

Classification

Plants	Animals	Fungi
Flowers, trees, grasses, mosses	Fish, Insects, Mammals	
<ul style="list-style-type: none"> <li>• Cell walls made of cellulose</li> <li>•</li> </ul>		

Protoctista	Prokaryotes

Arthropods

For each arthropod below state what group it belongs to and why.



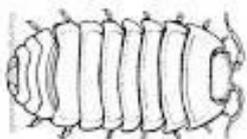
Animal: Ant  
Group:  
Characteristics:



Animal: Centipede  
Group:  
Characteristics:

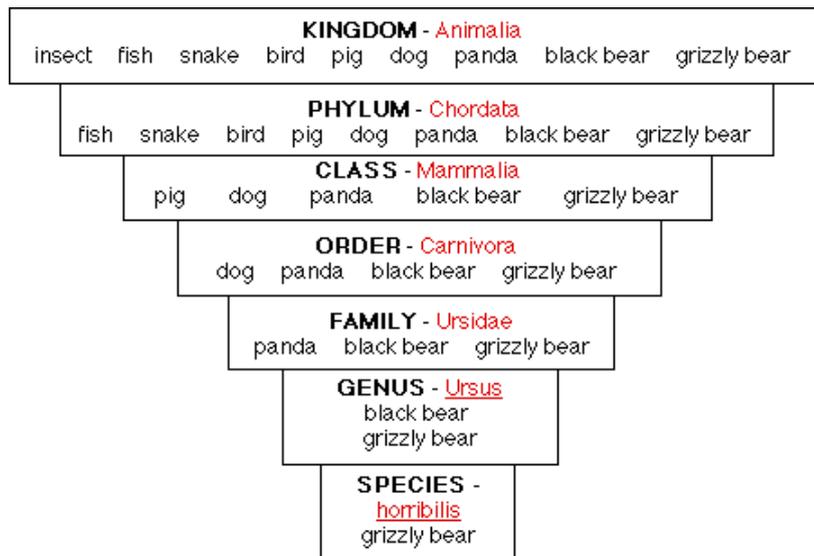


Animal: Scorpion  
Group:  
Characteristics:



Animal: Woodlouse  
Group:  
Characteristics:

## Dividing the Kingdoms



You need to be able to remember the order of the levels of classification.

A good mnemonic from class was;

Kate

Pushed

Chris

Over

Family's

Garden

Shed

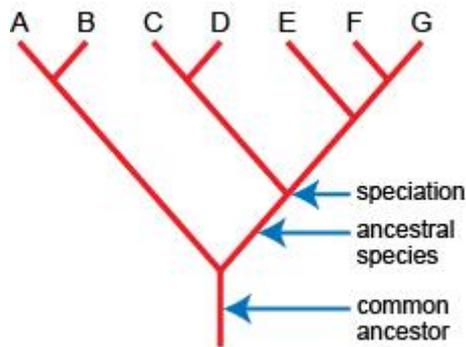
Use the internet to find the answers to the following questions.

- What order does a manatee belong to?
- What genus does a shoebill belong to?
- What family does HIV belong to?
- What kingdom does the shiitake mushroom belong to?
- How can you work out the binominal name of a species?

f) Why is binominal naming important?

Evolutionary trees

Evolutionary trees are used to represent the relationships between organisms. The diagram shows an evolutionary tree.



An evolutionary tree

In this evolutionary tree, species A and B share a common ancestor. Species F and G share a common ancestor, which itself shared a common ancestor with species E. All seven species share a common ancestor, probably from the distant past.

There are some exam questions to help with this if you would like to look at this more.

Classification Systems

Complete the table to show the differences between the 2 classification systems

Artificial	Natural

Write a definition for the word species

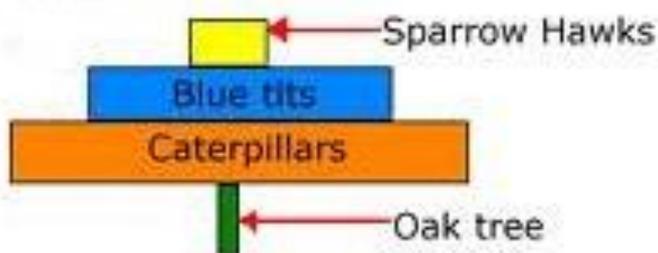
DNA is a relatively new finding. How do you think its discovery has changed classification systems?

