

Digimap for Schools

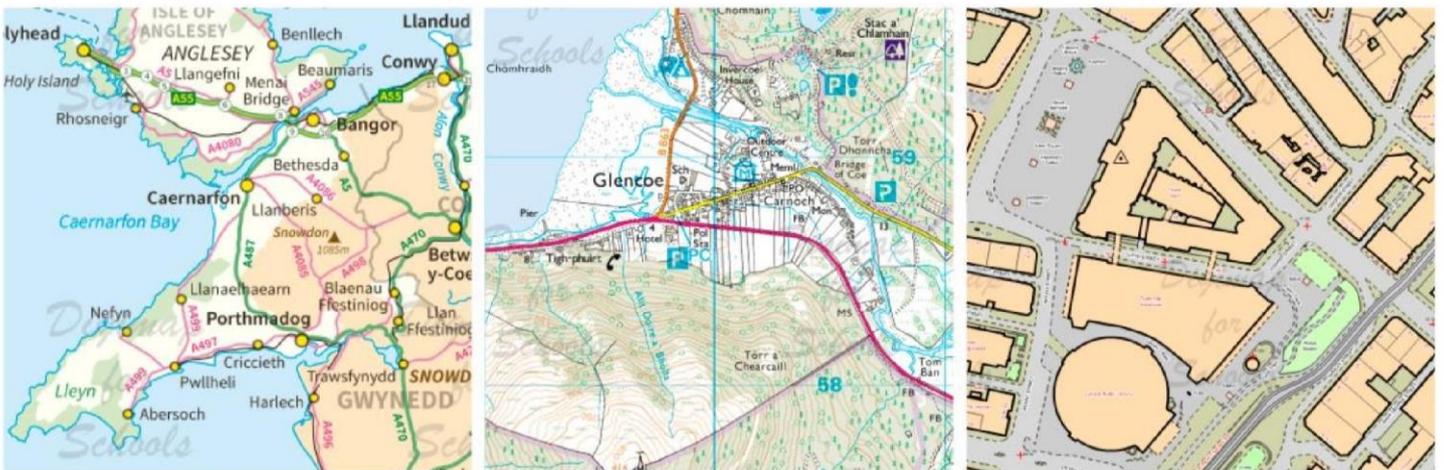
It's a Rubbish Footprint

Investigating how much rubbish we send to landfill

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Geography teaching resource

Primary



This is one of a series of teaching resources for use with Digimap for Schools. For more details about this service, visit <http://digimapforschools.edina.ac.uk>

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Digimap for Schools Geography Resources

Title: It's a Rubbish Footprint

Level	Context	Location
Primary	Investigating how much rubbish we send to landfill	Great Britain

Knowledge/skills	Drawing areas/measuring areas
Curriculum links (England)	Describe and understand key aspects of human geography, including land use; use maps, atlases, globes and digital/computer mapping to describe features studied
Curriculum links (Wales)	Describe the causes and consequences of how places and environments change; use maps, imagery and ICT to find and present locational information
Scottish Curriculum for Excellence	Social Studies Outcomes: People, Place and Environment: 2-08a, 2-08b, 2-14a

Activity

Estimating and mapping the rubbish footprint of waste sent to landfill each week from individual households, the households of everyone at the school and all the households in Great Britain.

Introduction

UK households produced 26.7 million tonnes of waste in 2014, of which 44.9% was collected for recycling (source: www.gov.uk). This figure is still quite low compared to some of our neighbouring EU countries, some recycling over 50% of their waste. There is still a great deal of waste which could be recycled that ends up in landfill sites which is harmful to the environment.

We generate about 177 million tonnes of waste every year in England alone. This is a poor use of resources and costs businesses and household's money. It also causes environmental damage – for example, waste sent to landfill produces methane, a powerful greenhouse gas. <https://www.gov.uk/government/policies/reducing-and-managing-waste> (2013)

According to the Office for National Statistics there are 27 million households in Great Britain in 2015. <http://www.ons.gov.uk> (2015)

These 27 million households produce rubbish week by week destined for landfill. Burying our rubbish is unsustainable as we are running out of spaces. It's also costly for the environment because pollutants contaminate soil and water and rotting rubbish produces methane, a gas implicated in global warming. It's difficult to visualise the amount of rubbish we create each year and send to landfill but if we think in terms of the amount of area that it might cover, it can be represented visually using the mapping tools on Digimap for Schools. This helps pupils to better understand the scale of the problem and how important it is to reduce the amount of rubbish we send to landfill.

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Main activity

How much rubbish do we throw out each year that can't be recycled? What would it look like if it was left on top of the ground rather than being buried? How much space would be covered in rubbish? Before calculating what this might look like let's make some reasonable assumptions.

