NMSSA Science Toolkit - Assessment 2

This is an assessment of your learning in science.

In this test there are four different types of questions for you to answer. You might need to:

1. **Click on one or more answers to select them.**
2. **Choose a word from a drop down menu to complete a sentence.**
3. **Draw and/or label diagrams.**
4. **Write a response to a question.**

When you have answered a question click on the Next button 

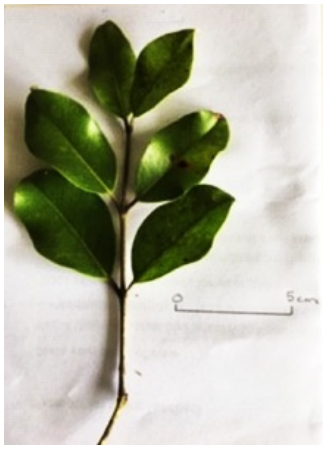
. To go back to a question you have already attempted click on the grey back arrow button. 

You may need to scroll down the page to read all the information.
There are **36** questions in this test. It should take you about 45 minutes to complete. Try to answer all the questions.

Native leaves

Table of some New Zealand native trees

Name of native tree	Leaf shape	Edge of leaf	Arrangement of leaves on stem	Approximate size of leaf
kōwhai	round	smooth	 opposite	1 cm
mānuka	oval	smooth	 alternate	1 cm
rātā	oval	smooth	 alternate	3-6 cm
pōhutukawa	oval	smooth	 opposite	3-10 cm



1) Use the table to identify the leaf in the photo above.

- kōwhai
- mānuka
- rātā
- pōhutukawa

Table of some New Zealand native trees

Name of native tree	Leaf shape	Edge of leaf	Arrangement of leaves on stem	Approximate size of leaf
kōwhai	round	smooth	opposite	1 cm
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rātā	oval	smooth	alternate	3-6 cm
pōhutukawa	oval	smooth	opposite	3-10 cm

2) Which of these claims can be justified (supported by) using only the data in the table? Choose **two.**

- Mānuka and kōwhai leaves are smaller than rātā leaves.
- All NZ native trees have leaves with smooth edges.
- Not all NZ native trees have the same shaped leaves.
- Pōhutukawa and rātā both have alternating leaves.

Energy bulbs 2

Energy usage table

Incandescent bulb	 KMJ | CC-BY SA 3.0	1600	100 watts
CFL bulb	 © Sun Ladder | CC-BY-SA 3.0	1600	25 watts
LED bulb	 Dinkar.shukla | CC-BY SA 4.0	1600	20 watt

All the light bulbs above lose energy as heat. The more heat they lose, the more electricity they need to make the same amount of light.

3) Which light bulb loses the **most** heat energy?

- The incandescent light bulb.
- The CFL light bulb.
- The LED light bulb.
- They are all losing the same heat energy.

Energy usage table

Incandescent bulb	 KMJ | CC-BY SA 3.0	1600	100 watts
CFL bulb	 Sun Ladder | CC-BY-SA 3.0	1600	25 watts
LED bulb	 Dinkar.shukla | CC-BY SA 4.0	1600	20 watts

Energy can change from one form to another.

4) What energy changes are correct for the LED bulb?

- electricity to heat
- electricity to light
- electricity to light and heat
- electricity to electricity

Static electricity
Read the information below then click on the Next button to answer some questions.

Students in room 6 were investigating static electricity. They rubbed a balloon on different materials and held it above their hair. When their hair stood up, their teacher said they had made static electricity. Here are the results of their investigation.


© MikeRun | Wikipedia, CC-BY SA 4.0

Room 6 investigation
Materials tested for static electricity

cotton	N	N	N	Y	N
rayon	N	N	N	Y	Y
polyester	Y	Y	Y	Y	Y
wool	Y	Y	Y	Y	Y
silk	Y	Y	Y	Y	Y

Key:

Y	Hair stood up	Static electricity was made
N	Hair did not stand up	Static electricity was not made