Feeding Relationships

Below is a food chain:

Flower → Caterpillar → Blue Tit → Hawk

- a) Which organism is at trophic level 1?
- b) How many trophic levels are there in the food chain?
- c) Which animal is a herbivore?
- d) Which organism is a secondary consumer?
- e) Which animal is the top carnivore?



What type of pyramid is this?

Sketch the other type of pyramid showing the same information.

What problems are there with pyramids of biomass? (HINT: if stuck see p.59)

Give 3 ways in which energy is transferred out of the food chain

- 1.
- 2.
- 3.

Sometimes two of these can be used to start new food chains.

Which 2?

How does a pyramid of biomass explain energy efficiency in a food chain?

Why do you think food chains are usually no more than 4 trophic levels long?

You can calculate the efficiency of an energy transfer using the following formula:

$$\text{Efficiency} = \frac{\text{energy in organism}}{\text{energy available}} \times 100\%$$

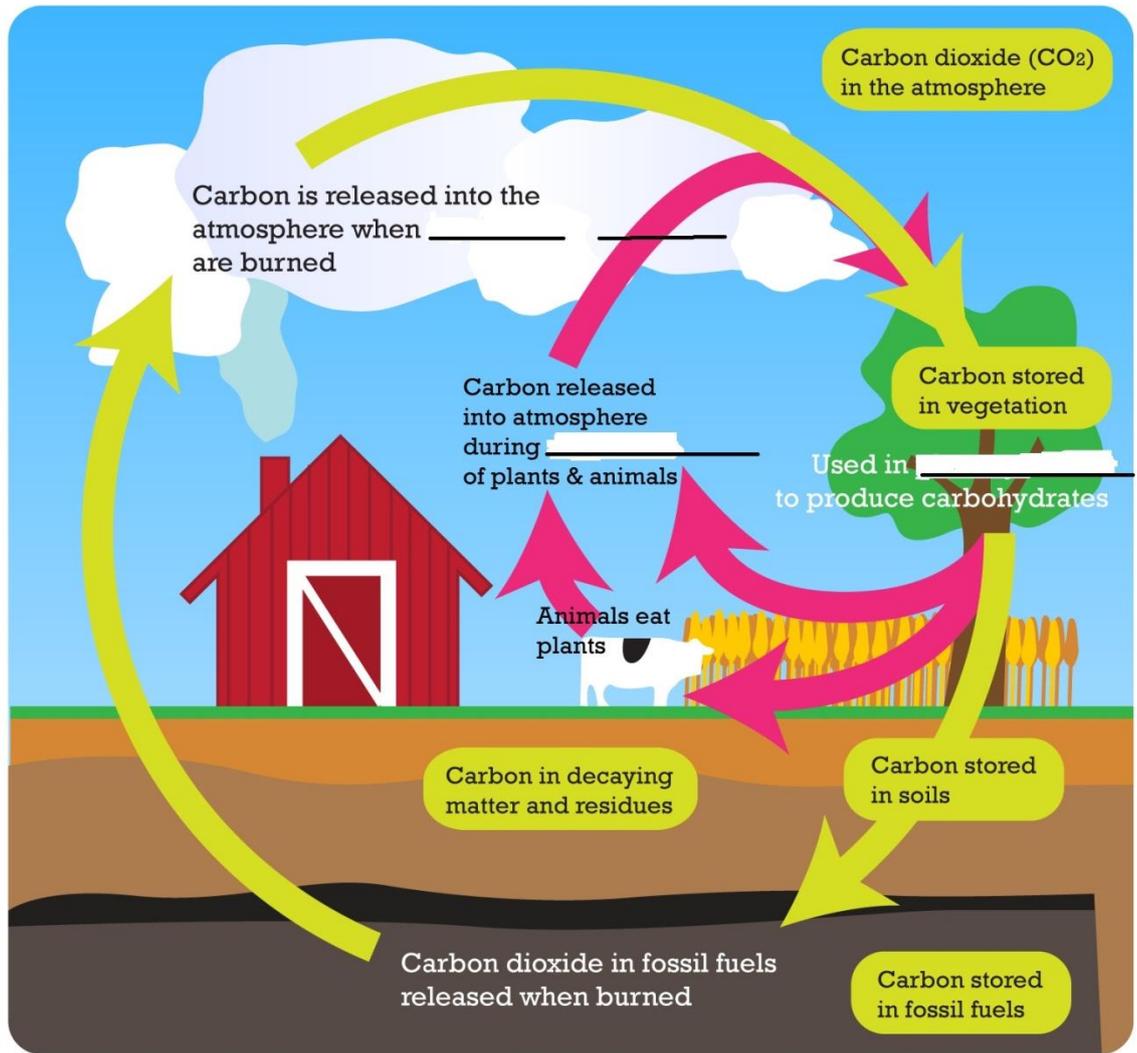
A cow has eaten 250kJ of stored energy. She excretes 150kJ and stores 25kJ.

