

Introducing ecosystems!

- 1 Imagine you are standing in a garden. On a piece of rough paper, write down the things that would be around you, eg grass, cat, air.
- 2 Write these neatly on a sheet of plain paper – spread them out with room between each word. It is probably best not to have more than 12 words. Choose the most important ones, eg water, sun, air, soil, plants.

water

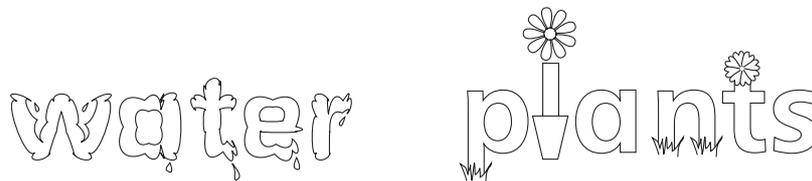
soil

sun

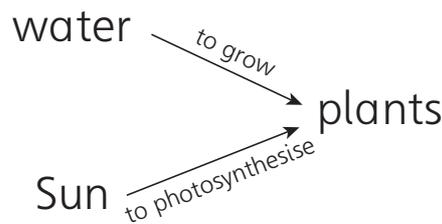
air

plants

- 3 You may wish to decorate the words or add pictures, but leave spaces between them. For example:



- 4 Now choose a pair of things from your sheet which you think might be linked in some way, for example, people need air. Draw an arrow between them and write on why one needs the other. For example:



- 5 Now add arrows for all the other links you can think of.
- 6 You have just drawn a diagram of an ecosystem! An **ecosystem** is a community of living things and their non-living environment. Many parts of an ecosystem are linked together in some way. Write the title 'Garden Ecosystem' on your sheet. There are many other ecosystems, such as a rainforest, a pond or a field.
- 7 Now decide which of the parts of the ecosystem on your sheet are living and which are non-living. Living things are **biotic** (eg plant) and non-living things are **abiotic** (eg soil). Underline biotic things in one colour and abiotic in another. Add a key.
- 8 Your ecosystem diagram is finished! Make sure it is presented well.

Ecosystems key words!

Work on ecosystems involves a lot of words which may be new to you. See how many you recognise from the list below. On a separate piece of paper, match up the words with their meanings and then answer the questions below:

Words	Meanings
Biome	• an animal which eats plants
Nutrients	• the amount of living things in an area (usually measured in grams per m ²)
Biomass	• a community of living things and their non-living environment – many parts are linked together
Consumer	• a large-scale ecosystem, eg rainforest
Ecosystem	• green plants which make energy through photosynthesis
Biosphere	• the food that plants need, eg magnesium
Herbivore	• an animal which eats meat
Decomposer	• all the areas of the world where living things can survive, eg sea, ground
Carnivore	• something which eats other things
Producer	• bacteria and other organisms which break down dead plants and animals

(10)

Questions

- 1 Would you expect the biomass to be higher in a rainforest or a desert? Explain your answer. (2)
- 2 Write down three of the words which refer to things you might find in a garden. If possible, give an example for each one. (3)
- 3 Which two of the words refer to things which are much bigger than a garden? (2)
- 4 Could any of the words apply to you? Explain your answer. (1)
- 5 Give two examples of ecosystems in your local area. (2)



Urban footprint

Sustainable refers to something which people are using in a way that meets present needs but will also allow people in the future to meet their needs. For example, if a country chops down all its rainforests, this is not sustainable because it does not protect the ecosystem for future generations who might have lived in the forest or discovered important medicines from the plants there.

It is easy to focus on big environmental issues when thinking about sustainability, but what about our lifestyle in the UK? Most of us use large quantities of resources compared to people in less economically developed countries.

Fill in the table below to consider your own resource use:

How many of each resource does your family use	In a week? (estimate)	In a year? (x 52)
Sheets of paper (exercise book, A4, etc)		
Loaves of bread		
Plastic wrappers on food or plastic bags		
Litres of petrol		
Litres of water (a sink = 5L, shower = 7L per min)		

Many of the items we buy are designed to be thrown away quite quickly after they have been bought.

List some things you have thrown away today:

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Most people living in Britain will have a similar lifestyle to you – that means a lot of resources are being used and disposed of all the time. As 89% of us live in urban areas, much of the resource use is concentrated in a fairly small proportion of Britain’s land area – the biggest urban area is London.



The following figures show some of the resource use and waste from London each year:

Selected inputs (resources used in tonnes)	Selected outputs (waste in tonnes)
Fuel: 20 million tonnes of oil equivalent	Industrial and demolition waste: 11.4 million
Oxygen: 40 million	Household and commercial waste: 3.9 million
Food: 2.4 million	Sewage sludge (after processing): 7.5 million
Plastics: 2.1 million	Carbon dioxide: 60 million
Total resources used: 1 billion tonnes	Total solid waste produced: 23 million tonnes

(Source: OneWorld Online at <http://oneworld.org/guides/thecity/superorganisms/footprint.html>)

It is estimated that the total land area needed to provide resources and dispose of waste for London is 19.7 million hectares – only slightly less than the total land area of Britain!

- 1 Why does London use such a large amount of resources?
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- 2 Why is the figure for waste produced less than the figure for resources used?
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- 3 The area of land needed to sustain a city is sometimes called its 'footprint'. Can you explain why?
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- 4 Although London's 'footprint' is almost the size of Britain, not all the resources actually come from Britain. Give examples of two other areas of the world that might be part of the footprint.
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- 5 What environmental problems might be caused by London's use of resources? Are there any benefits from it?
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- 6 Do you think the resource use in London is sustainable? Justify your answer.
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