



BRONZE AWARD PROJECT IDEAS



typically 10 hours of project work



A Balanced Diet - What's in a food?

Before you start your investigation, you should carry out a risk assessment and have it checked by your teacher. For help with this, read through our health and safety information and look out for health and safety warnings in the text.

In this project, you will test a range of foods to find out if they contain protein, fat, reducing sugar or starch. You will then do an experiment to work out how much energy is in each of the foods.

Getting started

You should start this project by selecting different types of foods to test – about five should be enough. Suitable foods include: cornflakes, rice, carrot, potato, apple, raisin, bread, pasta, crisps (ask your teacher if you want to use something else).



Be aware some people are allergic to certain foods.

Testing food

You're going to start by carrying out four food tests. These will tell you if the food has any protein, fat, reducing sugar (such as glucose) and starch. First of all, mash up your foods using a pestle and mortar. Then separate each one into four, so that you can carry out all four food tests on each food sample. You will need to ask your teacher how to do the food tests - the tests won't tell you how much of each thing is in the food, just whether or not there is any. Methods you could use include:

- Protein content – Biuret test
- Fat content – Emulsion test
- Reducing sugar content – Benedict's test
- Starch content – Iodine test.



Be aware hazardous chemicals are used in these tests. See CLEAPSS Student Safety Sheets for more information

Burning energy

Now carry out tests to find out how much energy is in each type of food.

To do this you have to burn the food and see how much it heats up water. You should ask your teacher how to set this experiment up. You'll need a Bunsen burner, a clamp stand, a boiling tube, some water, a thermometer and something to hold the food over the flame (a small non-luminous flame should be okay). Once the food starts to burn take it away from the flame and hold it under the boiling tube of water.

Here are some things to think about:

- Weigh each piece of food before you burn it and write down the mass in grams.
- Make sure you use the same amount of water in the boiling tube for each food type.
- Decide if you should stir the water as it heats up, if so, how will you do this?
- When the flame goes out you should re-light the food - you should keep doing this until it no longer lights. Try to do this quickly so that the water in the boiling tube does not cool down while the food is being re-lit.
- Make sure you take the temperature of the water before you start heating, and immediately afterwards. The difference between these two readings is the temperature rise. Remember to take the temperature readings in °C.

The results

For each type of food, you should have a temperature rise and the weight of the food before burning. If you divide these two numbers you will get the temperature rise per gram. That means you can compare the different foods, even if they were different weights to begin with.

Create a table to display the results of all your food tests.