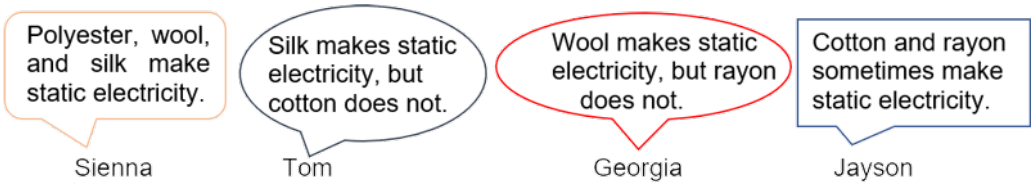
Room 6 investigation
Materials tested for static electricity

cotton	N	N	N	Y	N
rayon	N	N	N	Y	Y
polyester	Y	Y	Y	Y	Y
wool	Y	Y	Y	Y	Y
silk	Y	Y	Y	Y	Y

Key:

Y	Hair stood up	Static electricity was made
N	Hair did not stand up	Static electricity was not made

Some of the students discussed the class results.



5) Whose statement can you be **most sure** is correct?

- Sienna's
- Tom's
- Georgia's
- Jayson's

Room 6 investigation
Materials tested for static electricity

cotton	N	N	N	Y	N
rayon	N	N	N	Y	Y
polyester	Y	Y	Y	Y	Y
wool	Y	Y	Y	Y	Y
silk	Y	Y	Y	Y	Y

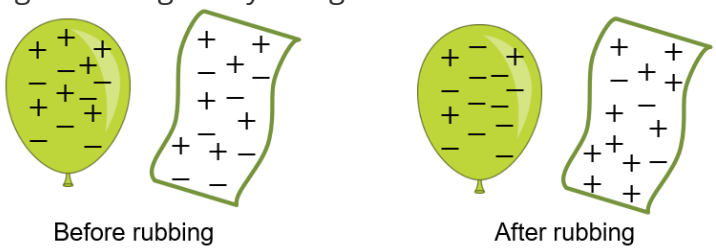
Key:

Y	Hair stood up	Static electricity was made
N	Hair did not stand up	Static electricity was not made

Two groups found that rayon **did** make static electricity.
Georgia's group found that rayon **did not** make static electricity.

6) What could the class do to find out which result was correct?

The teacher said the balloon had been given a charge from the material. A charge can be positive + or negative - .
If an item has more positive charges it is positively charged.
If it has more negative charges it is negatively charged.



In the before rubbing diagram the charges are the same so neither the balloon nor the material is charged.

7) After the balloon has been rubbed onto the material, what sort of charge do they each have?

- The balloon is positively charged, and the material is negatively charged.
- The balloon is negatively charged, and the material is positively charged.
- The balloon and the material are both positively charged.
- The material and balloon are both neutral (no charge).

When things have different charges, they **move towards** each other.
When things have the same charge, they **move away** from each other.

8) The student's hair stood up because

- the balloon had a different charge to the student's hair.
- the balloon had the same charge as the student's hair.
- the balloon and the student's hair were not charged.

Kea and kākā

Living things change over time. This helps them survive when the conditions of the places they live in change.
Kea and kākā look similar. Scientists think that a long time ago they had the same ancestor.

Kea

© J.Fisher | PhotoKete

- found in forests and mountains of the South Island of New Zealand
- mostly olive-green with a brilliant orange under their wings
- nest in burrows or crevices among the roots of trees
- eat dead animals, roots, leaves, berries, nectar, and insects.

Kākā

© Rosino | Flickr, CC-BY 2.0

- found in lowland native forest throughout New Zealand
- strongly patterned brown/green/grey feathers with orange and scarlet flashes under the wings
- make their nests in hollow trees
- eat fruits, berries, seeds, flowers, buds, nectar, sap, plants, and insects.

Use the information in the fact file and in the introduction to answer the following question.

9) Which statement **best** supports why scientists think that the kea and the kākā have the same ancestor?

- Their names are similar.
- They have many similar features.
- They live in New Zealand forests.
- They eat the same types of food.

Kea

- found in forests and mountains of the South Island of New Zealand
- mostly olive-green with a brilliant orange under their wings
- nest in burrows or crevices among the roots of trees
- eat dead animals, roots, leaves, berries, nectar, and insects.

Kākā

- found in lowland native forest throughout New Zealand
- strongly patterned brown/green/grey feathers with orange and scarlet flashes under the wings
- make their nests in hollow trees
- eat fruits, berries, seeds, flowers, buds, nectar, sap, plants, and insects.

