

Working scientifically**CC** Civics and citizenship **L** Literacy

Refer to the Learning Across the Curriculum in unit 1.1 in your student book to answer the following questions.

- 1** It is the law that you must wear a helmet when riding a bike. This law is based on scientific evidence gathered over many years.

List the sorts of evidence that may have been collected to support the law about bike helmets.

- 2** It is law that all new cars sold in Australia have airbags. **Propose** a reason why.

- 3** You are not allowed to light a fire outside on a day of total fire ban.

(a) Describe the sort of day that is normally declared a total fire ban.

(b) Propose the sort of evidence that scientists have collected to support such bans.

- 4** **Propose** reasons why laws exist controlling:

(a) the type and amount of additives that can be put in food

(b) how long food can be sold for

(c) the levels of sound, chemicals and dust to which workers can be exposed

- 5** **Describe** an example of how governments around the world made laws that benefited the whole planet.

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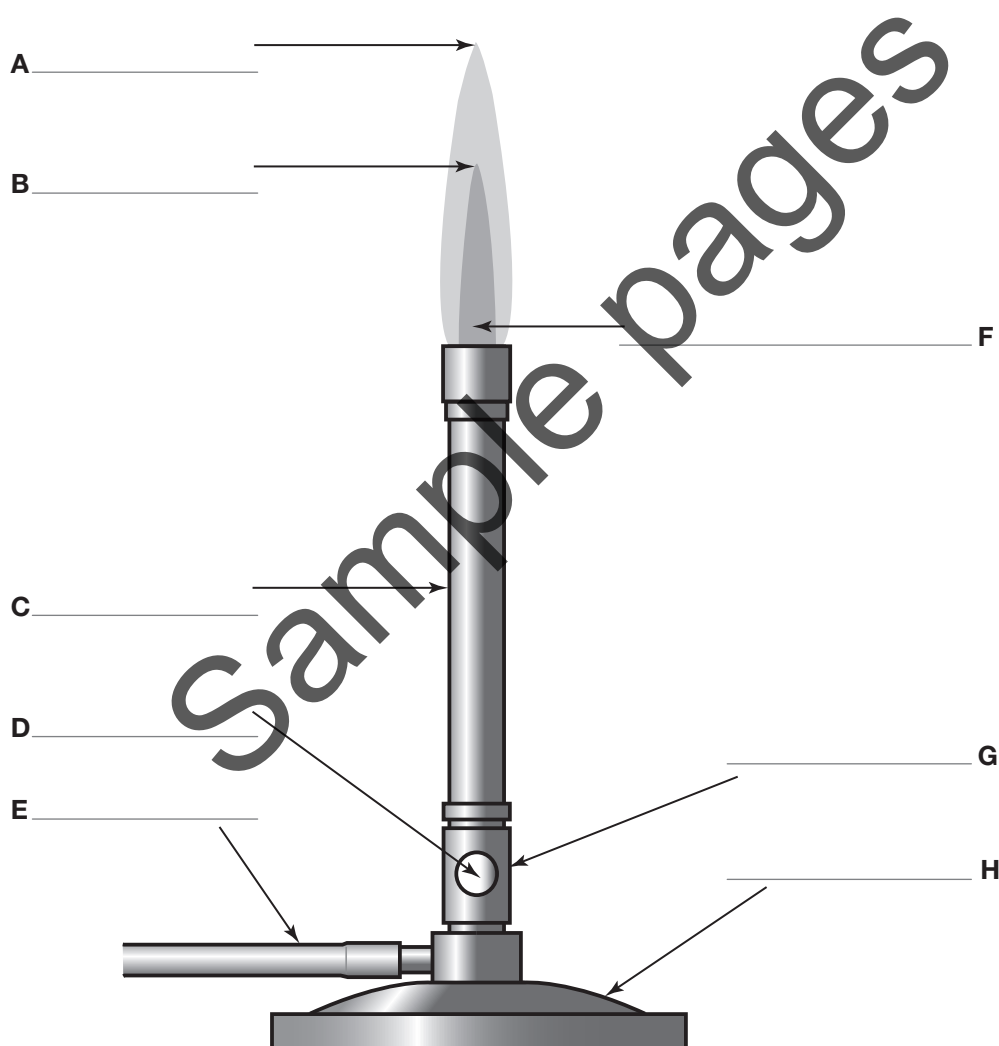
L Literacy

