

Activity Sheet 1

Researching climate change

In this task you are going to search for information about climate change and its causes. You will consider some of the different viewpoints on climate change. You will be asked to evaluate your sources.

1. Searching for *Climate change*, for example, lists thousands of results from different sources. Which of these will be most relevant? How can you find out whether a site is going to be useful?



- **Choose a site that is reliable**

Think about which sites are likely to be more reliable. Sites with '.gov' are government websites. Those ending in 'gov' are US sites, those ending in 'gov.uk' are from the UK. Sites ending in 'org' may be from organisations that have a particular viewpoint they want to tell you about. 'UN' means a United Nations site. Also think about sites from broadcasters such as the BBC.

- **Choose a site that is for young people**

Some sites have, for instance, 'kids' in the title which gives a clue to who the site is meant for. Add '+kids' to your search phrase to find sites that are likely to be suitable for young people.

- **Choose a topical site**

Click on Google News for up to the minute results for your search.

- **Find images**

If you want to find images rather than text, click on the Images link before typing in your search phrase.

2. Carry out your research using Google to find out answers to the questions below:

- What is climate change?
- What causes climate change?
- It is thought that one of the causes of climate change is carbon dioxide (CO₂). Why does CO₂ contribute to climate change?
- Where does CO₂ come from?
- Why has CO₂ been increasing?

Remember that you can also click on News above the Google search bar to find relevant news stories. You can click on 'Sorted by date' to find the most recent articles and see some of the current issues being discussed.

3. You will find while carrying out your research that there are different viewpoints about climate change and that not everyone agrees about its causes. It is important to find out about different sides of the argument. Try searching for *climate change arguments* and *climate change viewpoints*.

4. Once you have carried out your research into climate change using Google Search, your next task is to evaluate your search results – which was the most useful site and why?

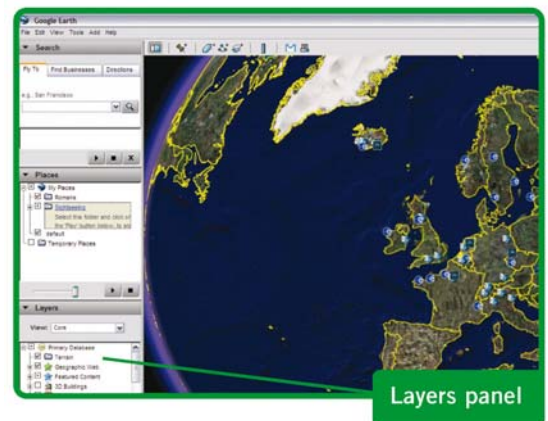
Google search phrase	Write down the URLs you have looked at. Which site was best? Why did you choose it?
"Climate change"	
"Greenhouse effect"	
"Carbon cycle"	
Add your own search phrase here	

Activity Sheet 2: Researching climate change

Key question: What is the impact of climate change?

In this task you are going to use Google Earth to see how climate change could affect our planet. You will then create your own presentation to show some examples of its impact around the world.

1. Start Google Earth then look at the list of layers in the Layers panel which is in the bottom left corner.



Layers show information placed on top of the Google Earth satellite images of the Earth. For example, they show the borders of countries and the names of cities, or buttons which link to photos of places.

2. Experiment with the different parts of the Layers panel. You can switch different layers on and off by clicking on the relevant boxes to tick or untick them. See what happens to the Google Earth view.
3. You can use the layer panel to find out more about climate change:
 - Click the plus icon next to Global Awareness in the Layers list.
 - You will see that it expands to show more layers.
 - Look for the UNEP icon – this stands for United Nations Environment Programme.
 - Click the tick box next to it to switch on this layer.

The UNEP 'Atlas of Our Changing Environment' shows photos of places around the world where the environment is changing.

You can find information on different places by looking for the square blue and black UNEP icons as you explore Google Earth.

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There are different reasons why these places are changing. For example, some are to do with urban areas becoming larger and increasing population size. However, others may be caused by climate change.

4. Use the UNEP 'Atlas of Our Changing Environment' to find out about retreating glaciers.
 - Click on the UNEP icon over Greenland to get information on the retreating Helheim glacier. This contains two photos to compare.
 - Click on Iceland's UNEP icon to see an overlay in a box and get an overlay photo to show iceberg calving.
 - Click on further information to get more detailed information and pictures.

