

FUTURE TRAVEL

Research Project
For Teachers **p2&3**, for Students **p4**

HEALTH AND SAFETY

Students should be encouraged to make their own risk assessment before they carry out any activity, including surveys. In all circumstances this must be checked by a competent person. Students using specialised equipment should be supervised at all times.

Combustion of fuels requires careful risk assessment and close supervision. Students should plan and carry out their project, but all practical work must be vetted.

The aim of the project is to investigate how CO₂ emissions can be measured. Petrol and other low flash point hydrocarbons must not be used. Alcohols, paraffin, cooking oil and gaseous fuels may be acceptable.

Students may want to set up unorthodox experiments and you may need to seek specialist advice. Organisations such as CLEAPSS and the Royal Society of Chemistry are able to help.

FUTURE TRAVEL:

Bronze Research Project - For Teachers



Commuters can offset their carbon footprint

Every day, millions of people travel to work or school. They use cars, buses and trains – which all leave a carbon footprint. To pay for this footprint, some commuters use schemes called 'carbon offsetting'. They use online calculators which work out the carbon footprint of their daily commute. Then they pay some money. The money goes towards projects that reduce the emission of greenhouse gases. Some people think this is a great idea. Other people think we should just be greener – and walk to work or school!

HAVE YOU EVER WONDERED?

...what 'offsetting your carbon footprint' actually means? How you can do it?

...whether offsetting really helps the environment? Wouldn't it be better to make smaller footprints in the first place?

You might like to imagine yourself in a situation such as...

Your School Council wants to encourage pupils, parents and staff to use less energy. Council members have agreed to look into various ways to do this. You have volunteered to look at travel and transport.

So, your task is to **research information** on how to reduce the carbon footprints left by:

- people travelling to and from school
- transporting goods and materials used in school.

Prompts

The **Student Brief** gives some triggers to start students thinking. They should realise that each trigger implies several items to research and compare. Encourage students to identify these themselves. However, if necessary, prompts such as those below might be given, to point students in suitable directions.

- **What is a 'carbon footprint'?**
 - How big is the average person's carbon footprint?
 - How much of this is due to travel and transport?
 - Why do people who use public transport instead of cars have smaller travel footprints?
- **How can someone work out the size of their own carbon footprint?**
- **What's the difference between offsetting your footprint and reducing its size?**
- **How easy, or difficult, is it for most people to reduce their travel footprints?**
- **How does offsetting help the environment?**
 - Does offsetting reduce CO₂ emissions? If so, how?
- **If not, what use is it?**
 - Where does the offset money go, and what is it used for?
- **How can the school reduce the transport footprint of goods and materials?**
 - Where did the goods and raw materials originally come from?
 - Why doesn't the school not use alternatives made or grown more locally?
- **How can you persuade pupils, parents and staff to reduce and to offset their travel and transport footprints?**
- **How can you convince them that 'every little helps'? What evidence can you offer them?**

Internet search

Combine 'carbon' with terms such as 'footprint', 'emission', 'reduction', 'travel', 'transport', 'food transport' and 'offset'. Or try:

- **Global warming issues (including cars)**
eon-uk.com/EnergyExperience/509.htm
- **Greenhouse effect**
eon-uk.com/EnergyExperience/486.htm
- **Carbon surveys for schools**
carbontrust.co.uk/energy/assessyourorganisation/surveys-for-schools.htm
- **Calculate your own carbon footprint**
carboncalculator.direct.gov.uk/index.html
- **Analysis of CO₂ emissions for trains**
bestfootforward.com/media/upload/report/East_Coast_Line_Report.pdf

POSSIBLE EQUIPMENT, MATERIALS AND RESOURCES

Access to:

- The internet
- Library books and magazines (such as New Scientist) – possibly archived in school or public library
- School records on goods ordered, showing where they have been sent from and how they were transported.

Suggestions for supporting students

Students must research and select information for themselves. However, they may need some direction from you to identify suitable sources of relevant information at an appropriate level.

Although Bronze Award students are not expected to have an official Mentor for their project, access to expert advice makes students feel their work is important. Also, if the topic is not in your area of expertise, you will find a Mentor valuable. Your CREST Local Coordinator may be able to suggest suitable contacts.

Depending upon the research, someone with knowledge and/or experience of one or more of the following could be ideal:

- **quantifying CO₂ emissions / measuring carbon footprints for people and transported goods**
- **comparing CO₂ emissions from different modes of transport – public and private**
- **environmental effects of emissions**
- **a carbon offsetting scheme**
- **a car sharing scheme**
- **students must decide their focus, although this may alter in the light of experience as the project progresses.**

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information on how to reduce the carbon footprints left by:

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Some things to think about...

- What is a 'carbon footprint'?
- How can someone work out the size of their own carbon footprint?
- What's the difference between offsetting your footprint and reducing its size?
- How does offsetting help the environment?
- How can the school reduce the transport footprint of goods and materials?

Health and Safety

Should you decide to carry out any experiment or practical activity:

- (a) find out if any of the substances, equipment or procedures are hazardous
- (b) assess the risks (think about what could go wrong and how serious it might be)
- (c) decide what you need to do to reduce any risks (such as wearing personal protective equipment, knowing how to deal with emergencies and so on)
- (d) make sure your teacher agrees with your plan and risk assessment

NOTE: Your teacher will check your risk assessment against that of your school. If no risk assessment exists for the activity, your teacher may need to obtain special advice. This may take some time.

- (e) if special tools or machines are needed, arrange to use them in a properly supervised D&T workshop.