WE Work and enterprise

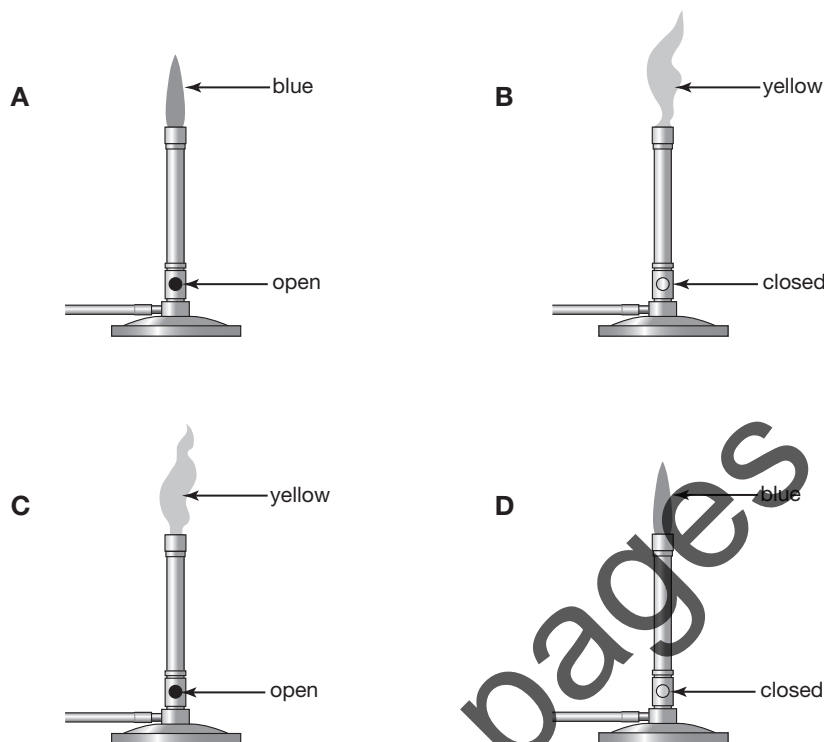
CCT Critical and creative thinking

1 Use the words in the box below to **label** parts A-H of the Bunsen burner.

barrel	hottest part of flame	collar	airhole
base	cone of unburnt gas	gas hose	cooler part of flame



2 Identify which of the following diagrams correctly show the flames that can be produced by a Bunsen burner. (More than one answer is possible.) _____



3 Below is a set of instructions to light a Bunsen burner and to obtain a hot, blue flame. However, the instructions are out of order. **Use** the letters (A-K) to **list** the instructions in the correct order.

- A** Strike a match.
- B** Turn the collar so that the airhole is open.
- C** Turn on the gas.
- D** A blue Bunsen burner flame should be seen.
- E** A yellow Bunsen burner flame should be seen.
- F** Place the Bunsen burner on the bench mat.
- G** Place the match just above the top of the barrel of the Bunsen burner.
- H** Connect the gas hose to the gas tap.
- I** Make sure that the gas hose is flat, not twisted.
- J** Turn the collar so that the airhole is closed.
- K** Place a bench mat on the bench.










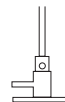







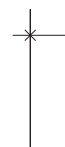

The correct order is:

____ then ____ then ____ then ____ then ____ then ____ then ____ then ____ then ____ then ____ then ____

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- 1 **Construct** lines to connect the names of the laboratory equipment below with their realistic sketch and with their 2D cross-section diagram.

1		A conical flask	i	
2		B tripod and gauze mat	ii	
3		C watch-glass	iii	
4		D measuring cylinder	iv	
5		E evaporating dish	v	
6		F beaker	vi	
7		G crucible and lid	vii	
8		H Bunsen burner	viii	
9		I test-tube	ix	
10		J retort stand, bosshead and clamp	x	

- 2 **Summarise** your results by writing the number, letter and Roman numeral of each combination, for example 1/C/vi.