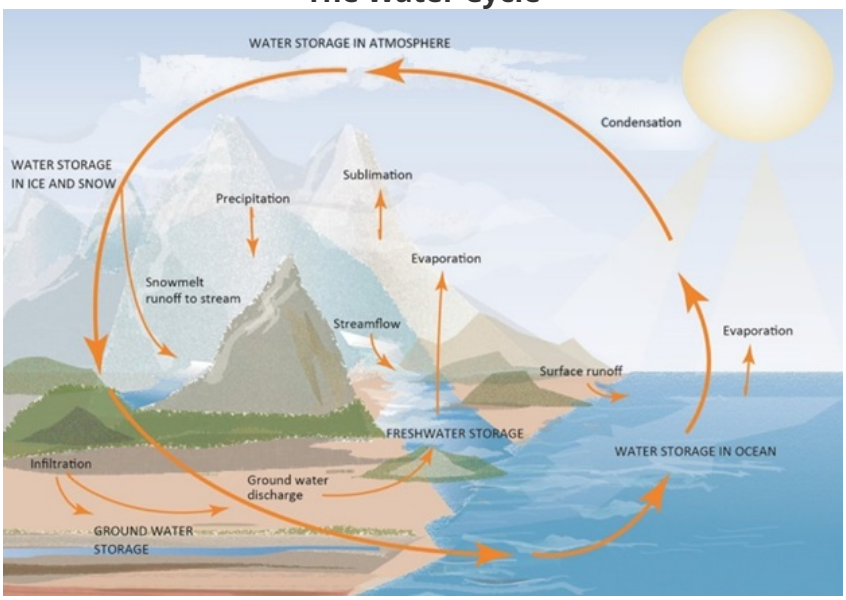
Use the information in the fact file to answer the following question:

10) Which statement **best** explains why both the kea and kākā changed over time?

○ The kea changed to survive in cold mountain climates.	○ The kākā changed to survive in lowland forests.
○ The kea and kākā changed to survive in different climates.	○ The kea and kākā changed because they live in New Zealand forests.

Water cycle system

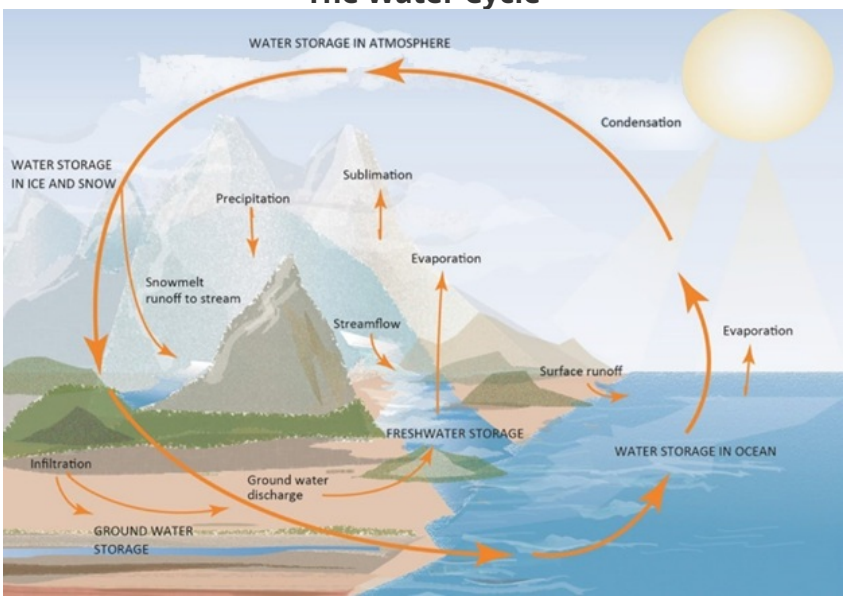
The Water Cycle



Use the diagram to answer the following question:

11) Name 5 places water is stored.