Each household probably on average produces around one bag of rubbish per week (for landfill). If we tipped this rubbish out onto the ground it would probably cover about 1 square metre of ground, if it was spread out.

Tasks

1. Decide as a class how realistic these assumptions are and whether you choose to accept them or not.
 - You might decide to do your own 'area test' using a bag of rubbish, or to send a questionnaire home to find out how much rubbish each household usually puts out per week or fortnight.
 - Or you can accept the 1 sq metre per week per household estimate and make a calculation based on the number of pupils in the schools. Decide with pupils how you can reasonably estimate the number of households represented by people at your school (you will need to subtract from the school total to allow for siblings but add to the number to take account of staff members). For example:

Each household creates 1 sq metre of rubbish each week = 52 sq metre per year.

A school with 200 pupils and staff would create about 200 sq metres of rubbish x 52 weeks = 10,400 sq metres per year (see the table below to help pupils calculate this).

Since there are 1 million square metres in a square kilometre that would mean that for every million households, a kilometre square of rubbish could be created each week. That is about 26 square kilometres of rubbish each week for the households in Great Britain or 1,352 square kilometres per year.

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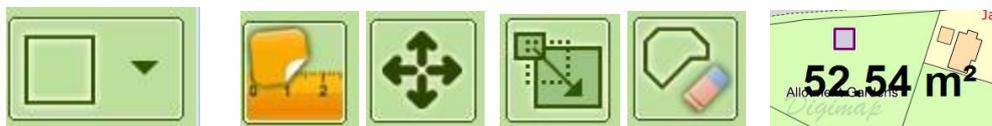
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This is a table of rubbish production based on the assumption that a household produces a square metre equivalent of rubbish per week.

Number of pupils in school (adjust to represent approximate number of households)	Rubbish produced per week (1 M ² x no. of households) Square Metres	Rubbish produced per year (weekly total x 52 weeks) Square Metres
100	100m ²	5200m ²
150	150	7800
200	200	10400
250	250	13000
300	300	15600
350	350	18200
400	400	20800

- Pupils are going to 'spread' their own household's rubbish of 52 sq metres on to a map of their house.

 - Open Digimap for Schools and ask pupils to find their house using postcode search.
 - Open the Annotations Toolbar and select colour outline and fill, ensuring 'Transparency' is set to 50%.
 - Select 'Draw a shape' tool, choose the 'Draw an area with straight edges' and draw a **small** shape anywhere on the map. By choosing the 'Add a measurement label' and clicking on their shape, pupils can see how big or small it is in square metres.
 - To move items on the screen use the arrow and click on what is to be moved. To delete select the eraser and click on the item to be erased. Using these tools they should be able to create a straight sided shape that is **approximately** 52 sq metres in area.



- When they are happy with the shape area, pupils should centre it over their house. Discuss with the class what would happen if there were no landfill sites and everyone had to keep their rubbish at home. What would they do with it?

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3. Pupils should now zoom out and re-centre their map on the school, repeating the above exercise to show the annual rubbish footprint of all staff and pupils at the school.
 - Draw a square covering approximately the area required and use the modify tools until it is approximately the right size. Add labels and discuss the fact that this is just ONE year's worth of rubbish. How much of your school grounds would a year's worth of rubbish blot out? Where would you 'dump' it?



4. Finally, repeat the exercise using the assumed national figures of 26 Km² rubbish per week from the 26 million households in Great Britain and 1352 Km² per year. Ask pupils where they would put it on the map of Great Britain and to explain why? Would this much rubbish blot out an entire city?

TIP: this will be a large area so when moving it zoom out until you can just see the shape then click on the Move tool, click on the shape and drag to new position. You can zoom in then and position it more carefully.

5. Use the headlines in 'Presentation Rubbish Headlines' to talk about the problem of land fill and rubbish and how we might reduce what goes in our bins.

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Taking it further

- Share your findings with parents, the local community, and even the local press. Use your maps in posters designed to encourage people to recycle more rubbish.
- Find out how you can monitor rubbish produced by the school premises or pupils' own homes and use maps to show regular updates.
- Map the journey your rubbish makes from home to tip.
- Arrange a field trip to the nearest landfill and recycling centres.
- What did people do with their rubbish in the past? What do people who live abroad in remote areas (or illegal dwellings) where there is no collection?
- Discuss if it is fair for one country to export its rubbish to another country.

Web links

Eco – School links

- <http://eco-schools.org/>
- <http://ecoschoolsscotland.org/>
- <http://eco-schools.org.uk/>

Other links

- Young People's Trust for the Environment www.ypte.org.uk/environmental/recycling/93
- Convert square Metres to square Kilometres <http://www.asknumbers.com/square-kilometer-tosquare-meter.aspx>

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