1/___/___ 2/___/___ 3/___/___ 4/___/___ 5/___/___
 6/___/___ 7/___/___ 8/___/___ 9/___/___ 10/___/___

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In the cartoons below, some students are acting in a safe and sensible way while others are putting themselves in danger.

Identify what each student is doing right or wrong. Underneath each cartoon, **write** a commonsense rule for the laboratory that deals with the situation.



(a) _____



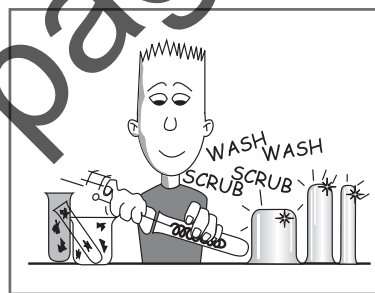
(b) _____



(c) _____



(d) _____



(e) _____



(f) _____



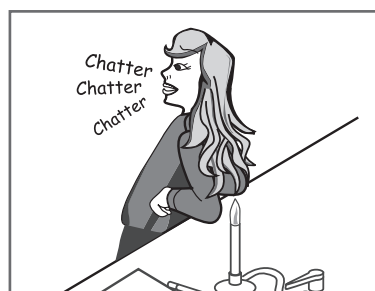
(g) _____



(h) _____



(i) _____



(j) _____

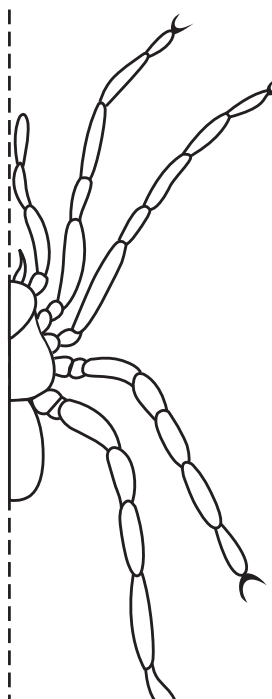
Working scientifically**N** Numeracy **CCT** Critical and creative thinking

Clear, simple diagrams help scientists to explain their observations. For example, biologists often draw detailed diagrams of animals they see.

- 1 An incomplete diagram of a butterfly is shown below. **Use** its symmetry to complete the diagram as accurately as you can. Do not fold the page to help you: instead use the sizes and positions of the important parts of the butterfly, such as its wing tips and antennae.