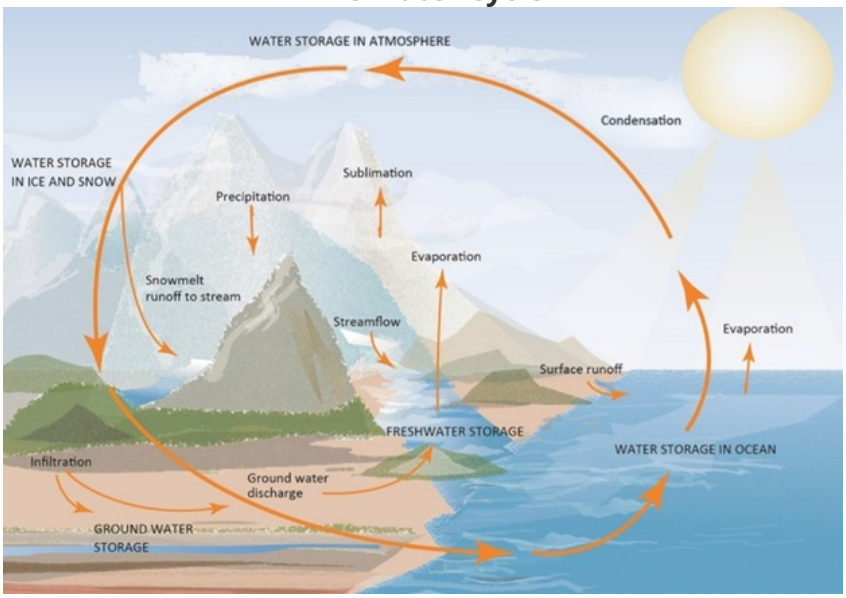
The Water Cycle



Use the diagram to answer the following question:

12) When water particles move from the sea to the air what is the process called?

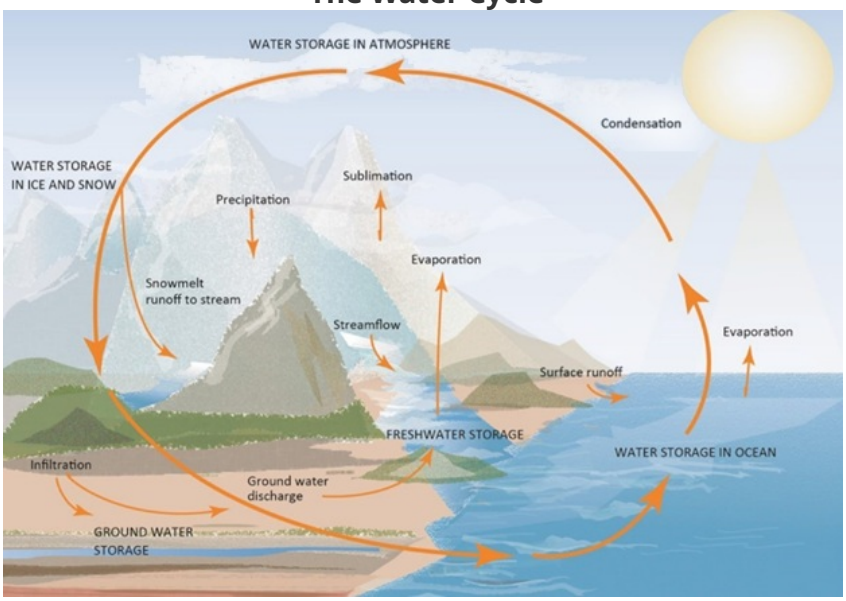
The Water Cycle



Use the diagram to answer the following question:

13) When water soaks into the ground what is the process called?

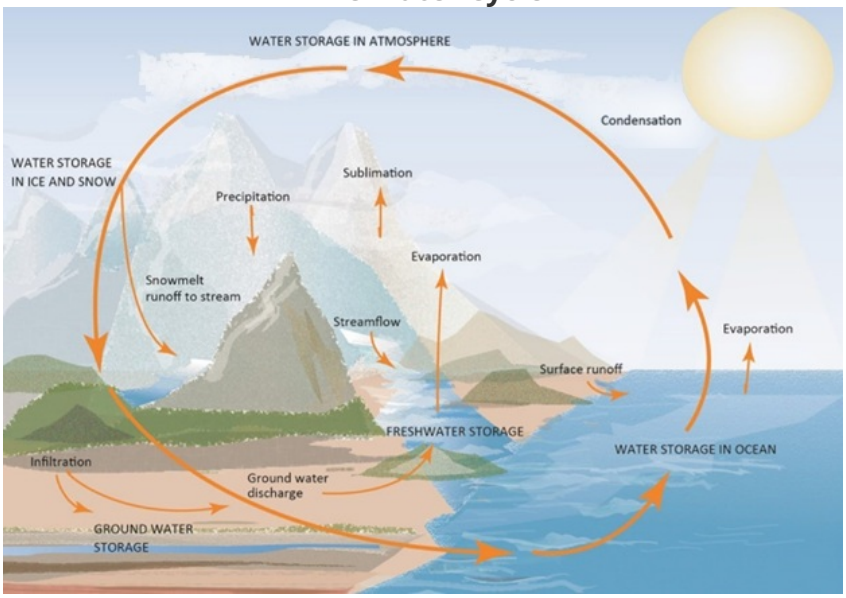
The Water Cycle



Use the diagram to answer the following question:

14) When ice turns into water vapour what is the process called?

