

## Studying animals

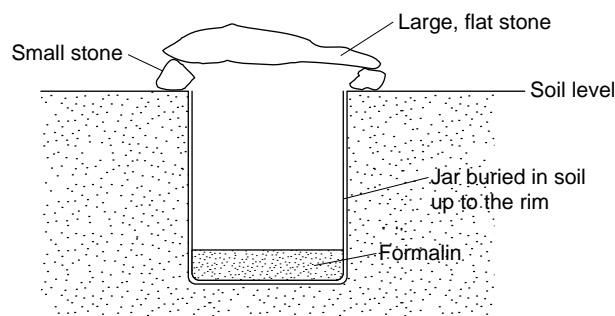
It is easy to study the plants in an area, but it is not so easy to study the animals.

### Looking for signs

Firstly we need to study the plants and the ground for signs of animals. This may be the only way to detect larger animals. Hoof or paw prints are a useful sign. Tracks or runs through vegetation could belong to any small animal unless there are other signs such as droppings.

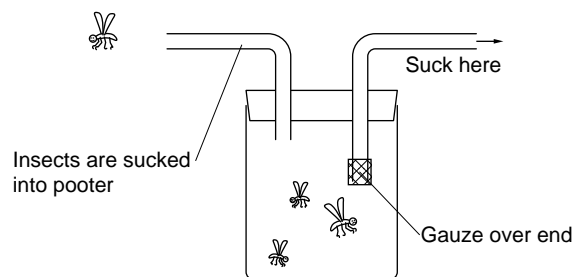
### Looking for invertebrates above the ground

Animals that live on, or just below the surface can be caught in a pitfall trap.



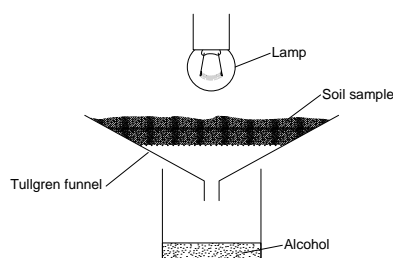
Leave the trap set up overnight and then recover it the next day. Examine the specimens you have caught and try to identify them.

Insects in the field layer can be caught using a large sweep net. The animals caught can be sucked up into a pooter to contain them until they have been identified.



