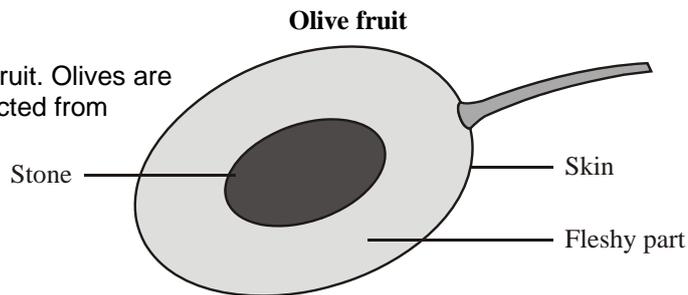


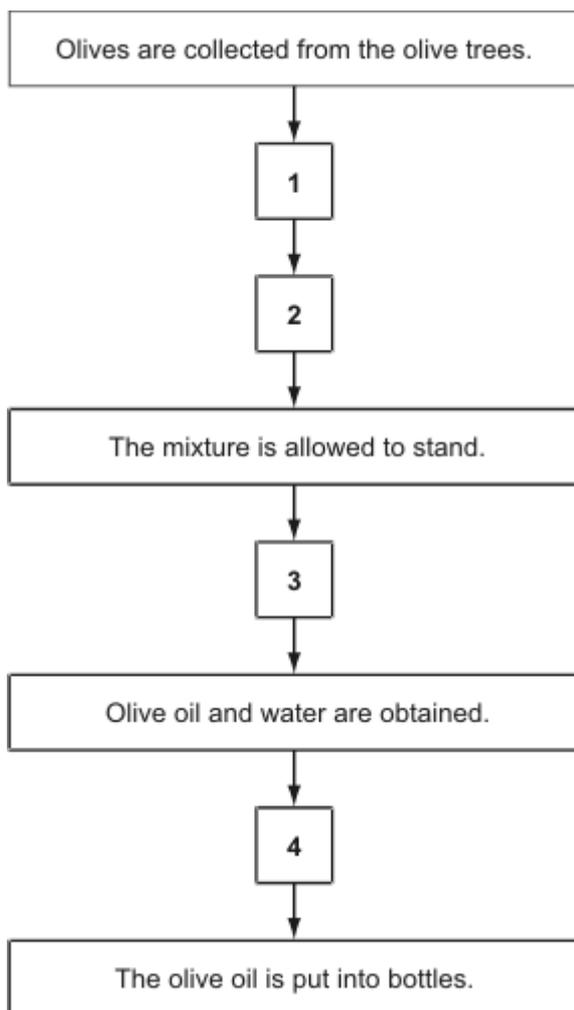
Vegetable oils and emulsions

1. This question is about extracting oil from a fruit. Olives are fruits of the olive tree. Olive oil can be extracted from olives.



The stages in the extraction are shown in the flow chart below.
Match sentences, **A, B, C** and **D**, with the numbers **1–4** in the flow chart.

- A** Olive oil separates from the water.
- B** The mixture is pressed.
- C** Water is added and the mixture is stirred.
- D** The olives are crushed.



Unit C1, C1 .6.1 and C1.6.2

2. Plant oils have many uses.

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

- A** a fuel
- B** an emulsion
- C** energy
- D** temperature

Vegetable oil can be burned as . . . **1**

Vegetable oils are useful foods because they contain a lot of . . . **2**

Vegetable oils cook food at a higher . . . **3** . . . than water.

In some foods, vegetable oil is mixed with another liquid to form . . . **4**

3. Ice-cream is a foam because it has small air bubbles trapped inside it.

Ice-cream is sold by volume. Ice-cream manufacturers increase the volume of air in a product so that they make more money.

A student investigated the volume of air in four different ice-creams, **K**, **L**, **M** and **N**. The four ice-creams were kept in the same freezer.

For each ice-cream, the following procedure was carried out:

- the student measured the volume of some ice-cream straight from the freezer
- the ice-cream was then melted down, allowing the air to escape
- the volume of the ice-cream was re-measured to give the final volume.

The results are shown in the table.

Ice-cream	K	L	M	N
Initial volume in cm ³	100	100	100	100
Final volume in cm ³	96	91	87	95

(a) Which ice-cream originally contained the most air?

- 1** **K**
- 2** **L**
- 3** **M**
- 4** **N**

(b) The investigation was fair because . . .

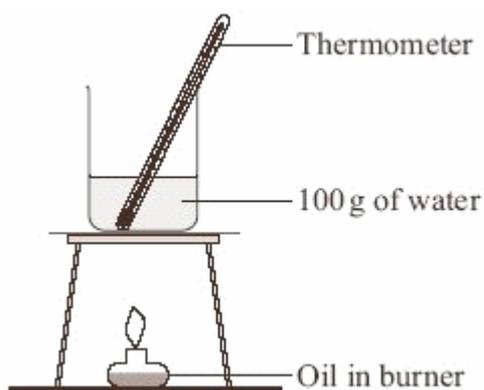
- 1** the same volume of ice-cream was used each time.
- 2** four samples of ice-cream were used.
- 3** the investigation was repeated.
- 4** the temperature of the ice-creams was kept constant during the investigation.

Unit C1, C1 .6.1 and C1.6.2

- (c) The student could have improved the reliability of the investigation by . . .
- 1 allowing the ice-cream to melt over a longer period of time.
 - 2 checking that the temperature was constant throughout the investigation.
 - 3 using more than four ice-cream samples.
 - 4 repeating the investigation.

4. A student was comparing two vegetable oils, **X** and **Y**, to find out how much heat they release when they burn.

She used the apparatus shown in the diagram. The oil was allowed to burn for 6 minutes in each test.



Her results are shown in the table.

	Oil X	Oil Y
Mass of empty oil burner	60 g	60 g
Mass of oil burner + vegetable oil	67 g	66 g
Mass of oil burner + vegetable oil after burning	62 g	63 g
Initial temperature of water in the beaker	24 °C	24 °C
Final temperature of water in the beaker after heating	49 °C	42 °C

- (a) How many grams of oil **X** were burned during the experiment?
- 1 2 g
 - 2 4 g
 - 3 5 g
 - 4 7 g
- (b) Oil **X** produced a temperature rise of 5 °C per gram of oil burned.

What rise in temperature was produced by burning 1 g of oil **Y**?

- 1 3 °C
- 2 6 °C
- 3 18 °C
- 4 42 °C

Unit C1, C1 .6.1 and C1.6.2

- (c) How could the student improve the reliability of the results for each oil?
- 1 Repeat the experiment several times and take the mean (average) value.
 - 2 Burn the same mass of oil **X** and oil **Y** in the tests.
 - 3 Burn the same mass of oil **X** and oil **Y** but for a shorter length of time.
 - 4 Use several other oils and compare the results with those for oil **X** and oil **Y**.
- (d) The student could get more accurate results if she improved the design of her apparatus.

One improvement would be to . . .

- 1 use a larger beaker.
- 2 use a thermometer with a larger range of temperatures.
- 3 burn a smaller quantity of oil each time.
- 4 protect the flame from draughts.