The Water Cycle



Use the diagram to answer the following question:

15) What do the arrows show?

1080

The Department of Conservation (DOC) sometimes uses a poison called 1080 to kill pests such as mice, rats, and possums.

16) Do you think this is a good thing for DOC to do?

- Yes
- No

17) Give **two** reasons that support your opinion.

Running

Source: Dreamstime

18) When I run fast, I notice that first my breathing gets faster and then my heart beats faster too. This is because:

- running is good for you and keeps you fit and healthy.
- the lungs and heart both work to get more oxygen to your muscles.
- the heart's job is to pump blood around the body.
- when you run, you breathe through your mouth instead of your nose.

19) Which of the questions below could be answered by doing an investigation? Choose **all** that apply.

- What effect does exercise have on your heart rate?
- Why do we have two lungs and one heart?
- What is the most common season for catching a cold?
- Do grazes heal faster with or without plasters?

Predators

A New Zealand food chain

leaves → **giant wētā** → **morepork** → **rat**

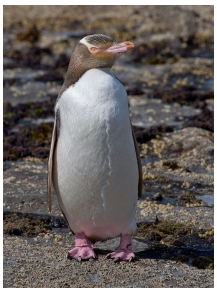
20) What does the food chain above tell you about moreporks?

- Moreporks eat rats.
- Giant wētā eat moreporks.
- Moreporks eat leaves.
- Rats eat moreporks.

Yesterday Sarah watched her cat catching and eating a blackbird. The blackbird was busy eating a snail that it had picked off a cabbage. The cabbage leaves were full of holes where the snail had been feeding.

21) Draw a food chain to show what Sarah saw.

Fact file on Hoiho



© Christian Mehlführer | CC-BY 2.5

- Hoiho (yellow-eyed penguins) are endangered.
- They build their nests on land and catch their food in the ocean.
- Predators attack them at sea and on land.

Some predators of hoiho

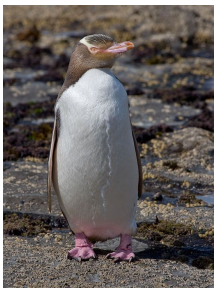
Natural predators	Introduced predators
barracudas, sharks, seals, sea lions	cats, stoats, dogs, ferrets

Use the fact file on hoiho and the table of predators to answer the question below.

22) What can introduced predators do that natural predators cannot?

- Eat plants that hoiho eat.
- Eat the chicks and eggs in the nest.
- Eat the adults when they are hunting for food.
- Eat the food the adults catch for their chicks.

Fact file on Hoiho



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Some predators of hoiho

Natural predators	Introduced predators
barracudas, sharks, seals, sea lions	cats, stoats, dogs, ferrets

Use the fact file on hoiho and the table of predators to answer the question below.

23) What is the most important information from the table when deciding on **practical actions** to take to protect hoiho?

- The natural predators are bigger than introduced predators.
- The introduced predators all live on land.
- The natural predators are more dangerous.
- The introduced and natural predators both eat penguins.

Letting the light through

A class was investigating which things let light through. They held different objects up to a torch. The table shows the results of all 6 groups in the class.

Glass of water	/ / / / / /		
Glass of orange juice	/ / /	/ / /	
Leaf	/	/ /	/ / /
Feather	/	/ / / / /	
A piece of plastic	/ / /		/ / /
A towel		/ /	/ / / /
A tissue		/ / / / / /	
A piece of cardboard		/	/ / / / /

24) Which statement is **best** supported by the results?

- A tissue is translucent.
- A leaf is opaque.
- Plastic is transparent.
- A glass of orange juice is transparent.