This can also be viewed on a Google Map on the UNEP website:
http://na.unep.net/digital_atlas2/google.php

5. Have another look at the UNEP icons on Google Earth. Find three other examples of the impact of climate change on the environment.

1. _____

2. _____

3. _____

6. Use Google Search to find out more about these three places and the impact that climate change has had on them. Create a short presentation with a slide about each place.

You can use Google Images to find suitable pictures for your slides. Click the picture you want. Find it on the web page it is on and right-click. Select copy, then paste it into your document.

Activity Sheet 3: Researching climate change

Key question: What is the carbon footprint of our journey to school?

Your task is to calculate the distance you travel to school every day and to consider how your method of transport affects the environment.

1. Go to the Google web site and click on Maps.

Click on My Maps and then click in the box next to 'Distance measurement tool' to add this tool.

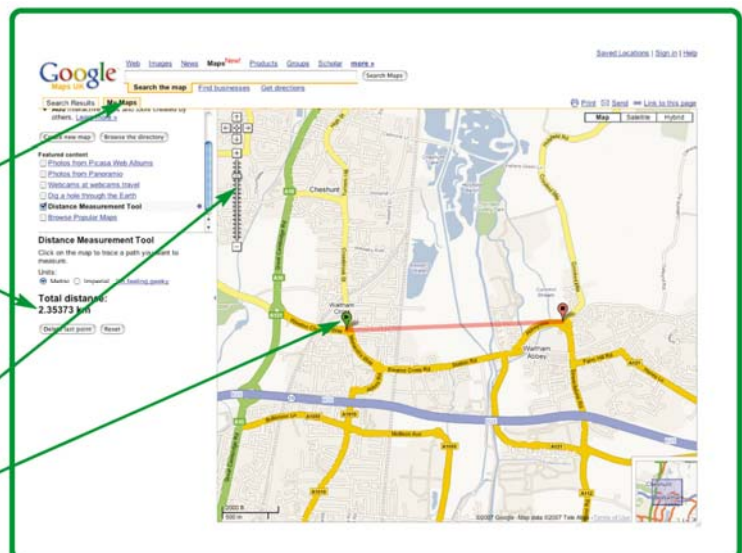
Follow the instructions below to measure your distance to school using Google Maps.

1. Click on My Maps to bring up the list of featured content

2. Click on metric to choose metres and kilometres. The total distance is shown here.

3. Zoom in and out with the slider

4. Start by clicking on the map and then click along your route to the end.



The distance from home to school on the map shown above is 715.9 metres.

1. How far is your journey?

2. How do you travel?

3. Will you generate more carbon dioxide if you walk, go by bus, train or car?

Activity Sheet 4: The UK's carbon footprint

It is thought that carbon dioxide (CO₂) is causing climate change and damaging our planet. You can find out how much carbon dioxide you produce each year using the Google UK Carbon Footprint Calculator.

The calculator will help you to think about what actions you could take to reduce your carbon footprint.

1. To discover your carbon footprint, you must first find out all of the information on this sheet. You might need to ask an adult at home about some of the questions. You can also estimate the answers first to help you think about them.
2. When the sheet is filled in, you can enter it into the Google UK Carbon Footprint Calculator at school.

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Name _____ Date _____

Question	What I think	Correct answer	Notes
Your Home			
1. What kind of property do you live in?		Flat/apartment Maisonette Mid-terrace house End-terrace house Semi-detached bungalow Detached bungalow Semi-detached house Detached house	This helps to work out how much heat your home needs.
2. What's your postcode?			This can be used to add your information to a carbon footprint map of the UK.
3. When was your home built?		Pre 1930s 1930–1995 Post 1995	Older houses usually need more heat to keep them warm. Pre means before. Post means after.
4. How many bedrooms do you have?		1 2 3 4 5+	This helps work out how big your house is.
5. How many people live in your home?		1 2 3 4 5+	This is needed to work out each person's individual carbon footprint.
6. Which of the following do you have?		Cavity wall insulation Loft insulation Double glazing	Insulation and double glazing prevent heat escaping from houses.
7. What's the main heating source for your home?		Electricity Gas Oil Biomass Coal Liquid Petroleum Gas	Some heating fuels produce less CO ₂ than others.
8. How much is your annual heating bill?		£ _____ I don't know	Your heating bill shows how much energy you use. If you don't know the answer the calculator can work out a likely figure.

