

INVESTIGATION - Energy content of food

Aim

To find out how much energy is released when a small piece of food burns.

Risk assessment and planning

1 Read through the experiment, then describe to your partner what you have to do, measure and record.

2 What safety precautions will be necessary?

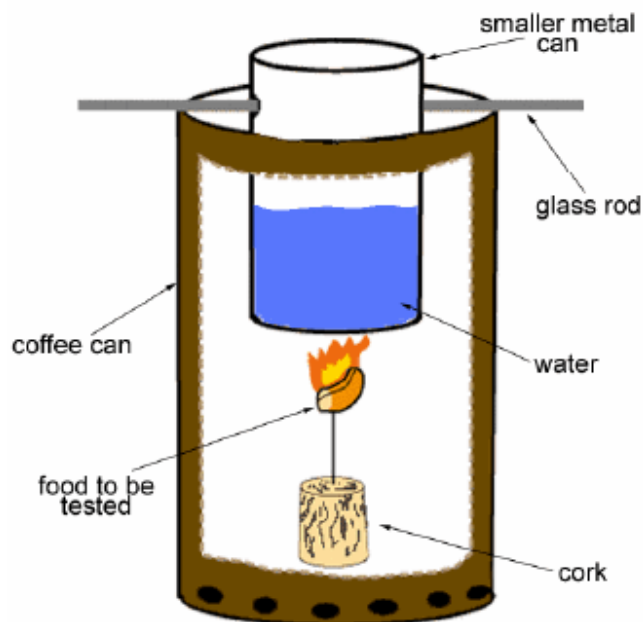
3 What data will you need to record?

Apparatus

- large test tube
- test-tube holder
- small piece of food, e.g. Nutri-Grain or Tiny Teddy
- needle
- stopper
- Bunsen burner
- heatproof mat
- thermometer
- metal can
- measuring cylinder (25 mL)

Method

- 1 Cut the top and bottom out of a metal can, and also cut a door as shown so that you can see the food burning. Put the can on a heatproof mat.
- 2 Pour exactly 10 mL of water into the test tube and hold it in the can with a test-tube holder as shown. Measure and record the starting temperature of the water.
- 3 Push the blunt end of the needle into the stopper and then stick the sharp end into the piece of food.
- 4 Slide the stopper and food under the test tube. There should be a space of about 2 cm between the test tube and the food.
- 5 Get the food to burn in a Bunsen flame and immediately put it back under the test tube.
- 6 When the food stops burning, stir the water *gently with the thermometer*, and *measure the final temperature*.
- 7 If you have time, repeat the experiment with other foods, e.g. nuts, bread, rice, spaghetti. Note that some people may be allergic to burning peanuts.
* Record all your results in your data table.



Results

Design a results table to collect your data.

1 By how many degrees did the temperature of the water increase?

2 It takes **4.2** joules to raise the temperature of **1** ml of water by **1** °C. So, to calculate the heat energy gained by **10** ml of water, multiply the temperature rise by **42**. Your answer will then be in joules. This is the energy released by the burning food.

3 Which of the foods you tested contained the most energy?