GCSE Biology required practical activity: Food tests

Using qualitative reagents to test for a range of carbohydrates, lipids and proteins

Risk assessment

- Safety goggles should be worn when carrying out the tests.
- Wash off spills on skin immediately.
- Take care with boiling water.

Method

You are provided with the following:

- food to be tested
- a pestle and mortar
- a stirring rod
- filter funnel and filter paper
- 2 × beaker, 250 ml
- a conical flask
- 2 × test tube
- Benedict's solution
- iodine solution
- kettle for boiling water
- a thermometer
- safety goggles.

Read these instructions carefully before you start work.

1. Use a pestle and mortar to grind up a small sample of food.
2. Transfer the ground up food into a small beaker. Then add distilled water.
3. Stir the mixture so that some of the food dissolves in the water.
4. Filter using a funnel with filter paper to obtain as clear a solution as possible.
   The solution should be collected in a conical flask.
5. Half fill a test tube with some of this solution.
6. Add 10 drops of Benedict's solution to the solution in the test tube.
7. Put hot water from a kettle in a beaker. The water should **not** be boiling.
   Put the test tube in the beaker for about five minutes.

8. Note any colour change.

   If a reducing sugar (such as glucose) is present, the solution will turn green, yellow, or brick-red. The colour depends on the sugar concentration.

9. Take 5 ml of the solution from the conical flask and put it into a clean test tube.

10. Add a few drops of iodine solution and note any colour change.

    If starch is present, you should see a black or blue-black colour appear.

11. Record your results in a table such as the one below.

Name of food tested	Colour produced with Benedict's solution	Colour produced with iodine solution

2. Testing for lipids

In this experiment you will test one or more foodstuffs for the presence of lipids (fats).

Learning outcomes
1 **2** **3** **Teachers to add these with particular reference to working scientifically**

Risk assessment:

- Safety goggles should be worn when carrying out the tests.
- Sudan III contains ethanol, which is highly flammable. Keep the solution away from naked flames.
- Wash off spills on skin immediately.

Method

You are provided with the following:

- food to be tested
- a pestle and mortar
- a stirring rod
- 2 × beaker, 250 ml
- a test tube
- Sudan III stain solution.
- safety goggles.

Read these instructions carefully before you start work.

1. Use a pestle and mortar to grind up a small sample of food.
2. Transfer the ground up food into a small beaker. Then add distilled water.
3. Stir the mixture so that some of the food dissolves in the water. Do not filter.
4. Half fill a test tube with some of this solution.
5. Add 3 drops of Sudan III stain to the solution in the test tube. Shake gently to mix.
6. If fat is present: a red-stained oil layer will separate out and float on the water surface.

3. Testing for proteins

In this experiment you will test one or more foodstuffs for the presence of protein.

Learning outcomes
1 **2** **3** **Teachers to add these with particular reference to working scientifically**

Risk assessment:

- Safety goggles should be worn when carrying out the tests.
- Biuret solution contains copper sulphate, which is poisonous, and sodium hydroxide, which is caustic.
- Wash off spills on skin immediately.

Method

You are provided with the following:

- food to be tested
- a pestle and mortar
- a stirring rod
- a filter funnel and filter paper
- 2 × beaker, 250 ml
- a test tube
- Biuret solution
- safety goggles.

Read these instructions carefully before you start work.

1. Use a pestle and mortar to grind up a small sample of food.
2. Transfer the ground up food into a small beaker. Then add distilled water.
3. Stir the mixture so that some of the food dissolves in the water.
4. Filter using a funnel with filter paper to obtain as clear a solution as possible.
   The solution should be collected in a conical flask.
5. Put 2 cm^3 of this solution into a test tube.
6. Add 2 cm^3 of Biuret solution to the solution in the test tube. Shake gently to mix.
7. Note any colour change. Proteins will turn the solution pink or purple.