

Your teacher may watch to see if you can...

- follow instructions carefully
- work safely, reducing the risk of harm from hazards.

You will be given a range of powdered foods. Use the tests below to identify whether each food contains the substances that the reagents test for. Use your results to help you identify the foods from the list you are given. Remember to wipe the spatula and stirrer clean between tests with a paper towel, to prevent cross-contamination.

Aim

To identify starch, reducing sugars, proteins and lipids in foods.

Method**Apparatus**

- eye protection
- water
- measuring cylinder
- spatula
- powdered foods
- paper towels
- test tubes, racks and bungs
- stirrer
- iodine solution in dropper bottle
- Benedict's solution
- potassium hydroxide solution
- copper sulfate solution
- ethanol
- cold water
- water bath at 70 °C

**Safety**

Wear eye protection.
Wash any splashes from skin quickly.
Do not taste any of the food substances.
Potassium hydroxide can be harmful to skin and eyes.
Avoid scalding with hot water.

Iodine test for starch

- A** Place one spatula of powdered food on a dish.
B Using a dropper, place a few drops of iodine solution onto the food.
C Record the letter of the food and any change in the colour of the solution.

Benedict's test for reducing sugars

- D** Place two spatulas of powdered food into a test tube. Add about 1 cm³ depth of water to the tube and stir to mix.
E Add an equal volume of Benedict's solution and mix.
F Place the tube in a water bath at about 95 °C for a few minutes.
G Record the letter of the food and the colour of the solution.

Biuret test for protein

- H** Place two spatulas of powdered food into a test tube. Add about 1 cm³ depth of water to the tube and stir to mix.
I Add an equal volume of potassium hydroxide solution to the tube and stir.
J Add two drops of copper sulfate solution and stir.
K Record the letter of the food and the colour of the solution after a few minutes.

Emulsion test for lipids

- L** Place two spatulas of powdered food into a test tube.
M Add 2 cm³ of ethanol to the tube. Place a bung firmly in the end of the tube and shake the tube vigorously.
N Allow the contents to settle.
O Pour the liquid from the top of the mixture into a test tube half-filled with water.
P Record the letter of the food and whether the water is cloudy or clear.

Name _____ Class _____ Date _____

Recording your results

1 Record your results in the table. Add more rows if needed.

Food	Colour at end of ...			
	iodine test	Benedict's test	biuret test	emulsion test
A				
B				
C				
D				

Considering your results/conclusions

2 Which foods contained:

a starch _____

b reducing sugar _____

c protein _____

d lipid? _____

3 Do any of your tests give an indication of how much of a substance a food contains? Give a reason for your answer.

Evaluation

4 Identify any problems you had with this experiment, and explain how the method could be improved to reduce or avoid these errors.