- a) How much energy has the cow used for respiration?
  
- b) The 25kJ stored is available to the next level of the food chain. Use the formula to calculate the efficiency.

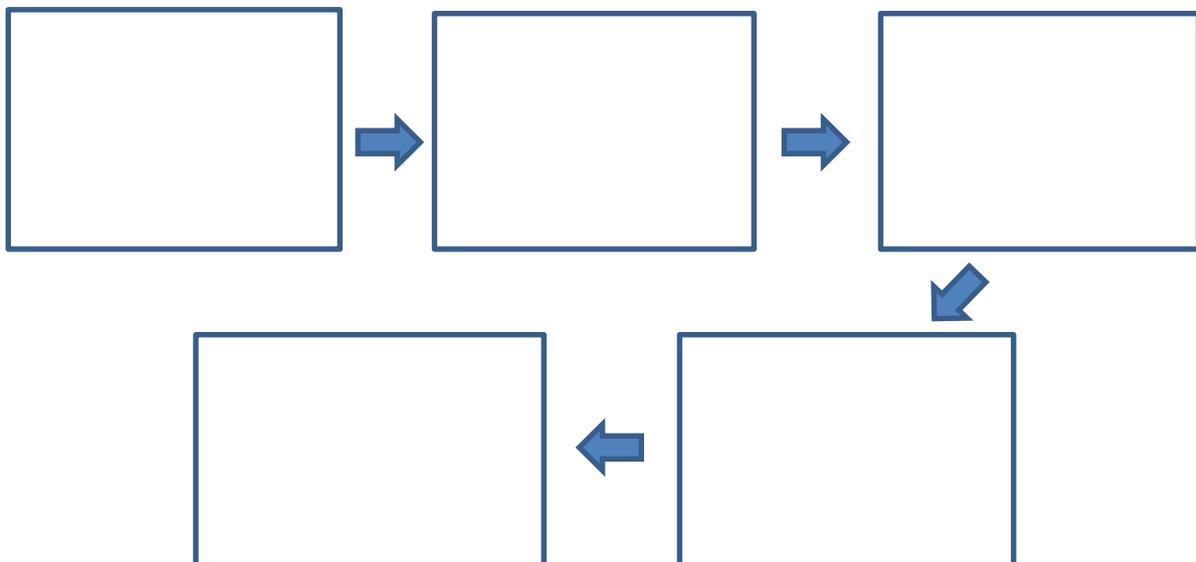
A chicken has eaten 100kJ of stored energy. They excrete 55kJ and 43kJ is released through respiration.

- a) How much energy is stored?
  
- b) Calculate the efficiency.

Carbon Cycle



1. Fill in the 3 missing words.
2. Use page 63 in the text book. For the information in pink draw/write a flow diagram showing how carbon can be locked up.



## Nitrogen Cycle

### Higher Information

- Soil bacteria and fungi act as decomposers and convert proteins and urea into ammonia
- Nitrifying bacteria convert this ammonia to nitrates
- Dentrifying bacteria convert nitrates back to nitrogen gas
- Nitrogen fixing bacteria are in the roots of plants and this bacteria combines nitrogen with oxygen to make nitrate which the plant will then use. Lightning can also provide enough energy to make this happen.

How many different types of bacteria are mentioned above? List them.

How is ammonia made?

How does lightning make nitrates?

What is the % of nitrogen in the air?

Why is nitrogen so important to living things?

What is a legume?

### Competition

A habitat can support different species because each species has its own niche. For example, a squirrel and a sparrow can both live in an oak tree but the 2 do not compete with each other for food as they eat different things.

Giraffes and zebras are both herbivores. Describe how each animal can live on the savannah. What are their niches?