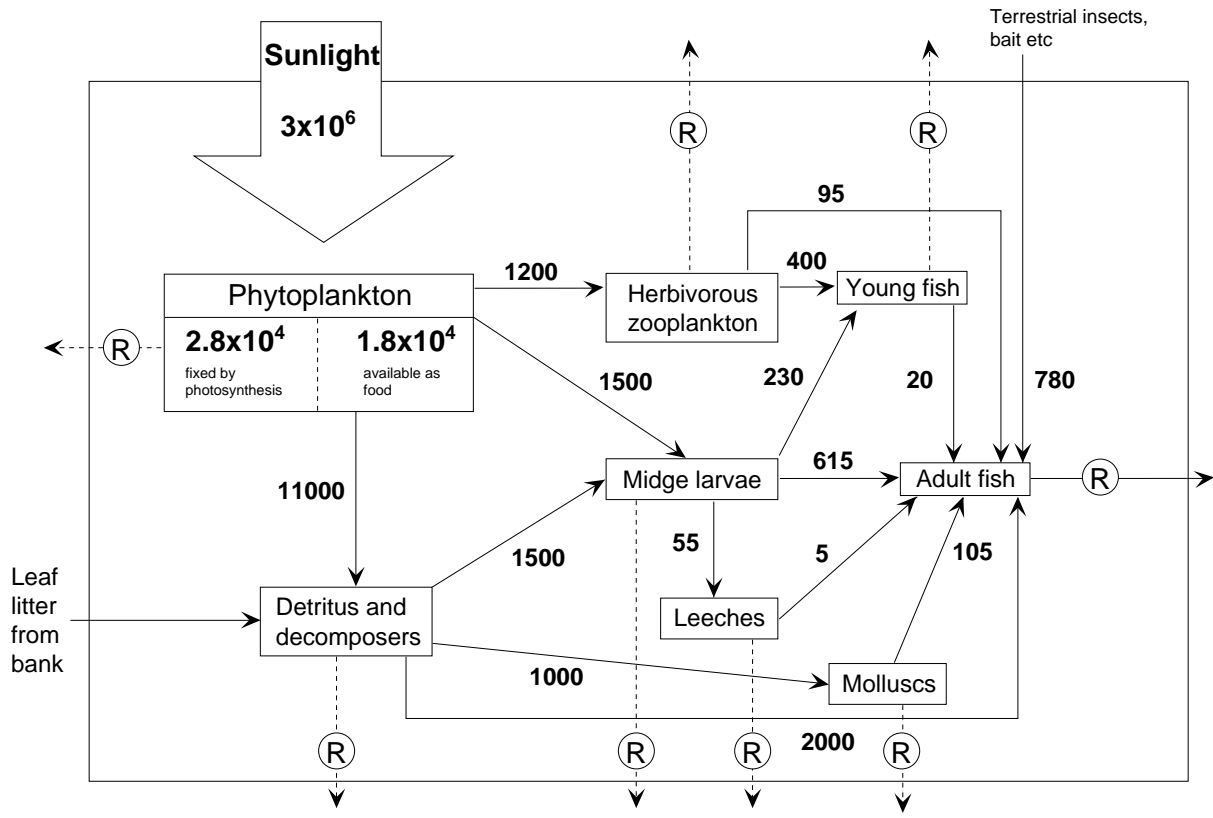
Tree-living insects can be collected by tree beating. A plain sheet is placed below the branch to be studied, or an umbrella hung below the branch. The branch is then shaken or hit carefully with a stick. A proportion of the insects will fall onto the collecting sheet.

Animals in the soil can be collected using a Tullgren Funnel. This method alters the conditions the animals are subjected to so they move away from the light.



### Energy interconversions

Below is a simplified version of some of the energy chains operating in a freshwater ecosystem. Study the diagram carefully and use the information to answer the questions.



Key: Units: kilojoules/sq.metre/year ( $\text{kJm}^{-2}\text{y}^{-1}$ ) (R) = Energy lost through respiration



#### Questions

- 1 The amount of energy fixed by photosynthesis is considerably less than that made available by sunlight. Suggest how the 'missing' energy is 'lost'.  
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- 2 Calculate the energy loss owing to respiration for each organism in the diagram. Use these figures to calculate the total loss through respiration from the ecosystem. Display your results on a separate sheet of paper (eg for the zooplankton: energy lost by respiration =  $1200 - 95 - 400 = 705 \text{ kJm}^{-2}\text{y}^{-1}$ ).  
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- 3 What proportion of the total energy available to the ecosystem is eventually lost through respiration?  
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- 4 The actual value of the energy loss due to the respiration of the adult fish is  $3500 \text{ kJm}^{-2}\text{y}^{-1}$ . This is less than the figure that you will have calculated in question 2. Can you explain this discrepancy, assuming that there are no experimental errors?  
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## Quarrying and open cast mining

In Britain and many other countries, natural resources are extracted from the ground by quarrying and mining. Deep pit mining has little impact on the environment but both quarries and open cast mines can have major effects on the surrounding areas.

In Derbyshire there are a number of large quarries which are gradually removing the tops off the hills. Open cast mines make large holes in the ground. In some parts of the world the holes are so large that railways and roads run at several different levels within them.

As well as the huge scar on the landscape, these activities can have effects on wildlife and humans living in their vicinity.



### Questions

1 What adverse effects would you experience if a company started a quarry near your home?

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2 What is likely to happen to the plants and animals living in the area?

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3 How might quarrying affect the tourist industry in an area like Derbyshire or North Wales?

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When quarries and open cast mines are worked out, they are often used as landfill sites. In these the hole is filled with layers of domestic waste and soil.

**Diagram of a newly filled landfill site in an old clay pit**