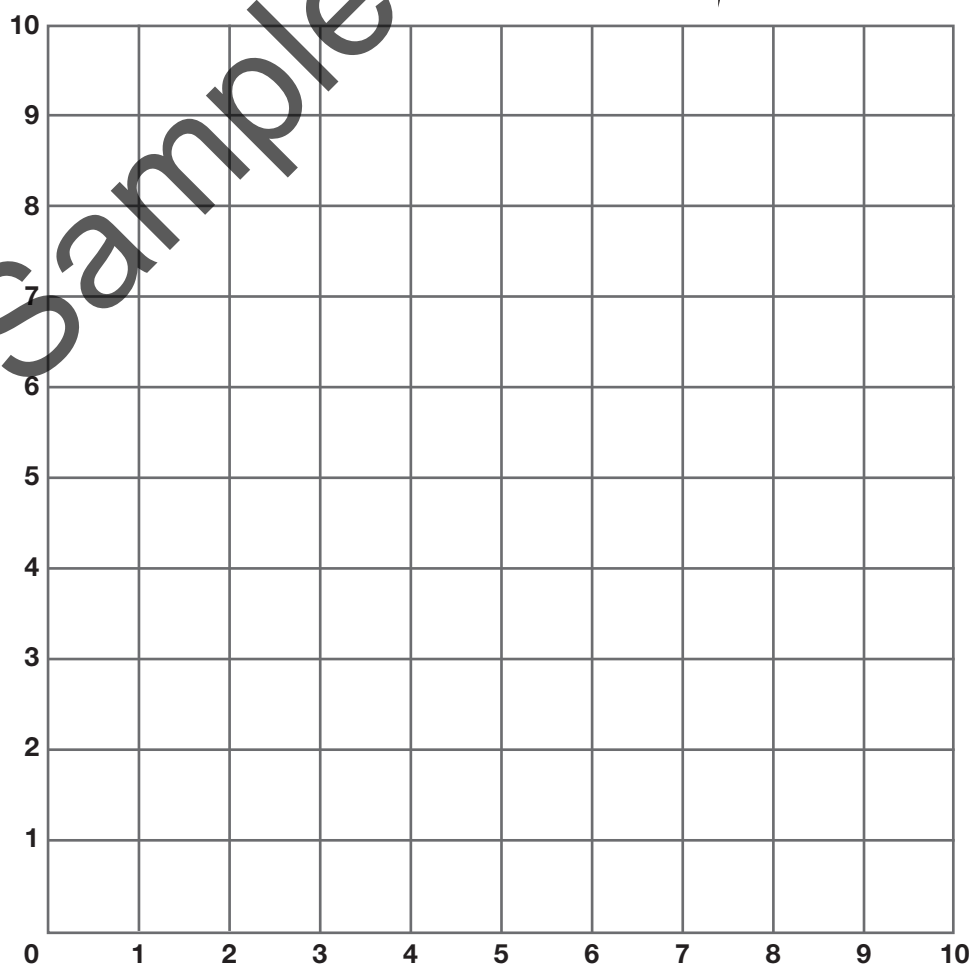
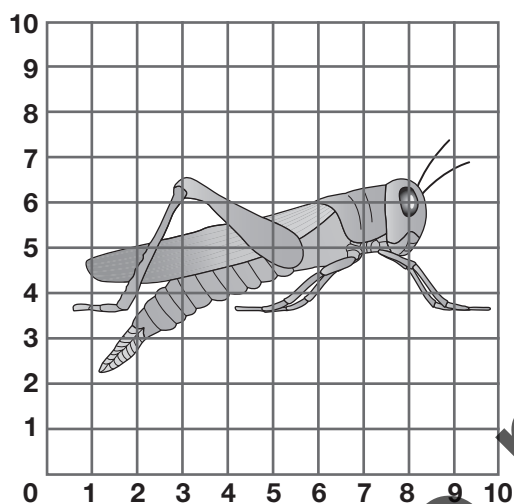
- 2 An incomplete diagram of a spider is shown below. **Use** its symmetry to complete the diagram. Shade your completed diagram so that it looks like a complete spider.



Working scientifically**N** Numeracy **CCT** Critical and creative thinking

Qualitative observations are descriptive. A qualitative observation might be recorded as a diagram or a written description. A diagram can often record your observations better than words. A grid allows you to scale the diagram up or down.

