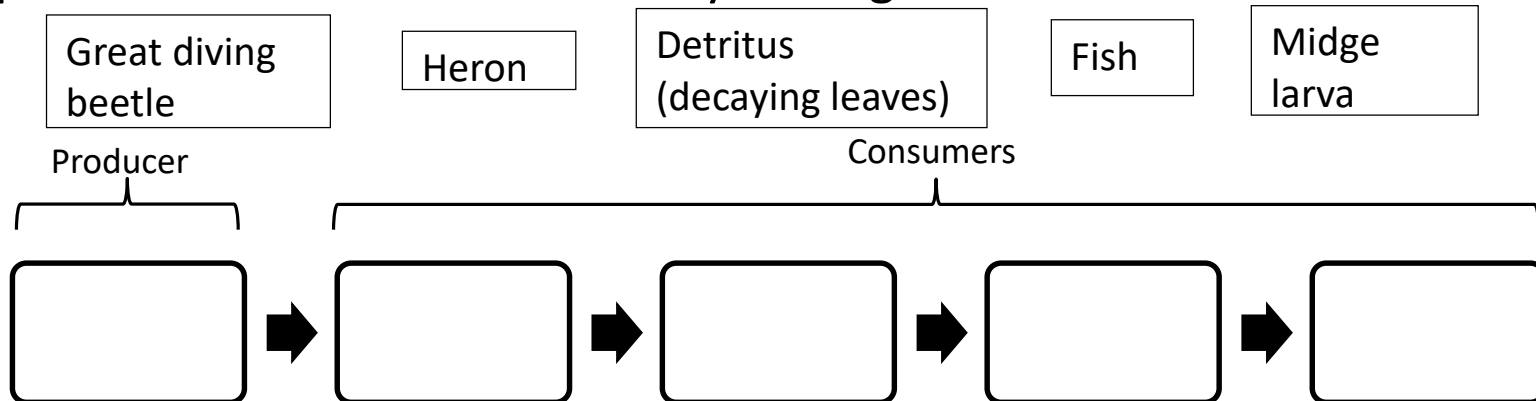
# Task 1: Copy the key terms

- **Ecosystem** – A community of plants (flora) and animals (fauna) that interact with each other (living components) and their physical environment (non-living components, e.g. temperature, rainfall, soil, water, and light).
- **Producer** – An organism or plant that is able to absorb energy from the sun through photosynthesis (making sugars). It also needs water, carbon dioxide and nutrients from soil/rock to produce what it needs for itself.
- **Consumer** – Creature that eats herbivores and/or plant matter. They obtain the energy from what they eat, e.g. if they eat a producer they will get the sugars they made.
- **Decomposer** – An organism such as a bacterium or fungus, that breaks down dead tissue, which effectively recycles their nutrients back to the environment.
- **Food chain** – The connections between different organisms (plants and animals) that rely upon one another as their source of food.
- **Food web** – A complex hierarchy of plants and animals relying on each other for food.
- **Nutrient cycling** – A set of processes whereby organisms extract nutrients (e.g. nitrogen, potash, and potassium) necessary for growth from soil or water, before passing them on through the food chain – and ultimately back to the soil and water when they die.

8. Complete the nutrient cycle diagram to show how nutrients travel between the

## Task 3: Freshwater food chain and food web

1. Complete a freshwater food chain by adding the names into the correct box.



2. Complete a freshwater food web using the table of information

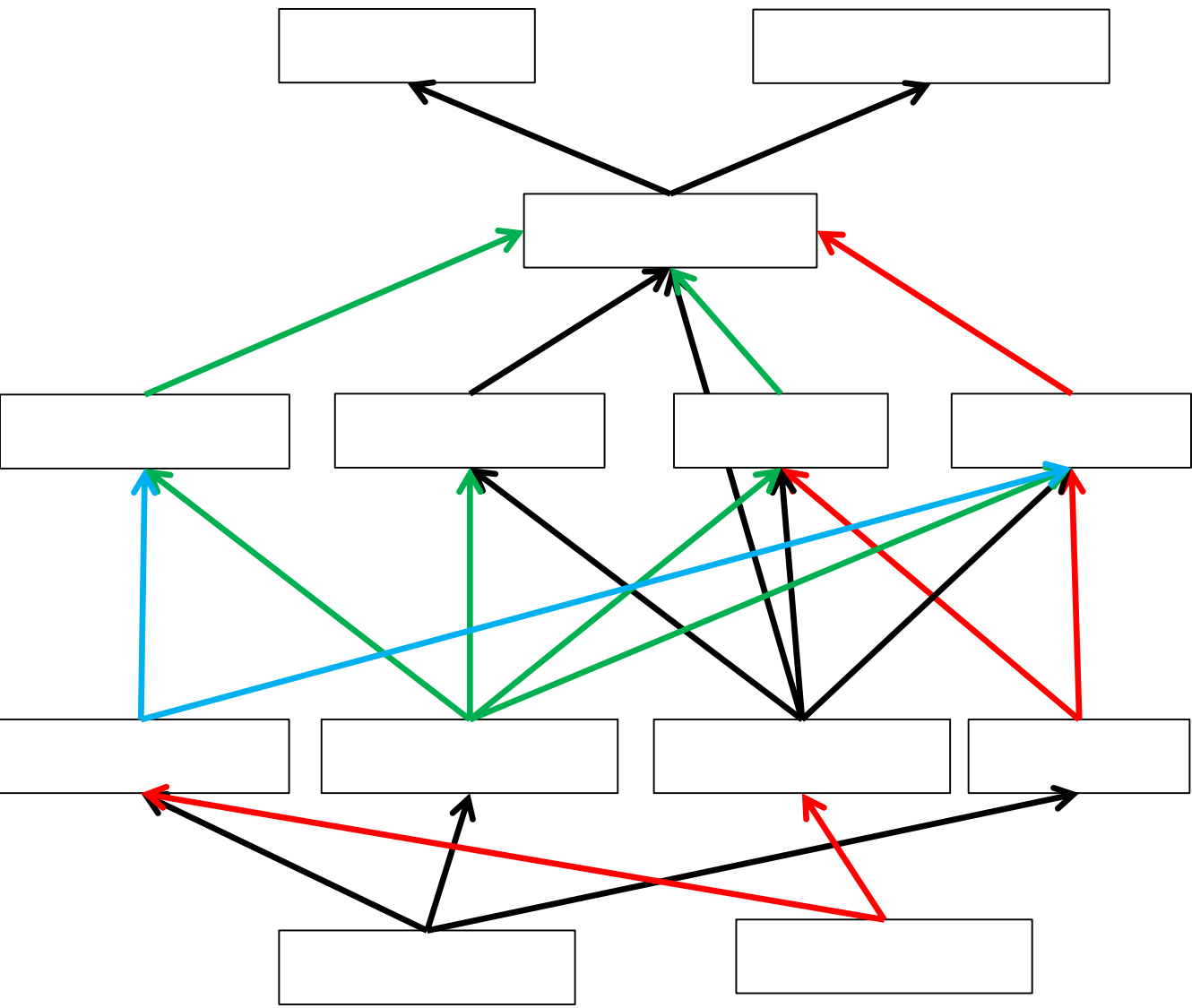
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Algae and microscopic plants	Sunlight
Blackfly	Detritus
Caddis (small moth-like insect)	Mayfly, Blackfly
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Great diving beetle	Midge larva, Blackfly
Heron	Fish
Kingfisher	Fish
Mayfly	Algae and microscopic plants
Midge larva	Detritus, Algae and microscopic plants
Stonefly	Blackfly, Mayfly
Worms	Detritus