Define the following words

Interspecific

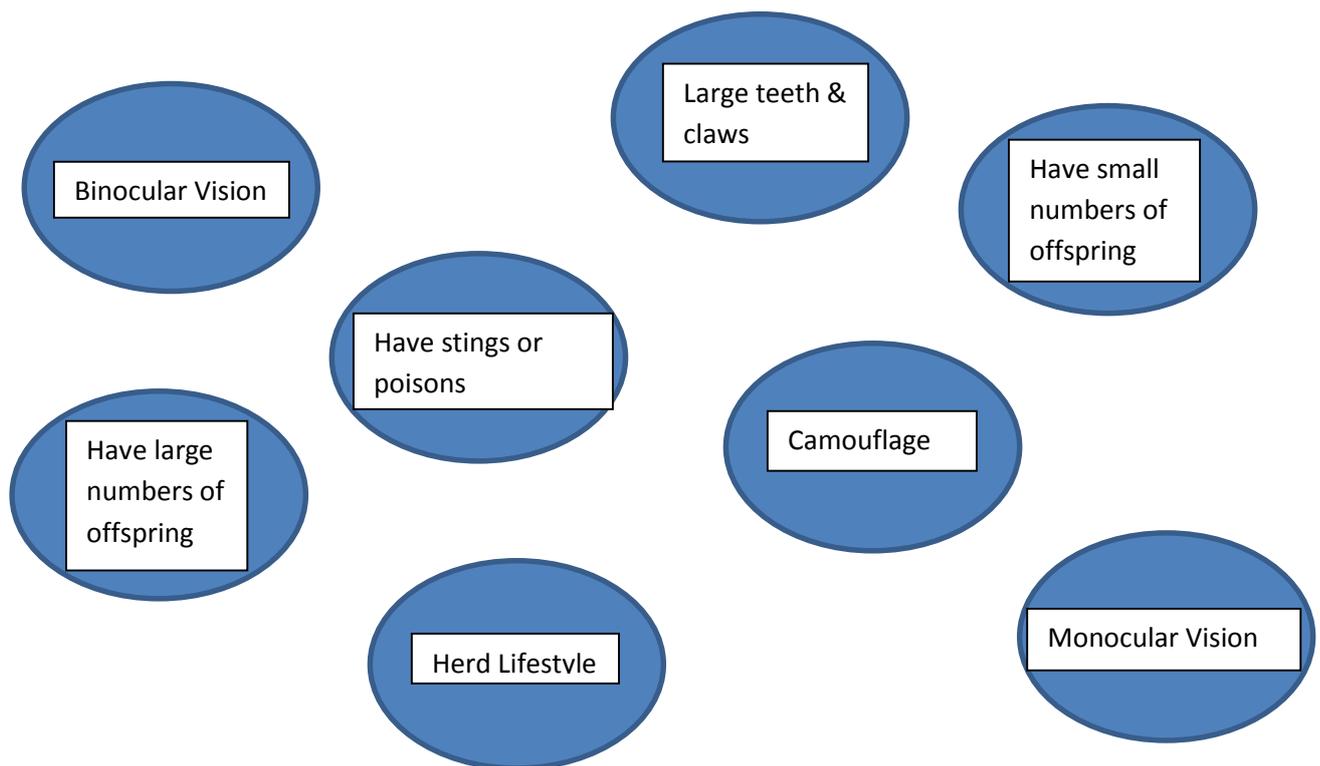
Intraspecific

Is competition between the zebra and giraffe inter/intraspecific?

2 packs of wolves are competing for territory, what type of competition is that?

Predator & Prey

Next to the following statements write whether they are more common to predator or prey species, or whether they are found in both.



Research examples of the following types of relationships

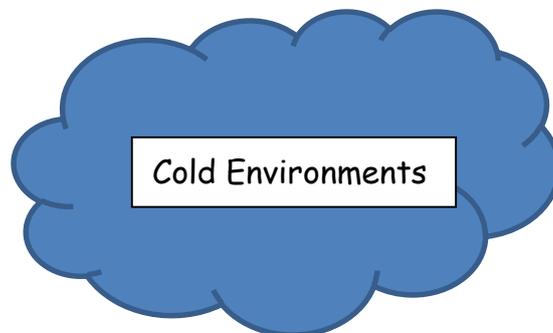
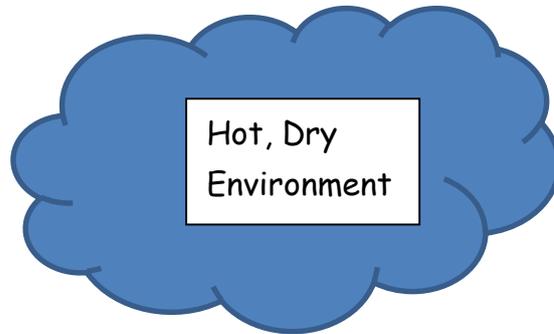
1. Mutualism
2. Parasitism

The legumes from the nitrogen cycle are an example of one of the above types of relationships.