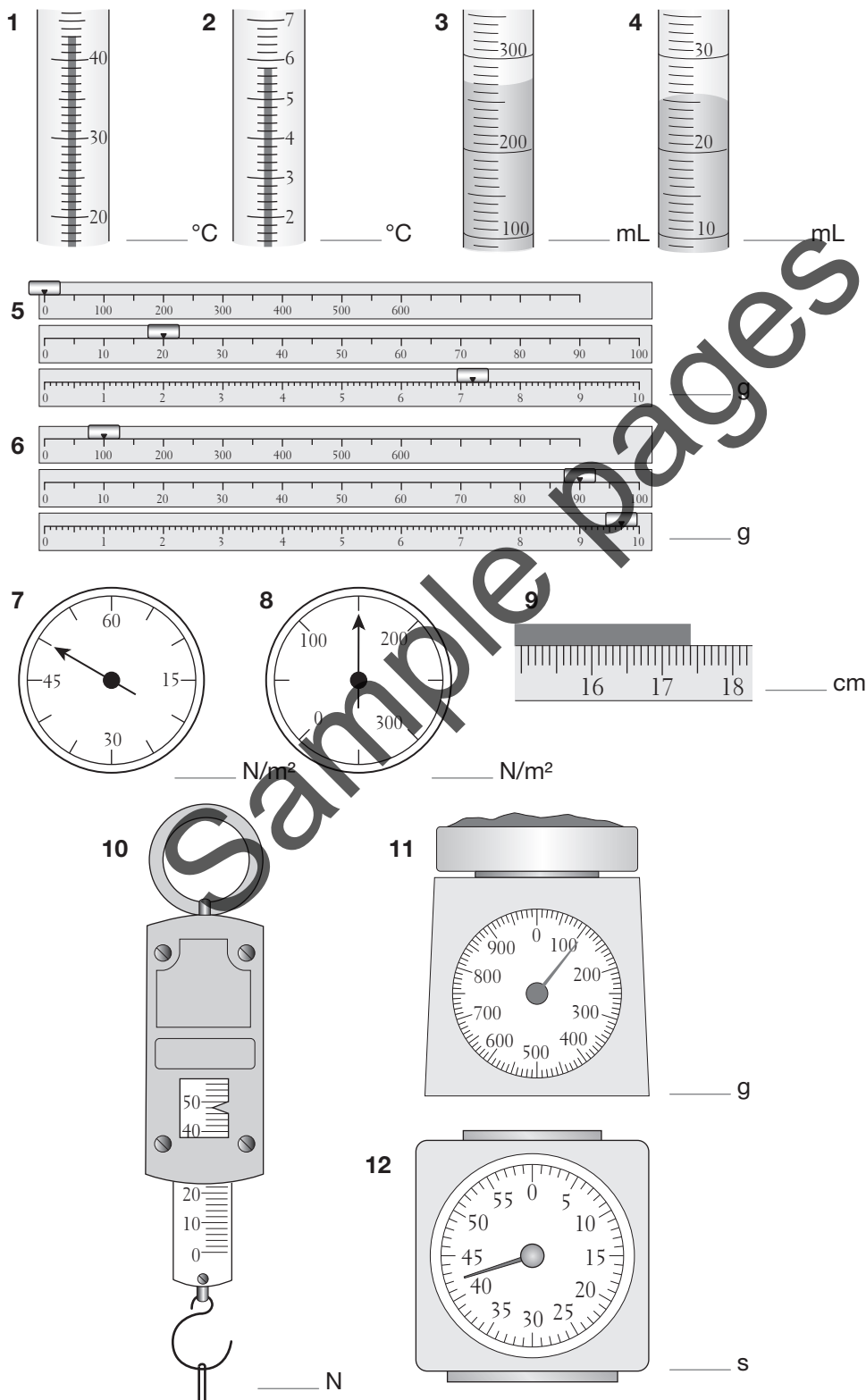
The sketch of an insect below needs to be made bigger. **Use** the larger grid to **construct** a scaled-up version of the diagram of the insect.



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N Numeracy**WE** Work and enterprise**CCT** Critical and creative thinking

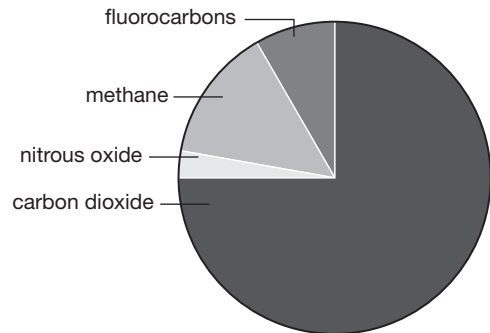
State what measurements each of these instruments is showing.



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This pie graph shows the different greenhouse gases in Earth's atmosphere.



- 1 From the list below, **identify** what fraction of greenhouse gases is carbon dioxide.

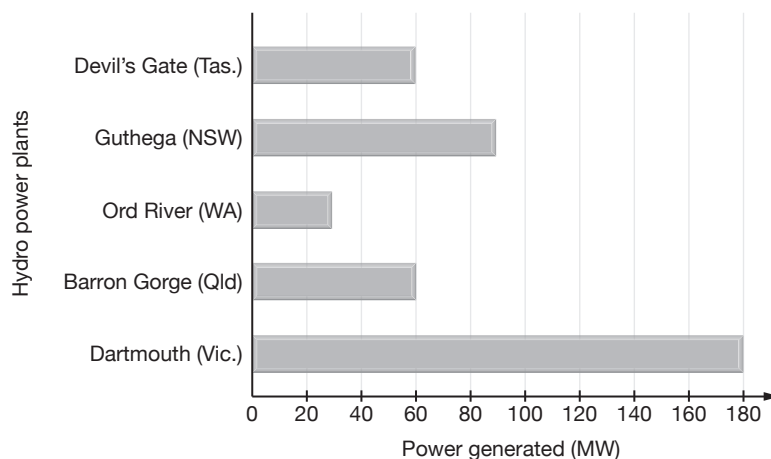
- A $\frac{1}{10}$
 B $\frac{1}{4}$
 C $\frac{1}{2}$
 D $\frac{3}{4}$