Hint: Start with the producers and top consumers

**Extension: how could human beings change how this ecosystem functions?**

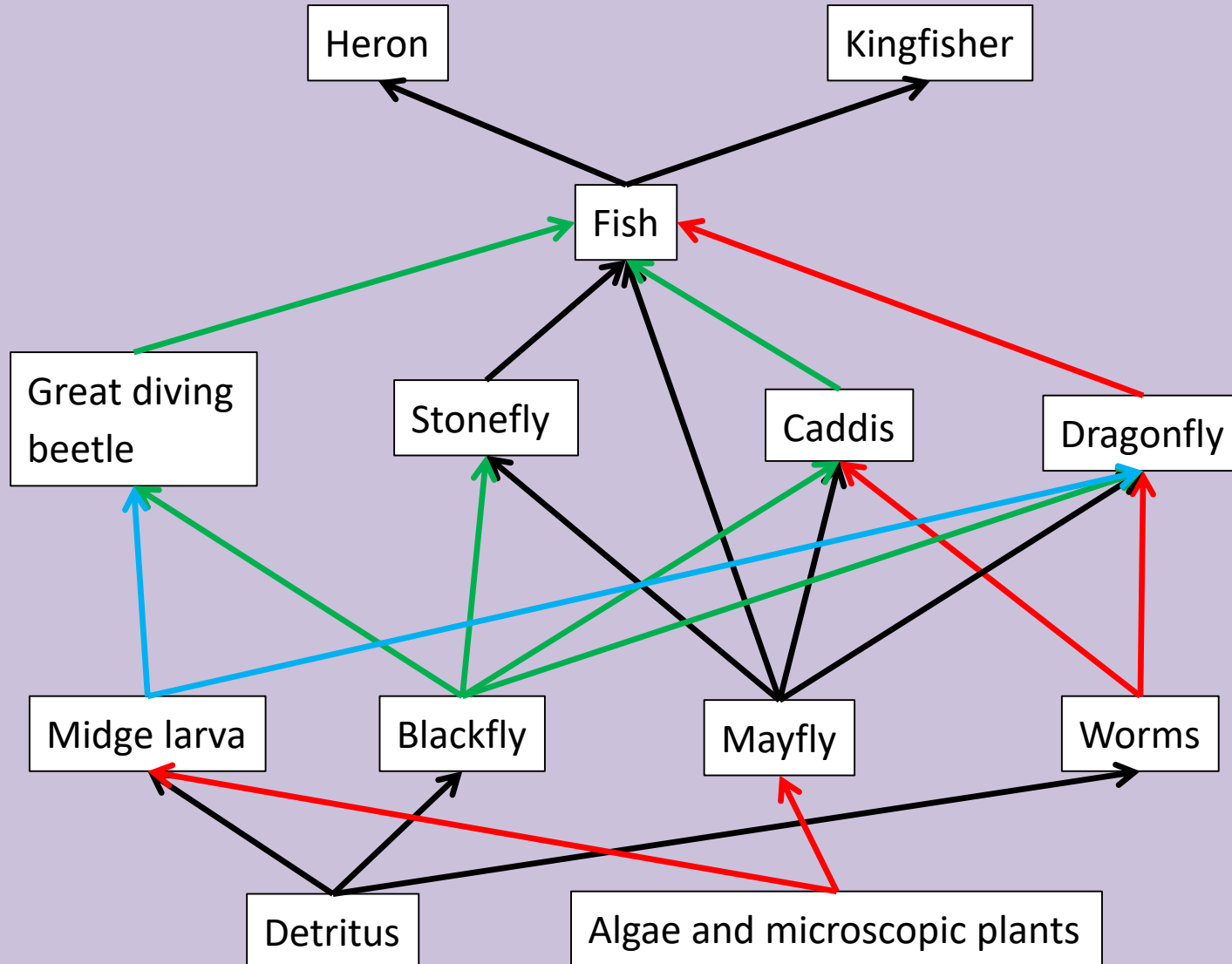


# Freshwater food web



Species	Energy source (food or sunlight)
Algae and microscopic plants	Sunlight
Blackfly	Detritus
Caddis (small moth-like insect)	Mayfly, Blackfly
Detritus	Sunlight
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Midge larva	Detritus, Algae and microscopic plants
Stonefly	Blackfly, Mayfly
Worms	Detritus

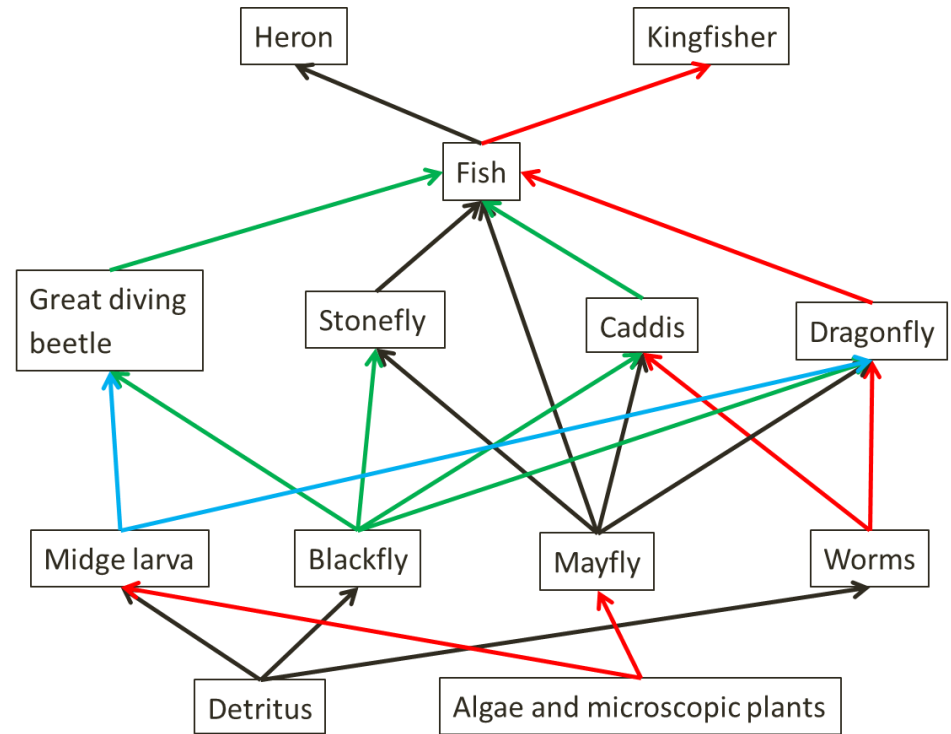
# Freshwater food web



## Task 4: What's the impact of changing one component on the ecosystem?

What would happen if;

1. A disease wiped out all of the Mayfly?
2. The number of Dragonfly increased
3. The number of Dragonfly decreased
4. The detritus was cleared from the pond



# A freshwater pond: A small-scale UK ecosystem

Freshwater ponds provide a variety of habitats for plants and animals.

