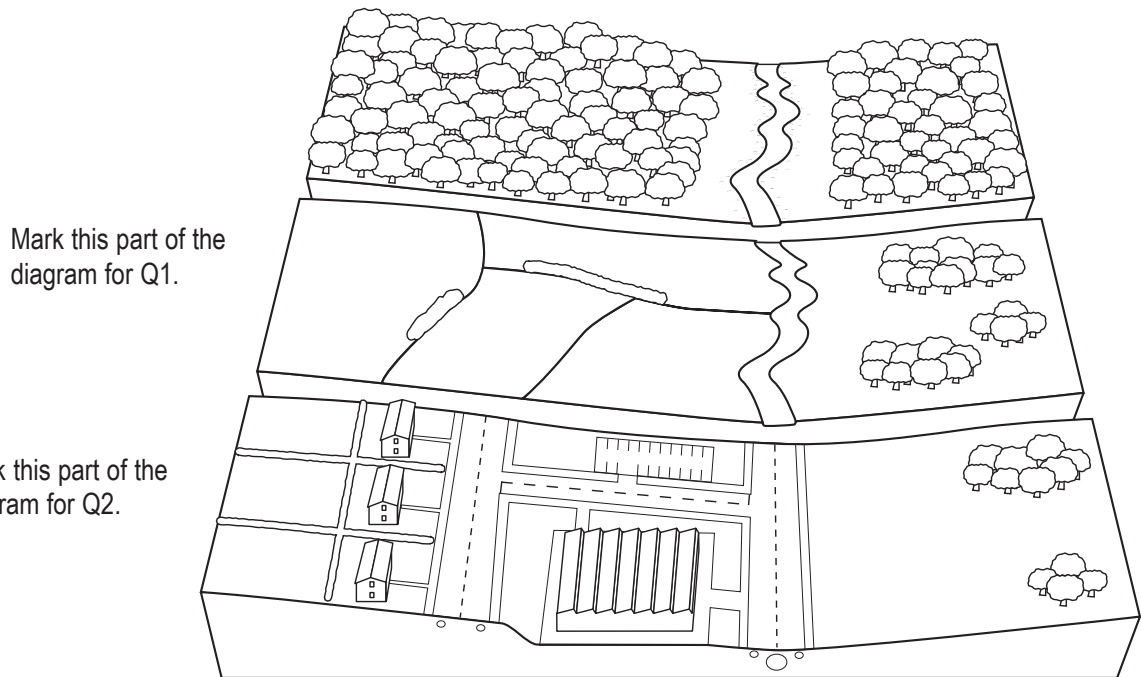


How people cause floods

People change the landscape quite dramatically. Usually they don't realise they are adding to the risk of floods, because each person makes just a small change. But the results can be very severe.



Q1. Describe how a farmer can make changes that increase flooding. Mark these changes on the diagram above.

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Q2. Describe how the growth of a city can cause flooding. Again, mark the changes you discuss on the diagram above.

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Answers

This worksheet invites quite long answers and benefits from discussion. It can also involve school-based field work.

The key points to address in thinking about how people cause flooding is to help students to realise that many small, apparently unconnected events cause a big change. It is worth looking out of a classroom window, or taking a short trip around the school building, just to give a realistic idea of how far the changes have gone. For example, many areas were once forested, so get students to imagine what the school site was once like (a forest) and then look at it today.

Q1. For farmland, changes of land use from forest to pasture reduce the amount of seepage, but as grass transpires less than trees, the soil does not dry out to as great a depth, and so less water is needed before it is saturated. Farmers also tend to plough fields up and down slopes, creating natural drains across field. They also install subsurface drains. Furthermore, the constant movement of machinery on a farm tends to compact the subsoil, making it harder for water to seep down to rocks.

Q2. For built-up areas there will not only have been a change to the vegetation (for example, trees replaced by playing fields, etc.) but also a change in the way that the water moves. Thus playing fields are usually drained so that they are usable for longer. This means water flows away from the fields to storm drains and rapidly reaches rivers, where it would have seeped slowly and naturally through rocks.

The same process is even faster for roofs and roads. Rainwater passes rapidly into drains shaped to carry water as efficiently as possible.

Resources

- ▶ Possible walk around the school perimeter or drive around the neighbourhood to see how much of the ground has been altered.

Background support

The impact of people on their environment is of concern to everyone and a good topic for class discussion and project work.

In fact, people have innumerable effects on the natural flow of a river basin and the chances of flooding. It is best to think of these effects in terms of

- (i) changing land use;
- (ii) reduced permeability of land;
- (iii) physical changes to the river bed and banks, such as concreting a river channel or making it narrower and straighter.

Across the curriculum

Using this material you can link:

- ▶ Physical processes, such as the way that water moves through soils, the storage capacity of a soil, the maximum infiltration rate of a soil;
- ▶ The hydraulic properties of a pipe and an artificial channel, compared to a meandering stream with a rough bed through the use of sand tray models and the use of pieces of guttering;
- ▶ The way that change happens gradually, so that people are not aware of the impact they might have;
- ▶ The way that small changes taking place over a large area can result in cumulatively large changes. This is important in the context of local and regional planning;
- ▶ The way that some communities now have flood relief and flood abatement schemes, including various forms of soakaways or retention ponds for floodwaters;
- ▶ The way that flood risk might be different in places experiencing sudden torrential thunderstorms, such as Los Angeles, and those experiencing long periods of winter rainfall, such as London.