- 2 Methane is a far more powerful greenhouse gas than carbon dioxide. Despite this, very few scientists are as worried about methane as they are about carbon dioxide. **Use** the graph to **propose** reasons why.

- 3 **Use** the table below to **identify** the most likely percentages of greenhouse gases in the atmosphere. Choose A, B, C or D.

	Carbon dioxide	Methane	Nitrous oxide	Fluorocarbons	Total
A	50%	25%	13%	12%	100%
B	76%	6%	13%	5%	100%
C	76%	13%	3%	8%	100%
D	61%	13%	13%	13%	100%

This bar graph compares the amount of electricity generated by five Australian hydroelectric power plants.



4 **Name** the two plants that generate the same amount of power.

5 **Use** the following key to **specify** how much more power Dartmouth produces than:

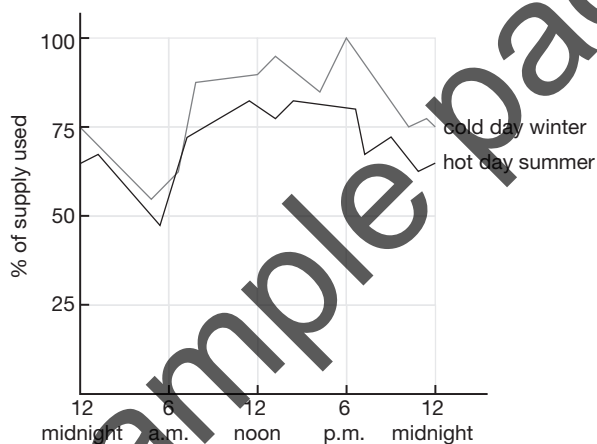
(a) Ord River _____

(b) Barron Gorge _____

(c) Guthega _____

- | | |
|----------|---------------------------|
| A | About twice as much |
| B | About three times as much |
| C | About four times as much |
| D | About six times as much |

The line graph below shows how much energy is used at different times of the day in Sydney in winter and summer.



6 (a) **State** the maximum percentage of supply used in Sydney. _____

(b) **Specify** the time and season at which it occurs. _____

7 (a) **State** the minimum percentage of supply used. _____

(b) **Specify** the time and season at which it occurs. _____

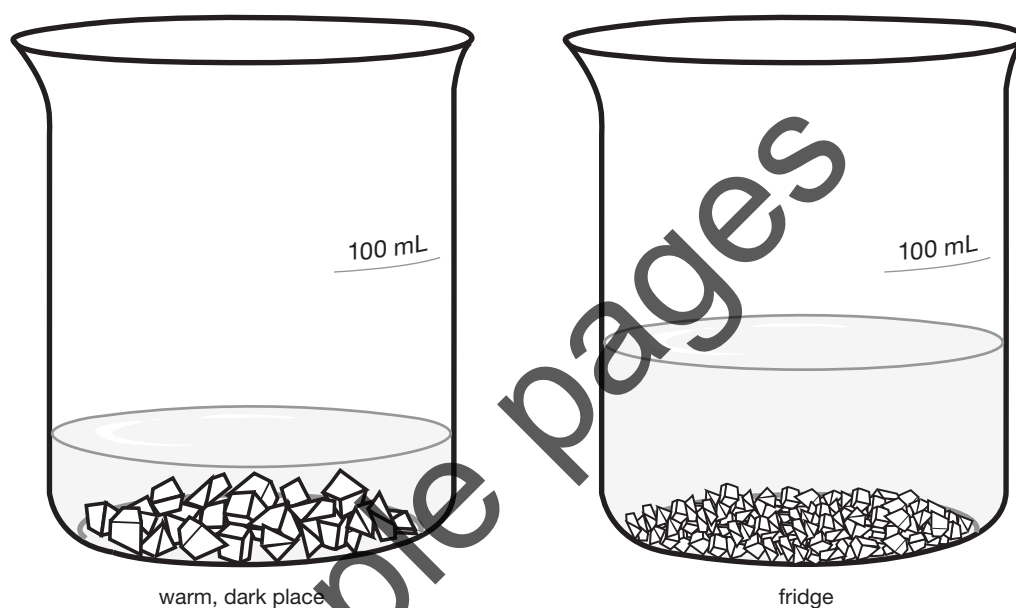
8 **Propose** reasons why these maximums and minimums would occur at those times and in those seasons.

