

Investigative Skills

Use the following scenario to answer questions 1 and 2

Kimberley and Glenn were walking past their neighbour's house when they noticed that a front window was broken. Glenn told Kimberley that somebody had probably thrown a ball through the window. They had a closer look and noticed clothes scattered all over the floor and drawers open. Kimberley noticed some blood on the broken glass. She told Glenn that the house had been burgled. Glenn agreed and they called the police.

- 1 The statement 'Kimberley noticed some blood on the broken glass' is:
 - (a) an observation.
 - (b) a hypothesis.
 - (c) a conclusion.
 - (d) an inference.

- 2 Who suggested a hypothesis?
 - (a) No-one
 - (b) Glenn only
 - (c) Kimberley only
 - (d) Both Glenn and Kimberley

3 Charlotte wanted to compare the amount of air in two brands of ice-cream. She placed a large spoon of each ice-cream into two different cups and let the ice-cream melt. She then measured how much liquid was in each cup. There was less liquid in cup B, so she concluded that ice-cream B must contain more air.

(a) Describe one way in which Charlotte could improve the validity of her experiment.

.....
.....
.....

(b) Outline how the accuracy of Charlotte's experiment could be improved.

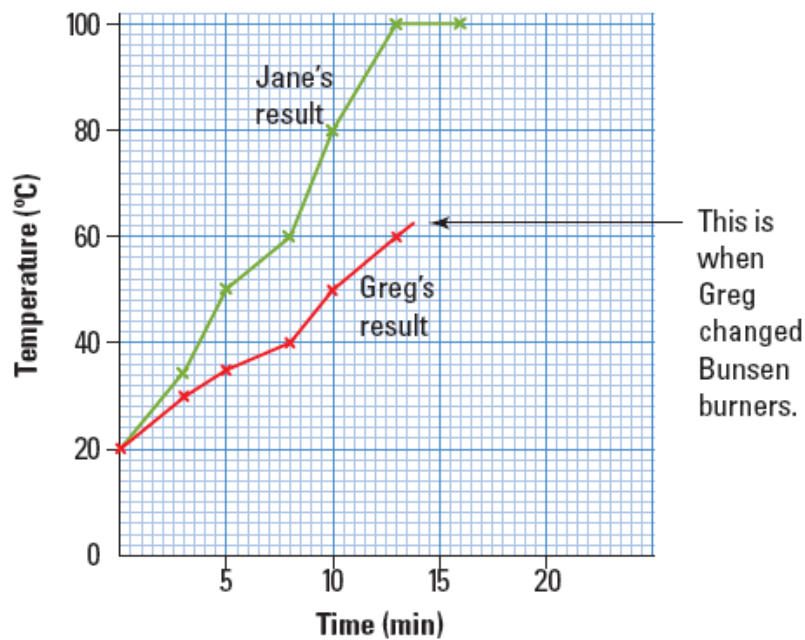
.....
.....
.....
.....

(c) Outline how the experiment could be made more reliable.

.....
.....
.....

Use the following scenario and graph to answer questions 4 and 5.

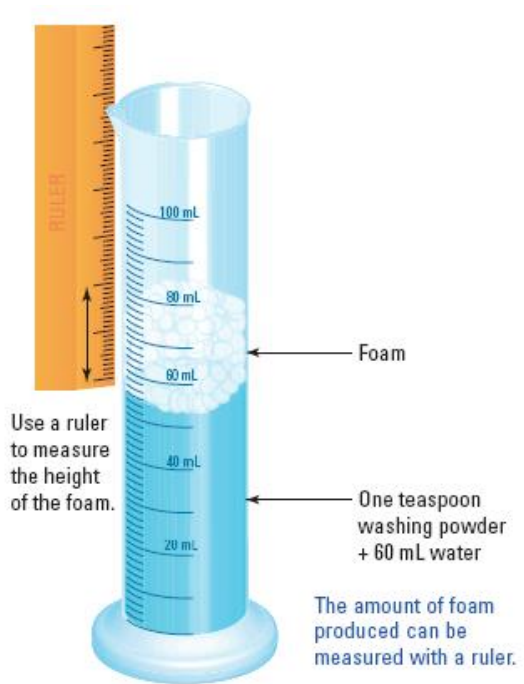
Jane and Greg decided to test how quickly water would boil when using either the yellow flame or blue flame of the Bunsen burner. They set up identical experiments, except that Jane used a blue flame and Greg used a yellow flame. Their results are graphed below.



- 4 What was the temperature of Greg's water when Jane's water reached 100°C?
- (a) 100°C
 - (b) 60°C
 - (c) 62°C
 - (d) 70°C
- 5 Jane removed her beaker and Greg quickly placed his beaker over Jane's Bunsen burner. Assuming that the temperature of Greg's beaker did not drop while swapping Bunsen burners, at what time will his water boil?
- (a) 17 minutes
 - (b) 22 minutes
 - (c) 15 minutes
 - (d) 18 minutes

6 If you have a front-loading washing machine, you should use 'low-sudsing' washing powder, which produces less foam than other washing powders. Emily did the following experiment to compare how much foam was produced by three brands of washing powder.

- She put one teaspoon of each washing powder in separate 100 mL measuring cylinders.
- She added 60 mL warm water to each measuring cylinder.
- She shook each measuring cylinder vigorously.
- She measured the height of the foam produced in each measuring cylinder.



(a) Identify the independent and dependent variables in Emily's experiment.

.....

.....

.....

(b) Identify the variables that Emily controlled?

.....

.....

(c) Which variables could have been controlled better?

.....

.....

.....

.....