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.

.....

.....

.....

.....

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

.....

.....

.....

Trials

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

.....

.....

.....

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

.....

.....

.....

Results

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

Processing results

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

.....

.....

.....

8. Where did your car's energy come from? How did it use the energy?

.....

.....

.....

Evaluating the investigation

9. 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.

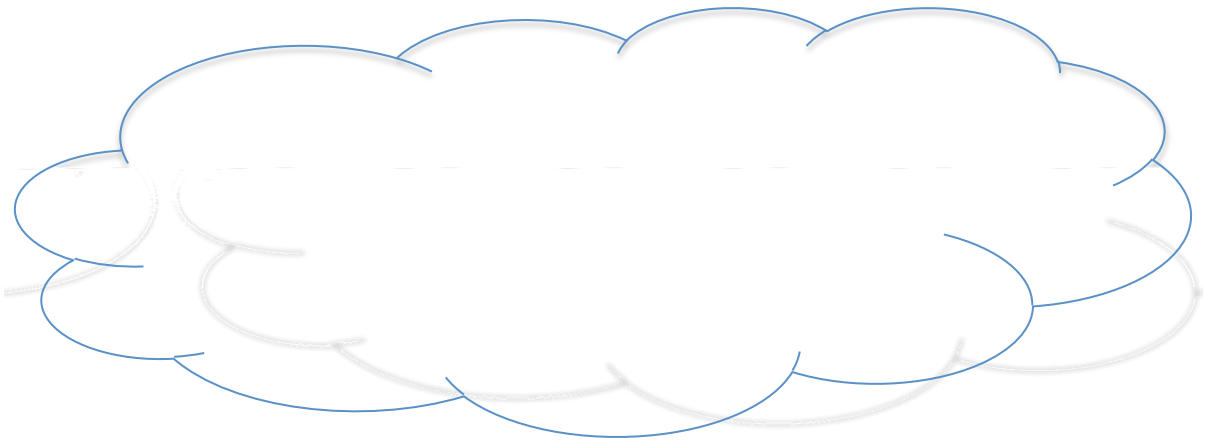
Additional equipment may include:

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?

.....

.....

.....

3. Draw a labelled diagram of your design.

4. Write a list of equipment you'll use.

.....

.....

.....

.....

Preliminary trials

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

.....

.....

.....

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

.....

.....

.....

Results

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

Processing results

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

.....

.....

.....

.....

9. 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

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

.....

.....

.....

.....