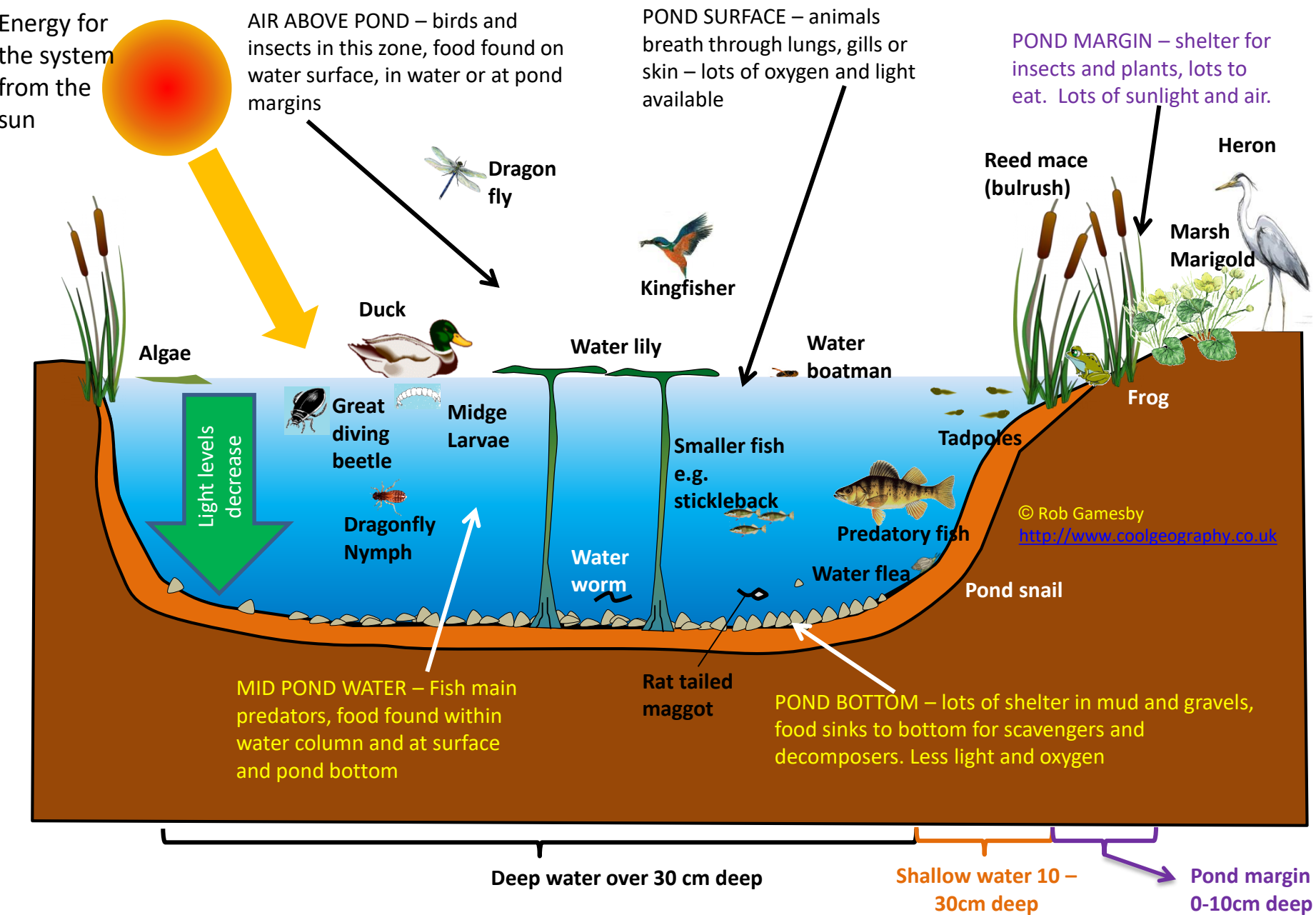
There are considerable variations in the amount of light, water and oxygen available in different parts of the pond.

Animals living at the bottom in deep water need different adaptations to those living on the margins of the pond, e.g. water lilies send their flowering stems to the water surface when they are submerged but reeds can only cope in dry conditions at the margin of the pond.

Look at the picture of a freshwater pond. Discuss in pairs;

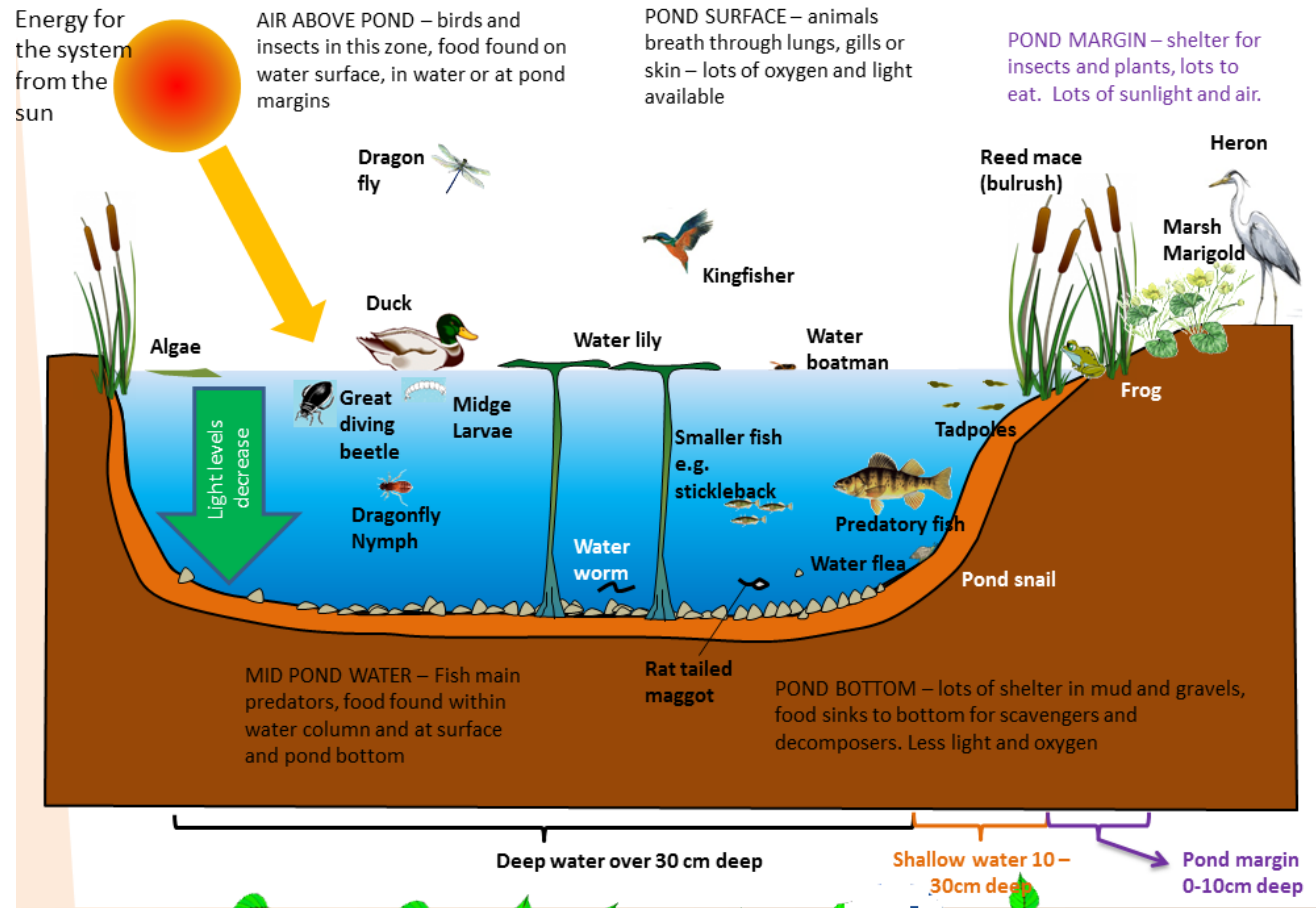
1. The FACTORS that will affect this ecosystem
2. The DIFFERENT habitats that will exist WITHIN the ecosystem





# Task 5: A freshwater pond: A small-scale UK ecosystem

1. What are the living (biotic) and non-living (abiotic) components in this ecosystem?
2. What producers are there?
3. What consumers are there?



