

Land, water and bees – don't take us for granted:

Ecological footprint

Teacher notes

Introduction

These activities are designed to introduce the concept of ecological footprints and start students asking questions about the effect of their activities, particularly their dietary choices, on the environment. The companion activities about 'A healthy diet' do the same for the effect of dietary choices on health.

Assumed prior learning

Knowledge of what constitutes a balanced diet.

Activities

Aim

Investigate the ecological footprint of a nutritious, balanced diet.

'Ecological footprint' presentation

The presentation, available on The Crunch website (thecrunch.wellcome.ac.uk/schools), reviews the need to conserve resources and introduces the concept of the ecological footprint as a measure of resources used.

The questions in slides 12 and 13 are intended to help students consolidate what they have learned about the factors contributing to the ecological footprint of our diet. Students will need to consider energy use in growing and distributing foods. Air transport is the most expensive way of distributing foods. Growing foods out of season is likely to require light and heat and so is high in energy demand. Foods may need refrigeration during transport to remain fresh. Chemicals may be used to produce ripening as well as in growing the crop.

Because the actual answer to any question like this will depend on many such factors, these questions serve to highlight the things we should be considering when we buy our food, rather than the existence of single correct answers. For example, tomatoes grown in Spain and trucked (not flown) into the UK in spring can use less fuel overall than tomatoes grown in a heated greenhouse in the UK sold at the same time.

Water footprint

A short online video (6 minutes), 'How much water do you eat?', provides some startling facts about water and food – for example, 92% of the water we use is used in producing our food.

www.youtube.com/watch?v=EkhXeTnNqkM&feature=youtu.be

You can provide greater detail about clean water shortages and water pollution with the presentation 'Water in our world' from The Crunch website (thecrunch.wellcome.ac.uk/schools). Another useful resource is this interactive map from the BBC. Click on different regions to learn about regional water problems, or on the link at the bottom of the map to bring up a report by the BBC.

[news.bbc.co.uk/hi/english/static/in_depth/world/2000/world_water_crisis/default.stm](https://www.news.bbc.co.uk/hi/english/static/in_depth/world/2000/world_water_crisis/default.stm)

Carbon footprint

Your 'carbon footprint' indicates the amount of carbon dioxide released into the atmosphere by your activities. Four online calculators for ecological, and in particular, carbon footprints are listed on the Student activity sheet for students to try out. A set of questions uses their results to prompt more thought about how they can reduce their own footprint. Students are asked to plan a balanced menu and then estimate its carbon footprint using one of these calculators, so there is an opportunity for group or whole-class work comparing the size of the footprints for each student and suggesting improvements.

Answers to questions

'Ecological footprint' presentation

Slide 12: As explained in the notes above, answers depend heavily on details. The likely answer (depending on the factors listed in the notes section of the slide) is garden, June < British, March < Spanish, January.

Slide 13: Again, there are no definite answers. Look for a comparison of how foods have been produced and transported, and the position of the foodstuff in the food chain. Red meat has the largest ecological footprint, followed by milk and other dairy products, then chicken, and then fruit and vegetables. Packaging, cooking methods and transportation increase the footprint further.

Carbon footprint

1. Look for a suggested change that is simple and effective in reducing ecological footprint – for example, cycling to school instead of getting a lift (cuts carbon footprint), giving up meat for one day a week (reduces land, water and carbon footprints), no longer buying imported, irrigated green beans (shrinks water and carbon footprints).
2. The day's menu should include all the food groups in approximately the correct proportions.
3. Again, the change should be simple and should reduce the ecological footprint by, for example, taking the food down one trophic level (chickpea curry instead of lamb curry), substituting local, seasonal fruit for imported, irrigated fruit, or using loose vegetables bought at the farmers' market and brought home on a bicycle instead of pre-cut, packaged, frozen vegetables fetched from a supermarket by car.

Further reading

Water footprint information: waterfootprint.org/en/water-footprint/

How much water do you eat? (video):

www.youtube.com/watch?v=EkhXeTnNqkM&feature=youtu.be

Water Aid charity: www.wateraid.org/uk/audience/media/facts-and-figures

Waterwise water efficiency group: www.waterwise.org.uk

The *Big Picture* resources on eating meat:

bigpictureeducation.com/eating-animals-meaty-problem

bigpictureeducation.com/meaty-issues

game:

bigpictureeducation.com/sites/default/files/Feast%20or%20famine%20playing%20cards.pdf

video: bigpictureeducation.com/video-bugs-or-burgers