9 **Compare** winter consumption with summer consumption.

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As part of her science project, Chloe wanted to find out how big salt crystals would grow under different conditions. She set up two large beakers and added 100 mL of water and 8 large spatulas of salt to both. She boiled both for 5 minutes on a hotplate. She then placed one beaker in the fridge and the other in a warm, dark place.

She left both beakers for a day and then sketched what she saw.



- 1 State** the purpose, or aim, of Chloe's experiment.

- 2 Identify** the independent variable in Chloe's experiment. This is the variable that Chloe changed.

- 3 Identify** the controlled variables in the experiment. These are the variables that Chloe controlled or kept the same.

- 4 **Explain** why Chloe used the same volume of water and the same amount of salt in both beakers.

- 5 **Use** the diagram to **list** her observations.

- 6 **Identify** the best conclusion for Chloe's experiment.

- A The experiment was fun and I learnt a lot.
- B Salt dissolves in water.
- C Salt forms crystals.
- D Cooler temperatures produced smaller crystals.

- 7 Chloe then wanted to test how the size of crystals depended on the amount of salt added. **Construct** a dot-point method that she should follow.

Knowledge and understanding

L Literacy

1 Use the following clues to **identify** the key terms from the chapter.

Clue	Word
The study of space	a _____
The study of living things	b _____
The study of chemicals	c _____
The study of the environment	e _____
The study of Earth	g _____
The study of energy and force	p _____
The study of behaviour	p _____
The place where scientists work	l _____
Poisonous	t _____
A special glass that most beakers are made of	p _____
An educated guess	h _____
A factor that may change the result of an experiment	v _____
Patterns in results	t _____
What you are trying to do	a _____
Heating device	h _____
Units used by scientists	m _____
Amount of liquid, measured in L or mL	v _____
Curved surface on a liquid	m _____
Turned to change the type of flame a Bunsen burner produces	c _____
Matter, measured in grams or kilograms	m _____

- 2 Once you have identified the key terms in question 1, **identify** and highlight them in the wordfind below.

Y	B	S	R	L	M	I	V	M	S	Y	B	Y	T	S
S	G	Y	U	E	C	A	T	I	H	R	C	G	R	G
P	Z	O	T	C	R	Q	S	E	Y	O	H	O	E	I
C	H	R	L	I	S	E	X	G	B	T	E	L	N	X
A	I	Y	A	O	H	I	O	R	X	A	M	O	D	E
C	I	B	S	T	H	L	N	E	H	R	I	I	S	G
A	L	M	O	I	O	C	R	E	H	O	S	B	U	L
E	P	P	I	C	C	Y	Y	R	M	B	T	Q	J	R
C	Y	R	E	Q	P	S	Z	S	A	A	R	C	W	G
H	E	T	A	L	P	T	O	H	P	L	Y	I	D	V
L	A	S	T	R	O	N	O	M	Y	P	L	X	M	H
M	A	S	S	C	Y	T	S	E	M	U	L	O	V	G
K	U	O	C	T	H	L	N	Q	P	F	J	T	C	T
J	R	W	U	T	G	J	D	Q	Z	D	B	I	W	V
B	G	J	S	G	E	O	L	O	G	Y	Q	E	B	M