Which one and why?

Adaptations of Animals

Complete 2 mind maps showing similar adaptations for animals living in 2 different climates.



Animals that can survive in extreme temperatures are called extremophiles.

Some bacteria can survive temperatures over 80°C. Their enzymes are specially adapted to work at these temperatures.

1. Why wouldn't a human survive at those temperatures?
2. Use page 71 in the text book to help you explain how penguins are adapted to walk on ice.
3. What is the difference between a generalist species and a specialist species?
4. Find an example of each type of species (generalist/specialist). Do not use the examples given in the text book.

Plant Adaptations



Give 4 adaptations of the cactus that allows it to survive in hot, dry conditions. Explain how these adaptations are beneficial.

- 1.
- 2.
- 3.
- 4.

Design a plant that is found in a habitat where water is scarce, there is only sunlight for a few hours a day and it is eaten by animals. Make sure you annotate your diagram to say how it is adapted to survive.

Behaviour

Explain what each of these terms mean and research an animal that exhibits this behaviour

1. HIBERNATION
2. MIGRATION
3. SUN BASKING
4. WATER STORGEAE

Ask me for an example question on surface area to volume ratio.

Evolution & Natural Selection



Pug



Border Collie



German Shepherd

Above are 3 different breeds of dog. Give 3 differences between them.

When there is differences within a species what is this called?

Why is this needed within a species? Discuss the idea in relation to natural selection.

How are traits passed on from a parent to its offspring?

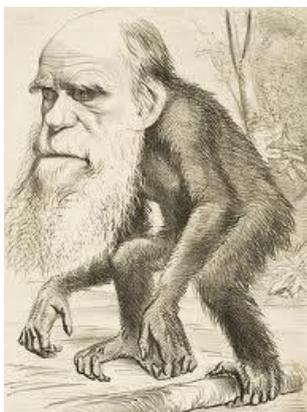
Who is credited with the theory of evolution?

How was Lamarck's theory different?

Why is the theory of evolution accepted now?

What proof is there?

The theory of evolution was presented in the 1850's. Why did people not accept the theory?



What is the definition of evolution?

What 3 examples of evolution does the text book give? (p77)

1.

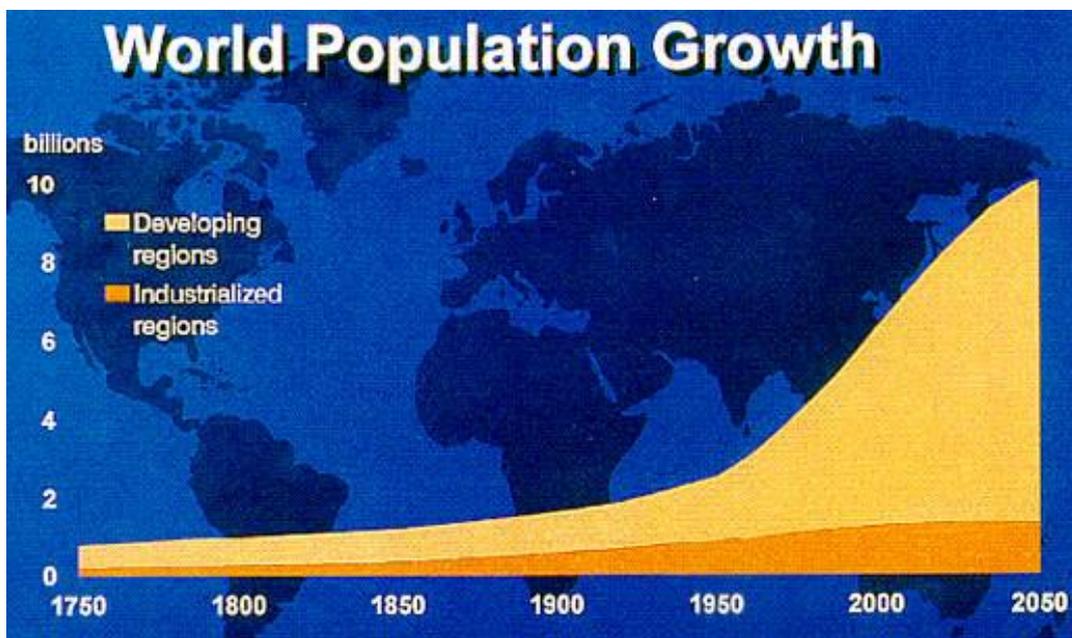
2.

