

Objectives:

Biology

Structure and function

- Describe the human circulatory system in terms of the heart pumping blood through arteries, capillaries and veins, describe its function (limited to transporting oxygen, nutrients and waste), and know that many vertebrates have a similar circulatory system.
- Describe the human respiratory system in terms of oxygen from the air moving into the blood in the lungs. Know that many vertebrates have a similar respiratory system.
- Name the parts of the human reproductive system.

Life processes

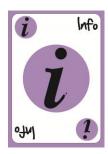
- Describe the physical changes that take place during puberty in humans.
- Know that some diseases can be caused by infection with viruses, bacteria, parasites, or fungi that can be passed from one host to another.
- Describe how good hygiene can control the spread of diseases transmitted in water, food, and body fluids, and describe ways to avoid being bitten by insect vectors.
- Know that humans have defense mechanisms against infectious diseases, including skin, stomach acid and mucus.

Ecosystems

2

- Interpret food webs and identify food chains within them.
- Know that some substances can be toxic and damage living things, and that these substances can move through a food chain/web.
- Identify the energy source of a food chain/web and describe how energy is transferred through a food chain/web.

Circulatory and respiratory system

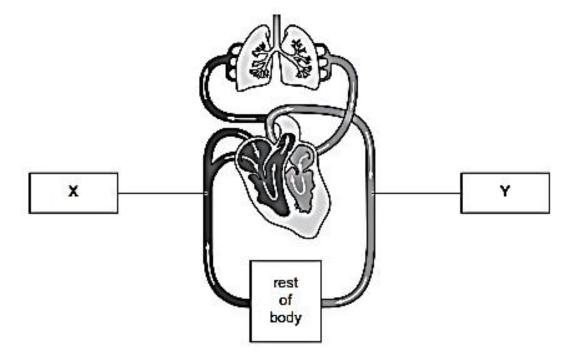


Q1)

Elephants have a similar circulatory system to humans.

(a)	Write down the names of the three types of blood vessels in an elephant.
	1
	2
	3
(b)	Write down the function of the heart.
(c)	One of the functions of the blood in an elephant is to transport the gas carbon dioxide.
	Write down two other substances the blood transports.
	1
	2

Q2)



The diagram shows parts of the circulatory system.

- a) Name the types of blood vessels labeled X and Y in the diagram
 X.....
 Y.....
- (b)Name what type of blood that moves in X and Y.

 X.....
 Y.....

Q3) Priya investigates pulse rate and exercise.

Pulse rate is the number of times the heart beats in a minute.

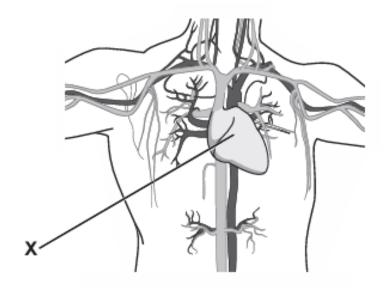
Priya:

- step 1 measures her normal (resting) pulse rate
- step 2 runs 100 m as fast as possible
- step 3 immediately measures her pulse rate
- step 4 rests until her pulse rate goes back to normal
- step 5 repeats steps 1 to 4
- . step 6 repeats the investigation with some of her friends
- step 7 looks at her results to make a conclusion.

(a)	Priya makes a prediction for her investigation.
	Suggest a possible prediction for this investigation.
(b)	Which step involves fair testing?
(c)	Which step involves pattern seeking?
(d)	Which step improves the reliability of the data collected by Priya?
(-,	Trinor ctop improved the reliability of the data delicence by 1 mya.
(e)	Fair testing and pattern seeking are two types of scientific enquiry.
	Describe two other types of scientific enquiry.
	1
	2
(f)	Blood moves around the body through blood vessels.
	Capillaries are one type of blood vessel.
	Write down one other type of blood vessel.

Q4)

The diagram shows part of the circulatory system.



(a) Name the organ labelled X.

(b) Describe the function of the organ labelled X.

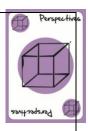
(c) Write down the name of two types of blood vessel shown in the diagram.

(d) A scientist measures the percentage of oxygen in the blood travelling through different blood vessels.