Question	What I think	Correct answer	Notes
9. How much is your annual electricity bill?		£ _____ I don't know	This shows how much electricity you use each year.
10. How many of your lightbulbs are energy efficient?		None Some Most All I don't know	An energy efficient lightbulb uses a fifth of the energy of a standard lightbulb.
11. How many of your appliances (dishwasher, washing machine, fridge, tumble dryer) are energy efficient?		None Some Most All	Energy efficient appliances use less power every time you use them, saving you CO2 and money.
Your Travel			
12. How many personal return flights do you take in a year?		Short flights (up to 1 hour) Medium flights 1 to 4 hours) Long flights (4+ hours)	Air travel makes an increasing amount of CO2.
13. Which type of vehicle do you own?		My family doesn't own a vehicle Car Scooter / motorbike	Transport forms a big part of your CO2 footprint.
14. Which type of fuel does your vehicle use? (If applicable)		Petrol Diesel Petrol / electricity Hybrid	Different fuels produce different amounts of CO2.
15. What size is your vehicle's engine? (if applicable)		Small Medium Large	Bigger engines usually give off more CO2
16. What's your annual mileage?		_____ miles	The UK average is 9,000 miles per year

Activity Sheet 1: The UK's carbon footprint

Thinking Skills – Card-sorting activity

Notes for the teacher:

- In advance, photocopy the second page of this activity sheet for each group, cut out the cards and mix them up. The information on the cards is taken from the Google UK Carbon Footprint Calculator and serves as a good introduction to the project.
- Explain to pupils that all of us can contribute to reducing carbon dioxide emissions and therefore our carbon footprints by changing our lifestyles.
- Ask them to brainstorm ways they might do this.
- Divide the class into groups of three and hand out the mixed up sets of cards below to each group. Ask pupils to sort them into the following groups:

Appliances	Travel
Home insulation	Heating and lighting

- Ask pupils to sort the cards from easiest to hardest based on the effort required to achieve them. Lead a discussion about which of the suggestions from the card-sorting game would be easiest to realise.
 - Why would others be more difficult?
 - How could they work with their families to implement some of the suggestions at home?
 - Which do they do already?
- Ask pupils to re-sort the cards from easiest to hardest to show how costly they would be to do. Is this the same order as before? Then ask them to pull out all those that they do already.

Card sorting – Reducing your carbon footprint

Install double glazing.	Double glazing works by trapping air between two panes of glass creating an insulating barrier that reduces heat loss, noise and condensation. Double glazing cuts heat lost through windows by half.
Switch to energy-efficient light bulbs throughout your home.	This will save energy and cut electricity bills.
Fill your kettle with only as much water as you need.	Boiling more water than you need for a cup of tea wastes energy and time.
Lower your thermostat by 1 degree.	This should reduce the heating bill by about 10%.
Turn off the light when you leave a room.	This will save energy and cut your electricity bills.
When you can, take the train instead of flying.	Flying gives out more than twice as much CO ₂ as trains.
Turn your appliances completely off (not on standby).	Leaving appliances on standby wastes energy. It is possible to save between 5 and 10% on the electricity bill.
Unplug mobile phone and other chargers when you are not using them.	Chargers use energy whenever they're plugged in.
Turn down your TV display brightness.	Manufacturers set them to their brightest levels for display in showrooms. Turning it down will save electricity.
Defrost your freezer at least once a year.	This will keep it working as efficiently as possible.
Install a hot water jacket.	Insulating the hot water cylinder is one of the simplest and easiest ways to save energy and money. Fitting a 'jacket' around the cylinder will cut heat loss by over 75%.
Use public transport for local trips where possible.	Using public transport instead of a car typically reduces journey related emissions by half.
Install loft insulation	Without loft insulation you could be losing as much as 15% of the heating costs through your roof. Loft insulation acts as a blanket, trapping heat rising from the house below.
Walk or cycle for journeys less than 1 mile	A car journey of less than 1 mile is the most inefficient type of journey as the engine does not have time to warm up properly and hence burns more fuel.