3.

### Pollution

What are the 3 fossil fuels?

What are some problems with fossil fuels?



What is the predicted global population for 2050?

How will this affect pollution?

Complete the table below

Issue	Gases Causing Issue	How gases are released	Effects
Global Warming			
Ozone Depletion			
Acid Rain			

Log onto Wikipedia, search for 'List of Countries by Population'

Put the top 10 countries and their populations into the table below

No.	Country	Population	CO <sub>2</sub> Emissions
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Now use Wikipedia and search for 'List of countries by carbon dioxide emissions'

Put this information into your table.

Can you see any trends in the data?

Is it the countries with the largest populations emitting the most amount of carbon dioxide?

Indicator species can be used to inform us how polluted an area is.

Lichens are a common indicator species.

Explain how lichens can be used to indicate how polluted an area is.

Are there any issues with using living things as pollution indicators?

Water pollution can be hazardous as it can disrupt food chains and cause disease.

Give 2 ways in which water could be polluted (p79)

Rat tailed maggots are found in very polluted water and are an indicator species.

How is the rat tailed maggot adapted to live in such polluted conditions?



### Sustainability

The Black Rhino is an animal which has been classified as critically endangered. What does this mean?

There are 7 levels of classification to indicate organism populations.

The IUCN Red List is a document which is constantly updated by scientists and is used all over the world. It states at what level each species is currently at.

Least Concern						Extinct
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Use the IUCN Red List (type into google) to complete the above diagram to show the 7 levels.

Complete the following passage

It is important to c\_\_\_\_\_ organisms because the human population is g\_\_\_\_\_ so food r\_\_\_\_\_ need to be preserved. Also, many plants are used for m\_\_\_\_\_ purposes and scientists need to be able to s\_\_\_\_\_ all species to identify which can be of use.

Organisms are all i\_\_\_\_\_ and are part of a global food w\_\_\_\_. If certain key specie populations are drastically changed it could have a detrimental effect on other species populations, including our own.

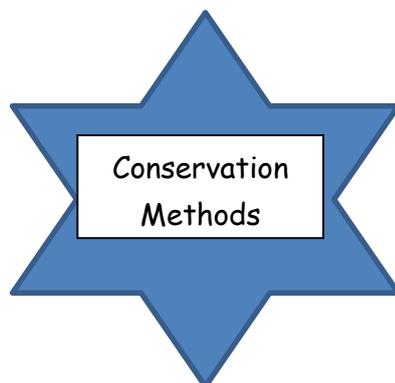
There are also e\_\_\_\_\_ reasons. Human beings have destroyed many h\_\_\_\_\_ and caused massive declines in certain species populations as well as the e\_\_\_\_\_ of others. Do we not have a responsibility to share this planet and conserve as many organisms as we can?

Conserve	Web	Resources	Habitats	Extinction
Interlinked	Medical	Ethical	Study	Growing

Complete the mind map below by adding more detail to each of the headings showing how conservation can be beneficial

Education

Laws



Breeding Programmes

Protecting Habitats

Why are large population sizes important for survival of species?

(HINT: Think about the natural selection, what is the first step? What must a population have in order to adapt and evolve?)

Whales are hunted for meat and oil. Their numbers have been declining over the years until whaling was banned.

Some countries resisted the whaling ban, why do you think that was?

What issues are there with policing whaling?

Some scientists are granted permits to hunt whales for research purposes. Why do you think this is allowed?

This is Shamu. He is a popular mascot for some theme parks in America. The Seaworld parks pride themselves on their conservation methods. In what ways is Shamu helping conservation?



Sustainable development is ensuring that human beings can take what they need from the environment without harming it and ensuring that there will be enough resources available for the foreseeable future.

Velvet Toilet Roll Company state that for every tree they cut down to make their product they replant 3 more. This is an example of sustainable development.

1. Fish stocks in waterways are reducing rapidly. How could we ensure fish levels are sustainable?

2. How could sustainable development benefit endangered species?

To create sustainable resources requires a lot of co-operation between local, national and international agencies. A lot of people have to work together but it is beneficial. We need to ensure that future generations have enough food to eat and energy resources.