# Task 6: Exam questions

## Level 1

- You demonstrate limited knowledge of ecosystems.
- You demonstrate a limited ability to use key terms.

## Level 2

- You demonstrate a clear knowledge of how ecosystems work.
- You are able to use some place specific detail.
- You are able to use key terms correctly.

## Level 3

- You demonstrate detailed knowledge of how ecosystems work.
- You are able to use place specific detail thoroughly.
- You are able to use key terms consistently correctly.

## Advice

- ✓ Use examples
- ✓ Use key terminology
- ✓ Make links between points
- ✓ Use point, example, explain, link to structure your answer



Describe the difference between abiotic and biotic parts of an ecosystem.

(4 marks)

Explain the role of the decomposers in the ecosystem nutrient cycle.

(6 marks)

Explain the relationship between the producers, consumers and secondary consumers of an ecosystem.

(6 marks)

## Key words

Water

Transport  
Energy

Recycling

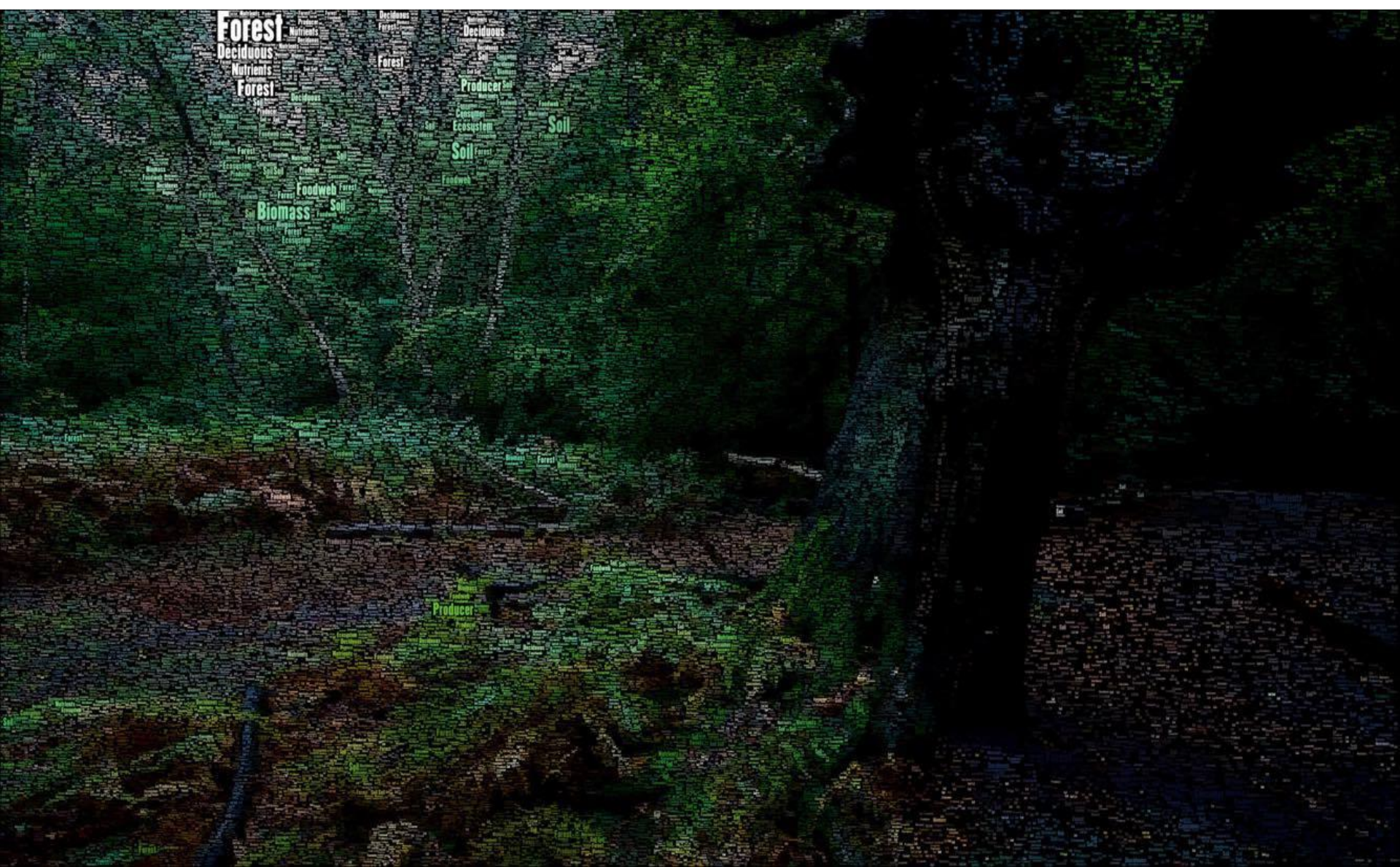
Ecological footprint  
Green space

Transport



# Task 1

Describe the forest ecosystem shown in the image below using the words shown in the wordphoto.



# What is the small-scale ecosystem of Epping Forest like?

## Learning Objectives:

All: To be able to describe the features of a small scale ecosystem.

Most: To be able to explain the interdependent relation of the features of Epping Forest.

Some: To be able to suggest how changes could affect the interdependent relationships of the ecosystem.

# What are the characteristics of Epping Forest?



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Learning tools  
Grades 1-3- describes the features of Epping Forest  
Grades 4-6- use of key terminology to describe.

Grades 7-9- explains the links in the ecosystem.

Definition tools

**Interdependence**- the reliance of the parts of an **ecosystem** on each other

**Nutrient cycle**- on going recycling of nutrients between living **organisms** and their environment.

**Producer**- an organism or plant that is able to absorb energy from the sun through **photosynthesis**.

**Food web**- a complex hierarchy of plants and animals relying on each other for food.

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## Epping Forest ecosystem, UK

From Wikipedia, the free encyclopedia

**Epping Forest** is located east of London. It is all that remains of a larger forest which colonised England at the end of the last ice Age.

## Characteristics of Epping Forest How is the forest ecosystem structured?

## Nutrient cycle in the forest

## Interdependence How are the producers, consumers and decomposers all interdependent?

### Epping Forest



#### Task Bank

Write a description of the ecosystem characteristics of Epping Forest.

Explain how the producers, consumers and decomposers are all reliant on each other in Epping Forest. Give a specific example.

Draw a diagram and explain the nutrient cycle which takes place within the ecosystem of Epping Forest.

#### Epping Forest's food web



Literacy



Extensio

Can you use these key terms:

Nutrient cycle  
Decomposers  
Consumers

Can you summarise the factors that;

- Could affect the good food web
- Could affect the nutrient cycle
- Could affect the characteristics of Epping Forest

**In no more than 10 words summarise Epping Forest.**

### Task 1

Describe the location of Epping Forest and draw a map. Describe the characteristics of Epping Forest.

### Task 2

Draw and describe the nutrient cycle which takes place within the ecosystem of Epping Forest.

### Task 1

Draw the food web of Epping Forest. Describe at least 2 of the links between the producers and consumers within the web.

### Task 3

Describe how producers, consumers and decomposers are all reliant on each other.