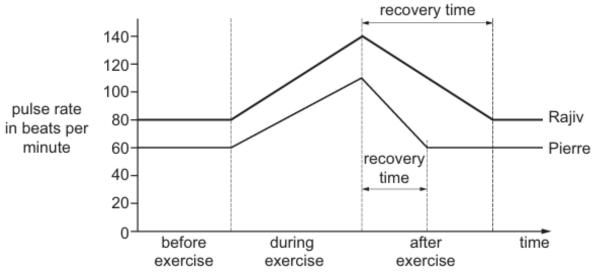
The table shows the results.

blood vessel	percentage (%) of oxygen
Α	99
В	79
С	83
D	75
E	92

	The blood vessels are found in different parts of the body.
	Which blood vessel transports blood from the lungs to the heart?
	Explain your answer.
Q5)
Ra	iv and Pierre measure their pulse rate before, during and after exercise.
(a)	Before Rajiv and Pierre start exercising they consider the risks.
	One risk is falling over when running, causing an injury to their ankles.
	This risk is reduced by wearing running shoes.
	Write down one other risk and how to reduce this risk.
	risk
	how to reduce this risk



(b) They present their results using a graph.



Write down **one similarity** and **one difference** in the pulse rates of Rajiv and Pierre.

imilarity	
ifference	

(c) Rajiv and Pierre also measure their breathing rate.

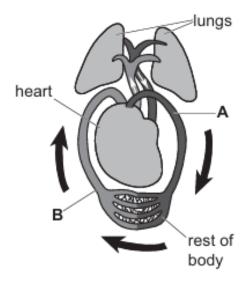
What happens to breathing rate during exercise?

Complete the sentence.

The breathing rate	during exercise because

Q6)

The diagram shows a model of the human circulatory system.



The arrows show the direction of blood flow.

(a) Complete the sentences.

Choose from the list.

	an artery	a capillary		a circulation
	a system		a vein	
	Blood vessel B is			
(b)	Blood transports oxygen and Name one other thing transp			

Q	7	١
~	•	

Inhaled air is the air we breathe in.

Exhaled air is the air we breathe out.

The table shows how inhaled and exhaled air are different.

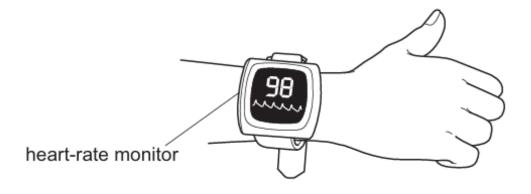
gas	inhaled air	exhaled air
carbon dioxide	0.04%	4%
oxygen	21%	16%
water vapour	0.5%	5%

(a)	Complete these sentences about exhaled air.	
	The percentage of carbon dioxide in exhaled air is than in inhaled air.	
	The percentage of water vapour in exhaled air is than in inhaled air.	
(b)	Explain why the percentage of oxygen in exhaled air	is less than in inhaled air

Q8)

Blessy wants to find out how exercise changes her heart rate.

She uses this equipment.



(a) What does the reading of 98 mean?

Circle the correct answer.

98 heart beats in one day

98 heart beats in one hour

98 heart beats in one minute

98 heart beats in one month

98 heart beats in one second



(b) Blessy writes a sentence in her book.

I need to measure the heart rate for the same length of time.

Which one of the following describes this sentence?

Circle the correct answer.

a conclusion

a fair test

a prediction

a result

a question

(c) Blessy does an experiment.

She then writes this sentence in her book.

The more exercise I do the higher the heart rate.

Which one of the following describes this sentence?

Circle the correct answer.

a conclusion

a fair test

a method

a prediction

a question

Q9)	Carlos investigates how different types of exercise affects his breathing rate
	Carlos:

- · counts how many times he breathes in for one minute before exercising
- exercises by walking around the room for one minute
- · counts how many times he breathes in for one minute
- rests for five minutes.

Carlos repeats his method two more times but changes the type of exercise each time.

(a)	What is the independent variable in this investigation?
(b)	Explain why Carlos rests between each type of exercise.

