

# CLEAN ENERGY VEHICLES

In this activity you are going to make an energy-saving vehicle.

You will need some materials  
to make your vehicle out of.  
Here are some suggestions:

- Card
- Wooden rods and wheels
- Sellotape
- Scissors
- Clean recycling



## Section 1: Introduction

Hello! Our names are **Ellie** and **Louise** and we are research scientists at **Imperial College London**. This means we do experiments to discover new things about the world around us. Our scientific research looks at how we can use hydrogen as fuel for things like cars instead of petrol or diesel which are bad for the environment. Louise is investigating a new way of producing hydrogen fuel and Ellie is investigating new materials to help improve the conversion of hydrogen into energy.

Unfortunately, due to COVID-19, we are not allowed in our laboratories; however, we are still working very hard at home. We need your help! **Can you design a vehicle to help the environment?**

Nice to meet you!  
My name is Ellie.

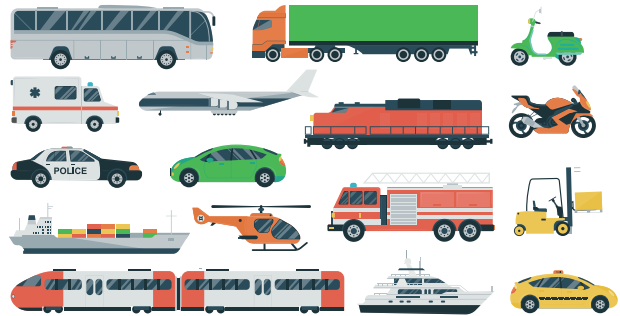


Hello there!  
My name is Louise.



## Section 2: A Global Challenge

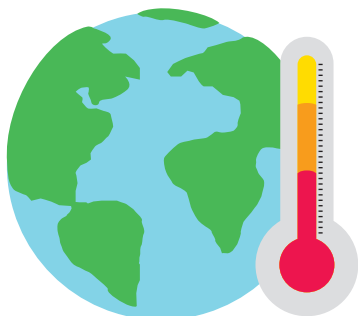
How many different types of vehicles do you know? Chat with your family.



Did you think of cars, buses, motorbikes, aeroplanes, coaches and trains? You also may have thought of some others as well!

Most vehicles are currently powered by burning petrol or diesel. This means they need petrol or diesel to work. Petrol and diesel are made from a fossil fuel called crude oil. Coal and natural gas are also fossil fuels. These materials are called fossil fuels because they are made from fossils – the remains of dead animals, plants and other living things that lived a long time ago. Fossil fuels are a finite resource. This means they are being used up faster than they are being made and will **soon run out**.

The other big problem with fossil fuels is that when they are burnt they produce greenhouse gases, especially one called carbon dioxide. Greenhouse gases trap heat in the Earth's atmosphere. This is also known as global warming. Global warming means the Earth is becoming too hot and it leads to **climate change**. This is very harmful for the Earth and our environment. Do you know any effects of climate change? Have a talk with your family and write down or discuss what you know about it already.



Although it sounds worrying it's not all bad news! Recently, scientists and engineers have been working together to design new vehicles that do not run on fossil fuels to help reduce the bad impacts of climate change.

**Electric vehicles** are a very good and popular alternative to petrol cars because they use batteries to power them and batteries do not release any carbon dioxide. The batteries are charged using electricity (from a big plug) and sometimes, this electricity can be made without burning fossil fuels. This is clean electricity. Some ways of producing clean electricity are:

- **Solar Power** – electricity is made from sunlight using solar cells and panels.
- **Wind Power** – electricity is made when the wind spins a turbine.

**Hydrogen-powered vehicles** are also an alternative to petrol and diesel cars. Hydrogen can be changed into electricity using a device called a fuel cell. This electricity powers the vehicles without releasing any greenhouse gases into the environment.

Another alternative are **biofuel-powered vehicles**. Biofuel is made from natural materials such as plants and trees. When it is burnt, biofuel produces energy that can power the vehicle. Although this process releases carbon dioxide, it only releases carbon that was taken from the air when the plant was grown in the first place, so it doesn't cause more climate change!

## Section 3: Get creating

Your task is to **design and make a new environmentally-friendly vehicle**. You can use things that you may have at home (like boxes and plastic bottles) to design and make your new vehicle.

Here are five steps to help you in your design process.

### → 1 Choose a vehicle type.

What kind of vehicle will you make? Maybe a car, train, plane, or something else!

### → 2 Choose how your vehicle will be powered.

Choose one or more out of electric (solar or wind), hydrogen and biofuel.

### → 3 Decide how your vehicle will move.

Does it need wheels, wings or something else? Maybe it has legs? Be as creative as you want.

### → 4 Think what your vehicle will look like.

Your vehicle needs to be comfortable to sit in and exciting to look at so that everyone wants to use it.



### → 5 Add new and exciting features to your design that can also help Earth and our environment.

Your car could have electric arms that pick litter as it drives, or your aeroplane could water plants as it flies over the world. Perhaps your train could be covered in a special paint that absorbs carbon dioxide. Use your imagination and be creative – whatever you say goes!

After you've thought about your vehicle, you can start making. This is a great chance to re-use some items like plastic bottles, cans and cardboard that might have been in your recycling. Bottle caps make great wheels, boxes make great car bodies, fold and bend paper to make smooth shapes. Be creative, for example toilet tubes can make rockets, car bodies or wheels. You can use the items from the pack too.

**We've also made a sheet to help you plan or record your vehicle on the next page.** It's up to you if you make first then draw, or draw first and then make your vehicle, we all work in different ways!

**Draw your vehicle here.  
Label any features that it has.**



**Explain why you have designed your vehicle this way. How does it work?  
What makes it special and better for the environment.**

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