# Where is Epping Forest?

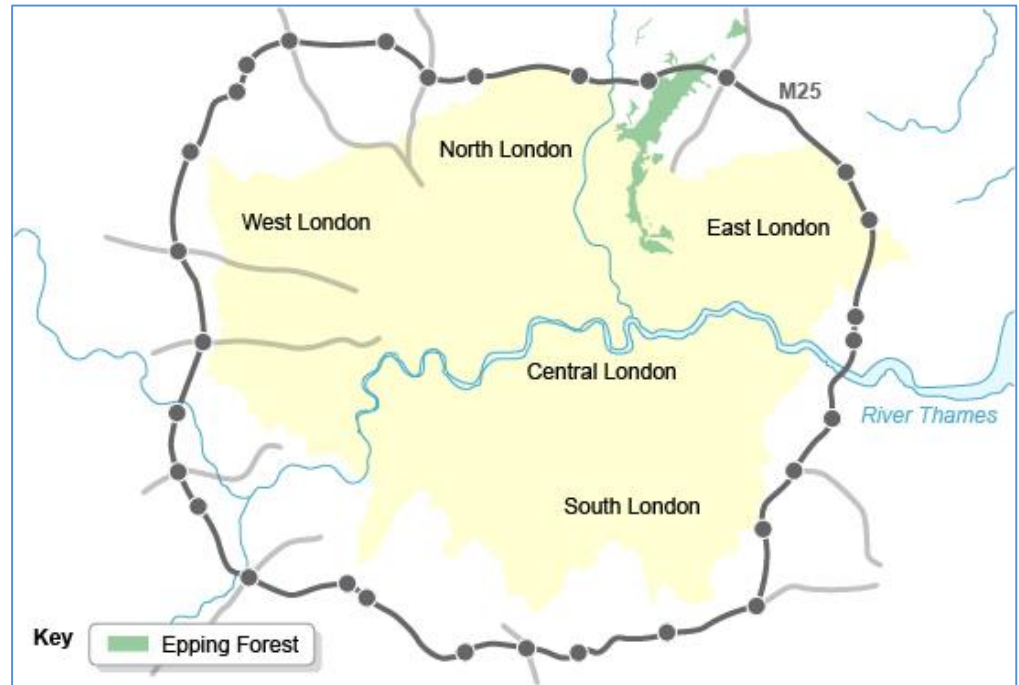
Epping Forest is located east of London. It is all that remains of a larger forest that colonised England at the end of the last Ice Age.

Bogs and ponds in the forest have their own unique species, including 20 kinds of dragonfly.

For 1,000 years, Epping Forest has been managed in a variety of ways: as hunting grounds for royalty, a timber resource and, nowadays, recreation as it is so easily accessible by car and the M25.

It covers 2,476 hectares and contains areas of woodland, grassland, heath, rivers, bogs and ponds, and most of it is a Site of Special Scientific Interest and a Special Area of Conservation.

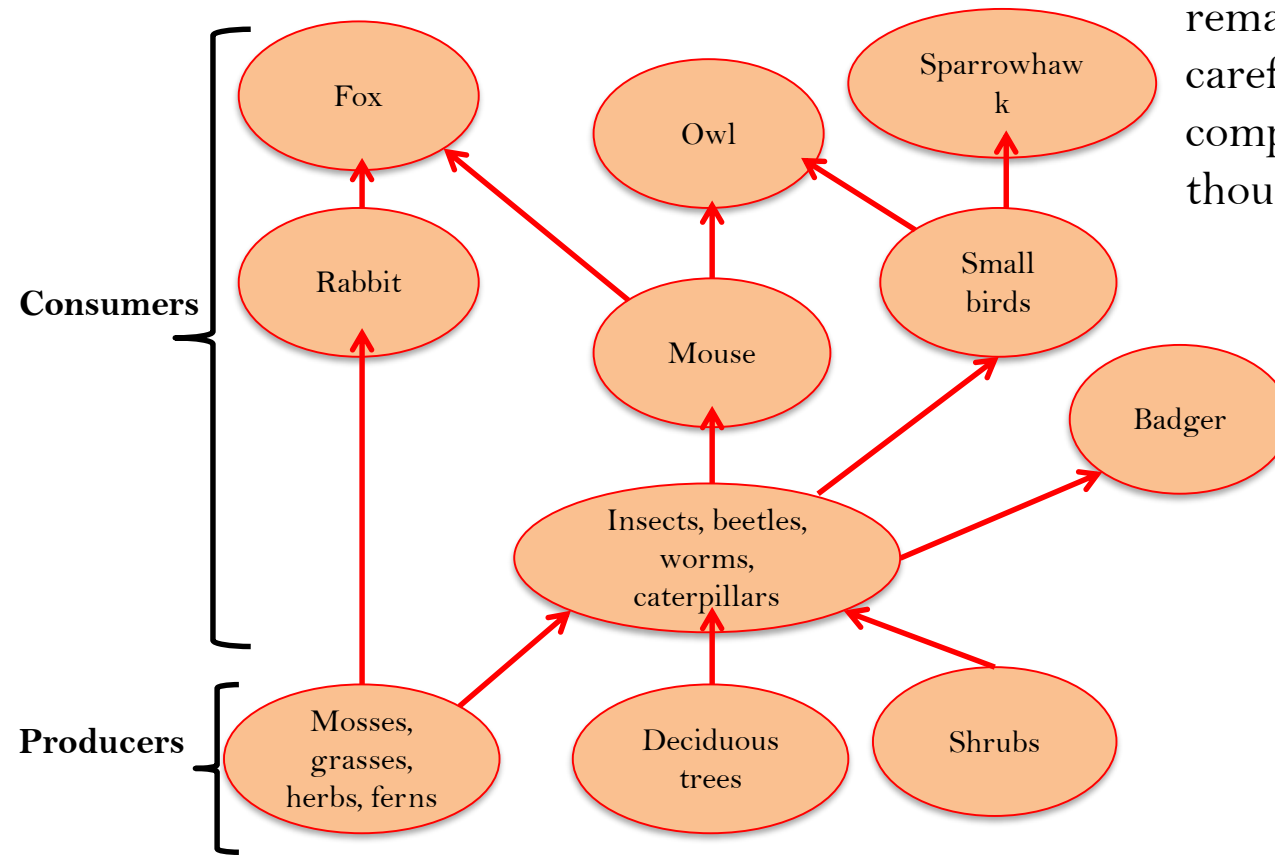
Figure 2- Location of Epping Forest



Stretching between Forest Gate in the south and Epping in the north, Epping Forest is approximately 19 kilometers long in the north-south direction, but no more than 4 kilometers from east to west at its widest point, and in most places considerably narrower.

# What are the characteristics of Epping Forest's food web?

Figure 3- Epping Forest food web



Biodiversity in the forest has remained naturally high, thanks to careful management, so there is a complex food web composed of thousands of species.

Epping forest is home to:

- A large number of native tree species, including oak, elm, ash and beech.
  - A lower shrub layer of holly and hazel five meters, overlaying a field layer of grasses, brambles, bracken, fern and flowering plants; 177 species of moss and lichen grow here. Although there is great diversity of producer species.
- Many insect, mammal and bird consumer species are supported, including nine amphibian and reptile species and 38 bird species.
  - Studies have found 700 species of fungi, which are important decomposers.