Glass of water	/ / / / /	/	
Glass of orange juice	/ / /	/ / /	
Leaf	/	/ /	/ / /
Feather	/	/ / / / /	
A piece of plastic	/ / /		/ / /
A towel		/ /	/ / / /
A tissue		/ / / / / /	
A piece of cardboard		/	/ / / / /

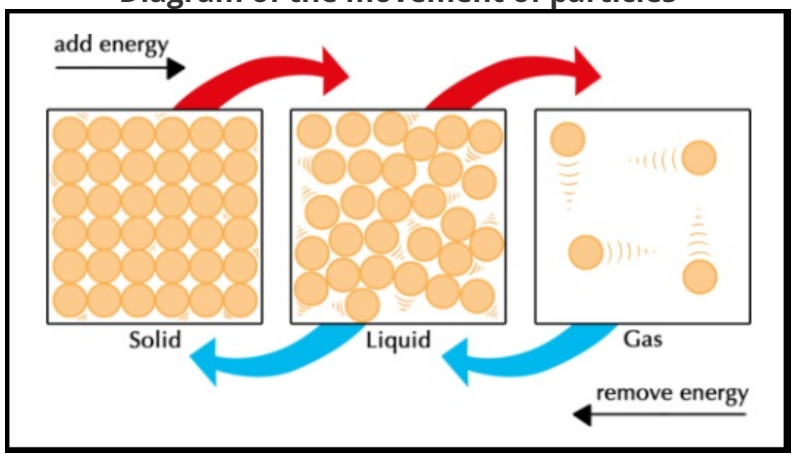
25) What might have caused different groups to get different results? Choose **all** that apply.

- Different groups measured the light getting through in different ways.
- Some groups had brighter torches than others.
- The objects tested by each group were not exactly the same.
- The groups did not test all the objects for the same amount of time.

Water particles

Everything is made up of particles. Particles are so small that we can't see them. Scientists use diagrams to explain how particles move when water changes from a solid to a liquid to a gas.

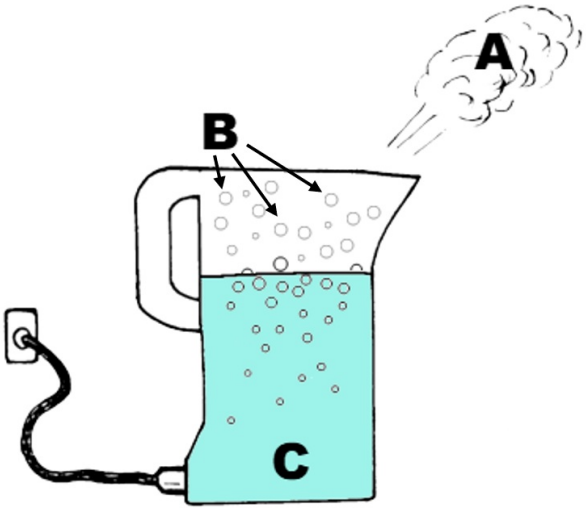
Diagram of the movement of particles



In the diagram, the  symbols are used to show how fast the particles are moving.

26) Which of the following statements describes what is happening to the particles when liquid changes to a gas?

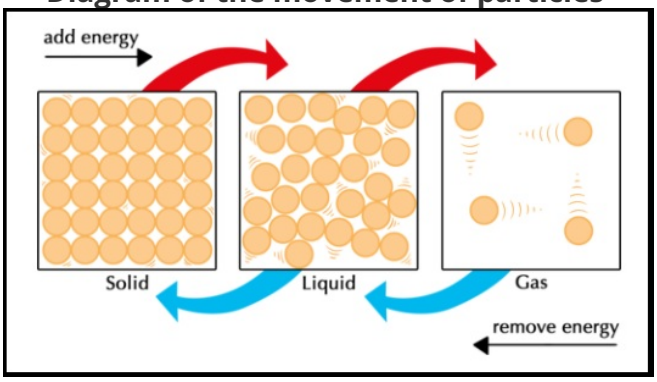
- The particles move faster.
- The particles move at the same speed.
- The particles slow down.



27) Look carefully at the diagram above. A, B and C all show forms of water.
Select the word that describes the form of the water for each letter.
Some words may be used more than once.

