# Part 1: Design a junk car

# Background

Cars need energy to make them go. Where do they get their energy? If a car was at the top of a hill, could it roll to the bottom? In this case, what makes it go? What would make the car stop?

In this investigation your task is to make a car from junk materials and roll it down a slope. Your aim is to make your car roll furthest in your class.

Your teacher will supply you with equipment to use or you can bring items from home.

**Equipment** may include:

|  |  |  |  |
| --- | --- | --- | --- |
| egg carton | plastic bottle | cardboard | straws |
| milk carton | sticky tape | plastic lids | kebab sticks |
| paper towel roll | split pins | foam packaging | blu tack |
| old pens | masking tape | large buttons | cotton reels |
| thumb tacks | paper clips | cardboard box | pop sticks |
| old nails | tissue box | rubber bands |  |

To test your cars against each other your teacher will provide a ramp and measuring equipment.

# Planning

It is important to think of a plan before you start. What are you going to use to make your car? How will the wheels roll?

1. Draw a labelled diagram of your design.
2. Write a list of equipment you’ll use.

1. How will your class make sure this is a fair test? What variables need to be controlled when testing which car travels furthest?

# Trials

1. How far did your car travel? Why did it stop?

1. Are there any modifications you could make to your car so it travels further? Make these changes.

**Results**

1. Measure the distance your car travelled. You may like to do a few trials and calculate an average.

# Processing results

1. How well did your car roll down the slope? How did it compare to other groups?

1. Where did your car’s energy come from? How did it use the energy?

# Evaluating the investigation

1. What modifications could you make so you car travels further?

# Part 2: Investigating energy sources

# Background

Traditionally combustion engines have powered cars. However, as concerns about the environment grow and fears are raised about running out of oil, many alternate energy sources are being explored. Some of these energy sources include solar-power, electricity and batteries.

In this investigation your task is to find a way to power your junk car. To do this you’ll attach an energy source to the car you produced in Part 1 of this experiment. You may need to modify your car design.

Your teacher will supply you with equipment you may use to power your car.

**Additional equipment** may include:

|  |  |  |  |
| --- | --- | --- | --- |
| 3 V solar panel | string | balloon | elastic band |
| tea light candle | paper | sodium bicarbonate | matches |
| vinegar | pop sticks | 3 – 6 V DC motor | metal pie dish |
| film canister | tape | cardboard | mouse trap |
| electric leads | straws |  |  |

# Planning

It’s important to plan before you start.

1. Brainstorm possible sources of energy you could use to power your car.
2. Which of these sources of energy will you use? Why?

1. Draw a labelled diagram of your design.
2. Write a list of equipment you’ll use.

# Preliminary trials

1. How far did your car travel? Why did it stop?

1. Are there any modifications you could make to your car so it travels further? Make these changes.

**Results**

1. Measure the distance your car travelled. You may like to do a few trials and calculate an average.

# Processing results

1. How well did your car move? How did it compare to other groups who used different methods to power their cars?

1. Explain how your car worked. Where did your car get energy? Where did the energy go? You may like to draw a labelled diagram to help your explanation.

# Evaluating the experiment

1. If you were to repeat this investigation, what changes would you make? Explain.