# How is the ecosystem interdependent?



Figure 4- Leaves on the forest floor

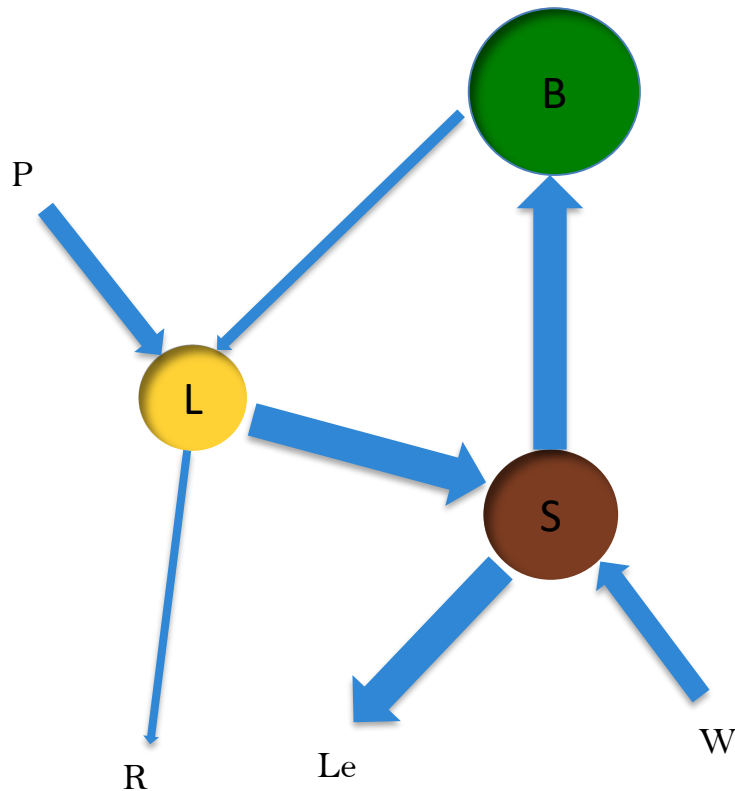
By mid-autumn, the forest floor is covered with a thick layer of leaves. Remarkably, by spring, the leaf litter has all but disappeared; the decomposers and detritivores' work is now complete. Nutrients stored in the leaves are now converted into humus in the soil, ready to support the new seasons plant growth. This will ultimately include the fruits and berries that in turn support many primary consumers.

The forest's producers, consumers and decomposers are all interdependent. This is the most clearly shown by the annual life cycle of the trees.

Most of the trees are deciduous, meaning that they lose their leaves in winter. This is an adaptation to the UK's seasonal climate. Winters are darker and cooler than summers (the mean monthly temperature is  $18^{\circ}\text{C}$  in July but just  $5^{\circ}\text{C}$  in January. As a result the trees grow broad leaves in spring. This allows them to maximise photosynthesis during the summer. They shed their leaves in the autumn, and so conserve their energy during winter.

# What explains the characteristics of the nutrient cycle?

Nutrient cycling demonstrates clearly the interdependence of plants, animals and soil. People and ecosystem components are interdependent too. In the past, coppicing (cutting back trees to encourage new growth of wood). Today visitors pick berries and flowers. In turn, this helps spread the seeds, which stick to their clothing.



In figure 5 which reflects Epping Forest, the biomass store is large because of the great height of the trees and large dense undergrowth beneath them.

The soil store is large too because there is always plenty of humus.

The high flow rates between the litter, soil and biomass stores reflect the vigorous cycle of new growth that takes place each year. The forest also loses a lot of nutrients each year, via leaching, during episodes of heavy rainfall.

Figure 5- Epping Forest nutrient cycle

### Level 1

- You demonstrate limited knowledge of a small scale ecosystem.
- You demonstrate a limited ability to use key terms.

### Level 2

- You demonstrate a clear knowledge of a small scale ecosystem.
- You are able to use some place specific detail.
- You are able to use key terms correctly.

### Level 3

- You demonstrate detailed knowledge of small scale ecosystem.
- You are able to use place specific detail thoroughly.
- You are able to use key terms consistently correctly.

### Advice

- ✓ Use examples
- ✓ Use key terminology
- ✓ Make links between points
- ✓ Use point, example, explain, link to structure your answer

# Exam questions...



Describe two reasons characteristics of a small scale you have studied.

(4 marks)

Explain the characteristics of the food web of a small scale ecosystem you have studied.

(6 marks)

Explain the interdependence that exists within a small scale ecosystem you studied.

(6 marks)

### Key words

Regeneration Revenue Regeneration  
Green grid Underground  
Interdependent Congestion



# What factors affect the balance of an ecosystem?

Learning Objectives:

To develop a greater understanding of how the balance of an ecosystem can change.

To develop greater knowledge of the human and physical factors that can affect an ecosystem.

# Task 1: How do changes affect the balance of an ecosystem?

Using the information about the factors that affect the ecosystems balance complete the activities in the boxes.

**What causes change in an ecosystem?** (Think about how nature and human activity would cause an imbalance).

**Draw** a diagram to show a food web supported by an oak tree.



**Circle** a component of the food web. **Explain** how removing that component would impact on the ecosystem. (Think about what would flourish, what would decline, alternative food provisions and the

**Give** an example of an ecosystem that you have studied and **explain** how it being restored. (Think about why it needs restoring, the reasons for this particular management method and the benefits of the management method.)



Literacy

Can you use these key terms:

- Extinction
- Climate change
- Deforestation
- Soil erosion
- Consumer
- Producer
- Ecosystem restoration
- Ecosystem balance
- Decline
- Populations



Extension

Research how the ecosystem of Epping Forest has been restored by the grazing of cattle. Explain how the grazing has affected the ecosystem components.

*Identify* and *describe* two forces of change in an ecosystem.

*Draw* a diagram to show a food web that is supported by an oak tree.

*Explain* how removing a component of the food web will cause change.

*Give* an example of an ecosystem you have studied and *explain* how it has been restored.

# How do physical and human forces affect the balance?

Periods of extreme weather of climate change can disturb the balance of ecosystems. In the years 1976-77, southern England experienced an 18 month drought that killed many trees. A further 15 million English trees were felled by a great storm in 1987. As a result, population numbers declined for many consumer species in the food chain. Secondary forest growth has since taken place, however, and consumer species have migrated back. The recent recovery of English woodland is an example of ecosystem resilience.

Ecosystems are sometimes damaged in permanent ways, especially when human forces are involved, for instance by deforestation. The removal of forest exposes the soil beneath to rainfall, and so it can be washed away making it impossible for the ecosystem to recover.

In the long term human induced climate change could threaten the ecosystem balance of many places. Changes in temperature and precipitation patterns for southern England might make it harder for Ecosystems like Epping Forest to survive in their current form.



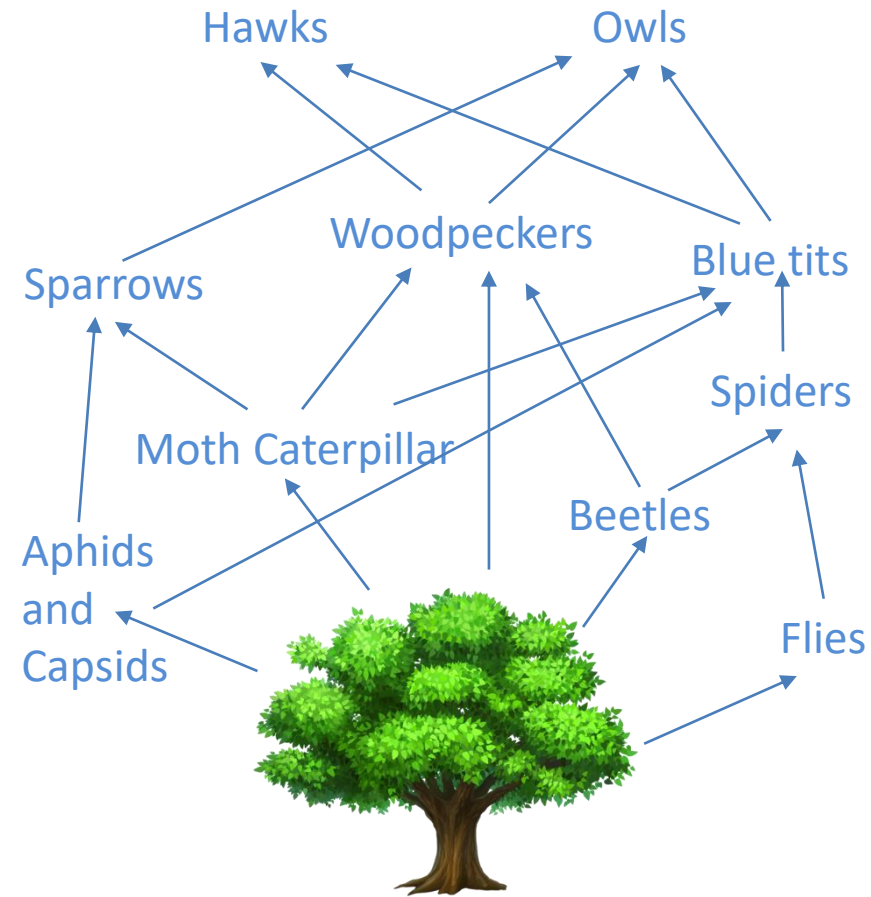
In some places, grass (rather than trees) may dominate in the future, if climate change predictions are correct.