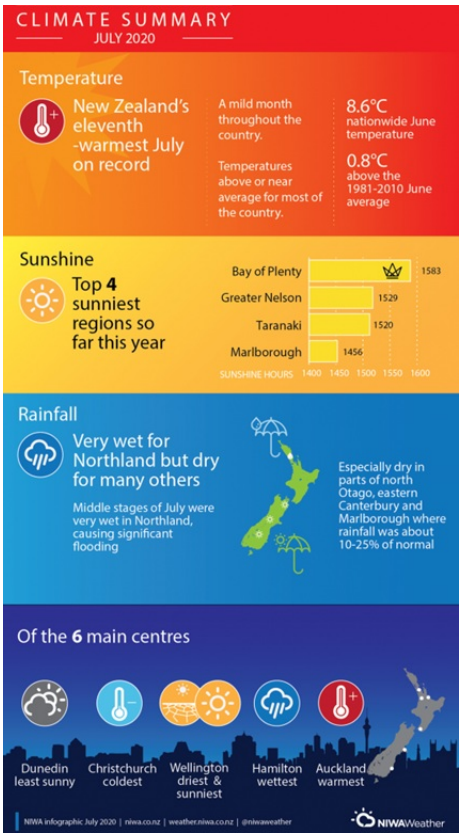
A. *solid| liquid| gas* B. *solid| liquid| gas* C. *solid| liquid| gas*

Diagram of the movement of particles



28) Explain what happens to water particles when water changes to a gas. Write so that a six-year-old child could understand your explanation.

Climate summary



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July 2020 Climate Statistics (Main Centres only)

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland	11.6	+0.7	Above average
Tauranga	10.9	+0.6	Above average
Hamilton	9.3	+0.6	Above average
Wellington	9.6	+0.7	Above average
Christchurch	6.4	+0.6	Above average
Dunedin	7.2	+0.7	Above average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland	94	69	Below normal
Tauranga	85	66	Below normal
Hamilton	106	82	Near normal
Wellington	59	43	Well below normal
Christchurch	67	103	Near normal
Dunedin	70	123	Above normal
Sunshine			
Location	Sunshine (hours)		
Auckland	116		
Tauranga	118		
Hamilton	116		
Wellington	148		
Christchurch	119[2]		
Dunedin	114		

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29) Use the diagram **and** the table to decide which one of the statements below is **definitely true**.

- In July 2020 Hamilton had the highest rainfall in New Zealand.
- July 2020 was the warmest July ever in New Zealand.
- In July 2020 Wellington had less rain than it usually gets in July.
- In July 2020 it was sunnier in New Zealand than usual for July.

Climate summary

>

30) Whose idea fits the evidence **the best**?

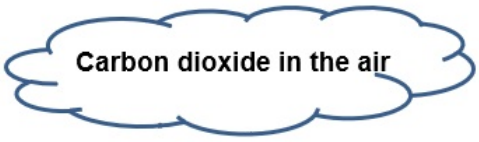
- This July Climate Survey shows that New Zealand's climate is heating up. — Amy
- I don't agree with Amy because there was lots of rain in some places. — Aroha
- I don't think we can tell by looking at just one month. — Leah
- I think Amy is right because the temperature was 0.8 degrees above the June — Hani

Carbon cycle

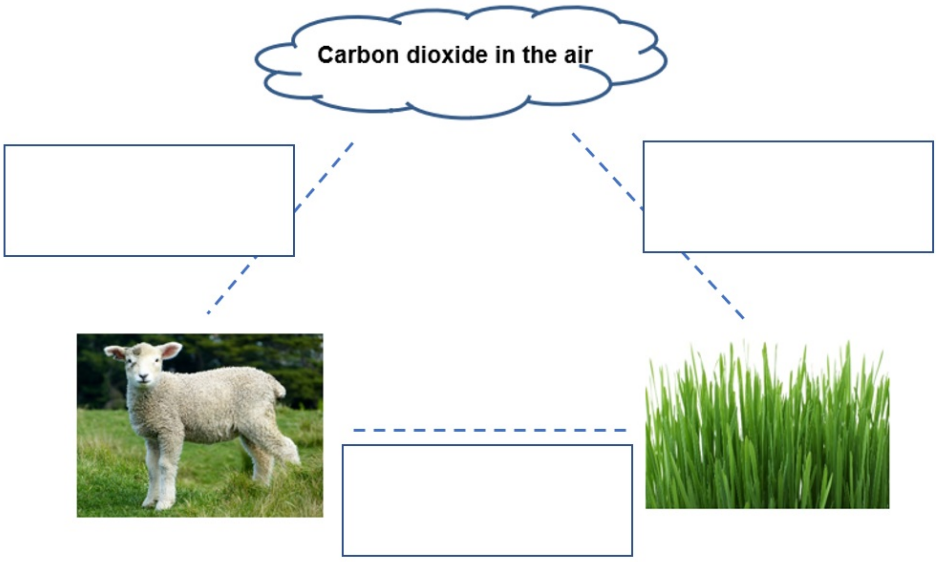
All living things have carbon in them - Plants take carbon dioxide out of the air to make food - Animals get carbon from plants and breathe out carbon dioxide - Carbon dioxide can be produced when things are burned.