# How does loss or gain of one species affect the web?

Oak woodlands support many species. Suppose that the population of beetles is reduced by disease, this would directly impact on the numbers of woodpeckers. With fewer beetles, comes fewer meals and their numbers may decline. However, we may see an increase in oak tree growth if fewer beetles were feeding on them.

The indirect result of a reduction in beetles.

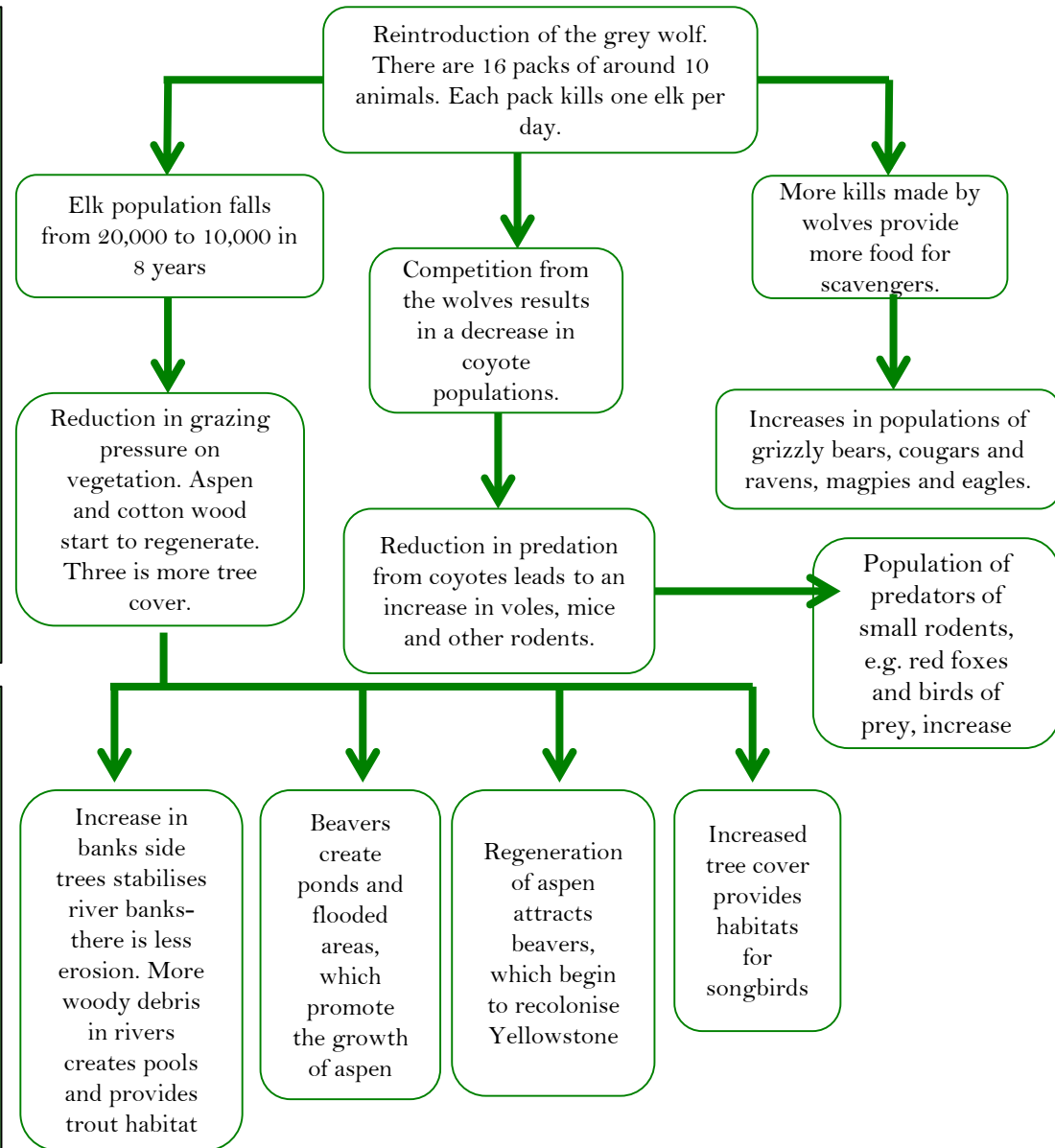
- Owl and hawk numbers may also fall because they feed on woodpeckers.
- Woodpeckers are carnivorous and have multiple food sources, they may just eat more caterpillars (but this would have problems for blue tit numbers).



# How can management restore the balance?

Many species have been hunted to extinction, without a full understanding of how this could affect the ecosystem balance. In Europe and the USA, killing wolves and bears removed danger to people and their cattle. But fewer carnivores caused the rabbit and deer populations to quickly grow and strip the land bare of vegetation leading to soil erosion.

Many scientists believe that 'ecosystem restoration' is the best way to restore ecosystem balance. Grey wolves were recently introduced into Yellowstone National Park which resulted in numerous impacts. The wolves have restored balance to the ecosystem and landscape.



# Exam question

Use the example of  
Yellowstone

Use because and  
this means that

Using a named example, explain how change can have short-term and long-term effects on an ecosystem. (6 marks)

Focus on three main changes. Make links between points

Focus on the main immediate changes and those longer lasting

**WASOLL**

Yellowstone National Park reintroduced wolves into the ecosystem because.....

This reintroduced effected the population of ..... because..... This meant that.....

Furthermore, the population of ..... was also effected because ..... This meant that.....

Levels1 (Basic) 1-2

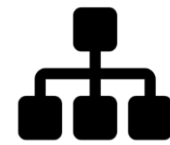
You demonstrate limited knowledge of the short and long term effects.

Level 2 (Clear) 3-4

You demonstrate specific and accurate knowledge of the short and long term effects.

Level 3 (Detailed) 5-6

You demonstrate specific and accurate knowledge of the short and long term effect.



Structure

Paragraph structure:

- A brief description of the Yellowstone ecosystem and why wolves were reintroduced
- An explanation of the short term effects of the reintroduction of wolves.
- An explanation of the long term effects of the reintroduction of wolves.
- Use specific facts and statistics about Yellowstone National Park.



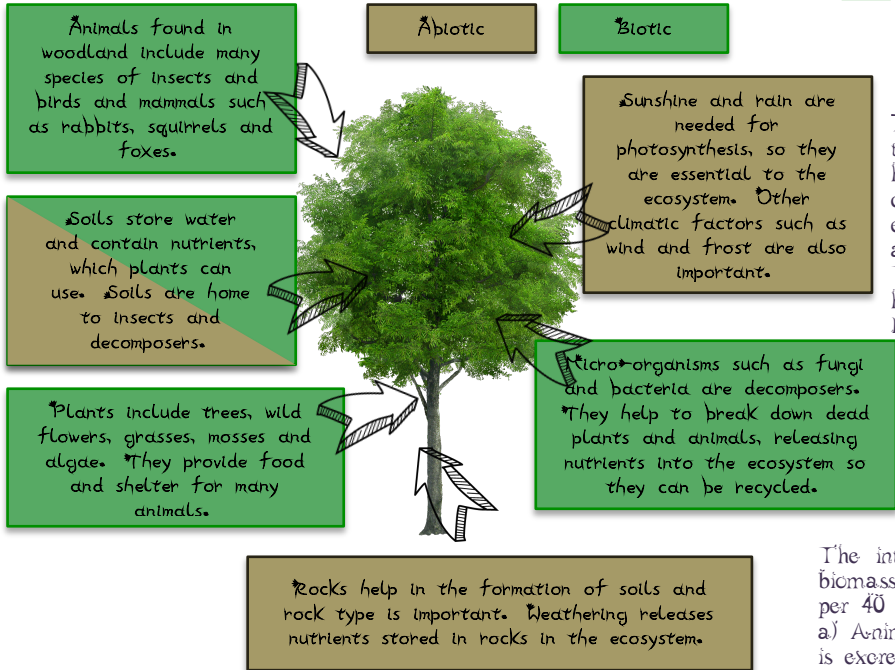
Literacy

Can you use these key terms:

- Population
- Elk
- Regeneration
- Competition
- Producers
- Consumers
- Recolonise
- Habitats

# What are the parts of an ecosystem?

# Ecosystems



## How do food chains work?

**Top carnivores:** these animals will hunt and eat other carnivores in the ecosystem as well as herbivores. They include hunters such as lions and wolves.



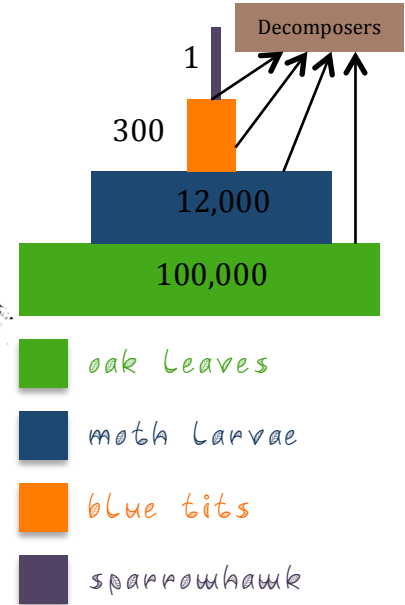
**Carnivores or secondary consumers:** these animals feed on herbivores such as foxes.



**Plants or primary producers:** green plants that use photosynthesis and take nutrients from the soil using their roots.



**Herbivores or primary consumers:** plant eating animals such as cows or rabbits.



The interrelationships between the feeding groups can be shown in a food chain. The food chain shows the weight of biomass getting smaller at each level. For example in a tropical rainforest there are only five kilograms of animal biomass per 40 kilograms of plant biomass. There are two reasons for this:

- Animals do not eat many parts of plants, and carnivores do not eat all of their prey. Also much of what animals eat is excreted.
- Energy is lost at each level: hunters use a lot of energy: chasing prey can be time-consuming and exhausting.
- Some herbivores search around a lot for plants to eat. Energy is also constantly being used up in respiration. Much of an animals daily calorie intake is used simply to stay alive, rather than to build new biomass.

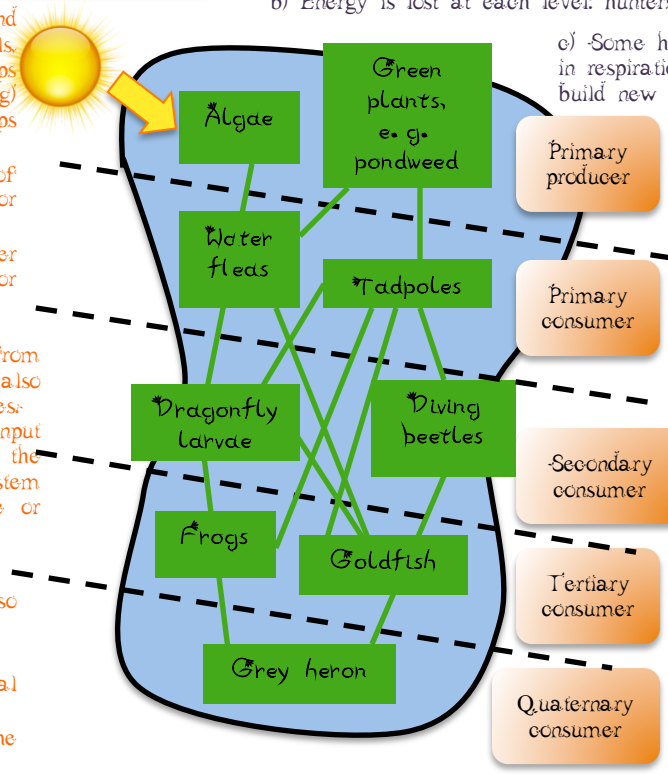
An ecosystem is made up of plants and animals and their surrounding physical environment, including soils, rainwater and sunlight. Important interrelationships link together the biotic (living) and abiotic (non-living) parts of the ecosystem. These interrelationships consist of:

- Physical linkages between different parts of the ecosystem (animals eating the plants for example).
- Chemical linkages (mild acids in rainwater speed up the decay of dead leaves for example).

In ecosystems, plants and animals can migrate from one place to another, bringing change. There are also inputs and outputs from the ecosystem to other places. Most importantly ecosystems depend on a constant input of sunlight from the Sun, as well as rain from the atmosphere. In turn rainwater leaves the ecosystem when it evaporates and returns to the atmosphere or runs into a river.

Ecosystems can be any size:

- Local (a small scale ecosystem is also called a habitat)
- Regional (Englands lake district moor land)
- Global biomes (south Americas tropical rainforest)
- Earth (some scientists argue that all of the plants ecosystems are linked together)



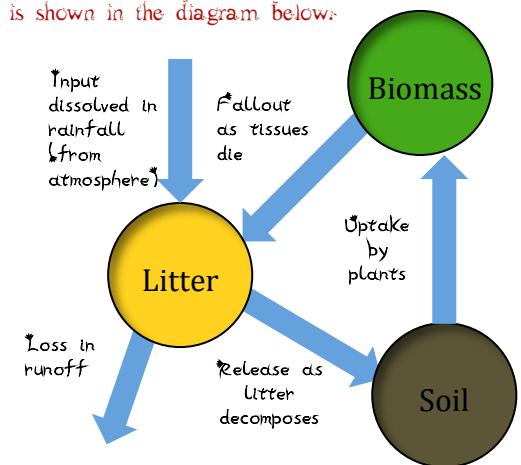
## Why are nutrient cycles important?

All plants and animals depend on nutrients in food for their health and vitality. Nutrients occur naturally in the environment and are constantly recycled in every ecosystem. The nutrient cycle is shown in the diagram below:

**Litter:** plant litter, A layer of dead plant material such as leaves, bark and twigs on top of the soil.

**Biomass:** This is the mass of living biological organisms.

**Soil:** Soils play an important role in holding nutrients.



○ nutrient stores  
 → nutrient transfers