In the diagram below,

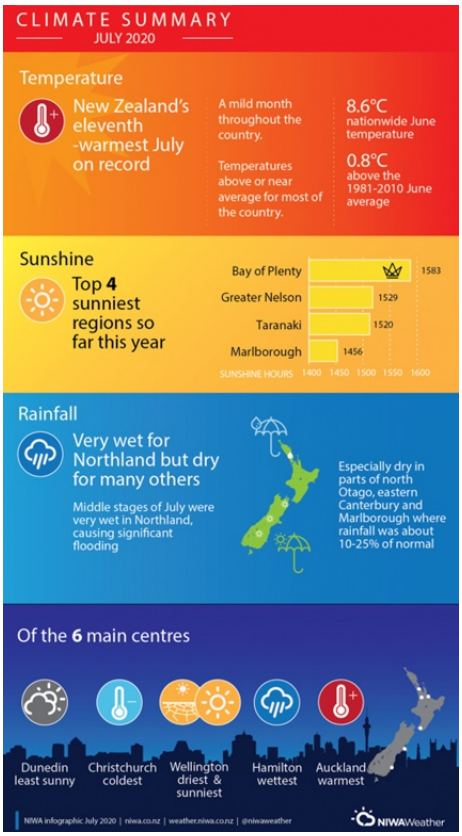
31) draw arrows to show how carbon moves from the air into plants and animals then back into the air.



32) Label the dotted lines to show what is happening.



33) Forest fires cause levels of carbon dioxide in the air to increase in two ways.
What are the **two** ways?



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Sunshine			
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Wellington	148		
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1.

2.

Birdsong

Scientists have done different studies about the songs of city and country birds. They have observed that birds of the same species sing differently if they live in the city or in the country. Here is what they found out.

- sing their songs more loudly than country birds
- sing their songs more quietly than city birds
- sing longer songs than country birds
- sing shorter songs than city birds
- sing their songs faster than country birds
- sing their songs more slowly than city birds

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In one study scientists observed that city birds sang more quickly and for a longer time than country birds.

34) What would scientists have been observing to make them think this? Choose **two**.

- ○ How loudly city and country birds sing.
- ○ The length of time city and country birds sing.
- ○ The different songs city and country birds sing.
- ○ How quickly city and country birds sing.

- sing their songs more loudly than country birds
- sing their songs more quietly than city birds
- sing longer songs than country birds
- sing shorter songs than city birds
- sing their songs faster than country birds
- sing their songs more slowly than city birds

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Singing slowly makes a lower sound that carries better over city noise.
Because of this, some scientists thought that city birds would sing more slowly than country birds.

35) Which observation shows their idea is wrong?

- ○ City birds sing their songs more loudly than country birds.
- ○ City birds sing their songs faster than country birds.
- ○ Country birds sing shorter songs than city birds.
- ○ Country birds sing their songs more quietly than city birds.

Shadows

The netball goal post at school is **2** metres high. We measured the length of its shadow at 3 different times during the day, at 4 different times during the year.

	Length of Shadow		
1 February	2.0m	1.0m	2.0m
1 May	4.6m	2.8m	4.6m
1 August	20.0m	7.2m	20.0m
1 November	3.4m	2.2m	3.4m

36) Which of these statements are supported by the data? (Choose **all** that apply.)

- Shadows are longer in the morning than in the afternoon.
- Shadows are longer in winter than in summer.
- Shadows are shorter at midday than in the morning.
- Shadows are always longer than the object that is blocking the light.
- When the sun is high in the sky, the shadows are shorter.
- The length of a shadow changes during a day.

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