(c) Here are his results.

type of exercise	number of times Carlos breathes in for one minute
before exercise	25
walking	28
running	45
jumping	52

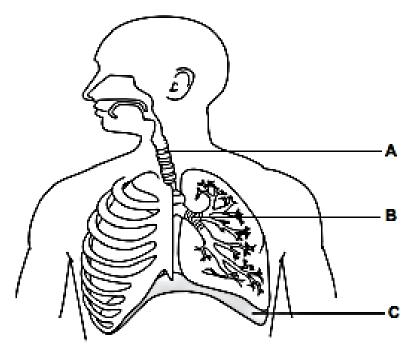
Complete the sentence about the results

Carlos	hreathes	faster when	he	evercises
Callus	Dieanles	iasiei wiieii	1165	exercises.

He does this to get more int	nto his body.
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Q10)

The diagram shows part of the human respiratory system.



Name the structures labelled A, B and C.

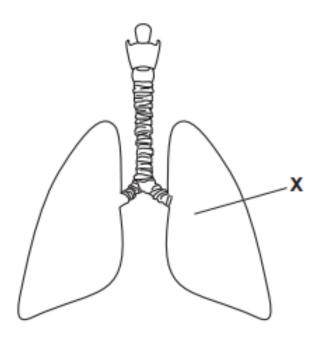
Choose words from the list.

	air sac	bronchus	diaphragm	lung	rib cage	trachea
A						
В						
C						

Q11)

Look at the diagram.

(a) Write down the name of organ X



\ /	 	 	

(b) Write down the function of organ X and explain how this function keeps us alive.

Turrettori		 •••••	 	• • • • • • • • • • • • • • • • • • • •
explanat	tion			

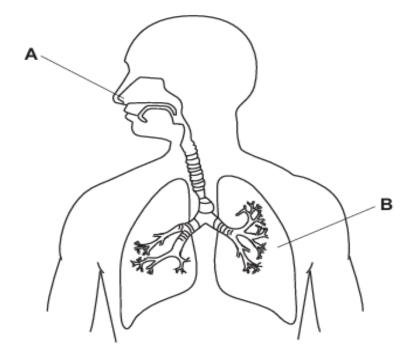
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Teacher: Nada Marji

function

Q12)

Look at the diagram of the human respiratory system.



(a) Write down the name of part A of the human respiratory system.

(b) Write down the name of part B of the human respiratory system.

(c) Describe the function of the human respiratory system.

Reproduction system

Q13)	Increase in height is one physical change that happens to females during puberty.
	Describe two other physical changes that happen to females during puberty.
	1
	2

Q14) Write the physical change that takes place in male and female part by using the comparing and contrasting mind map.



Physical changes in male and female bodies

Q15)
Physical changes take place during puberty in humans.
(a) Describe one physical change that only takes place in females.
(b) Describe one physical change that only takes place in males.
(c) Describe one physical change that takes place in both males and females.

Diseases

Q16)	
Sc	ome diseases are caused by infection with different organisms.
(a) Influenza (flu) is caused by a virus.
	Complete the sentences.
	The influenza virus is passed from the first host to a second host.
	The virus travels in the air when the first host
	The second host knows they have the virus because they feel
	To stop themselves getting infected by the flu virus, the person
	isoning is an illness.
Food po	isoning may be caused by eating food containing bacteria.
It is impo	ortant to reduce the spread of bacteria.
Keeping bacteria	uncooked food and cooked food separate reduces the spread of
Describe	e two other ways to reduce the spread of bacteria.
1	
2	Brainstown

Q17)

This question is about human diseases.

Look at the table that shows information about some human diseases.

disease	cause of infection	how infection enters the body
cholera	bacteria	unsafe water and food
malaria	parasite	insect bite
Zika	virus	insect bite
tetanus	bacteria	through cuts in the skin
yellow fever	virus	insect bite

(a)	Bacteria, parasites and viruses all cause disease in humans.
	Write down one other type of living thing that causes disease in humans.
	Write down one disease from the table that is controlled by using good hygiene.
(c)	Describe two ways to reduce infection with malaria.
	2

Q18)

Priya and Rajiv are visiting this rainforest.



Priya and Rajiv are worried they may be bitten by an insect and get an infection.

(a)	Describe two ways Priya and Rajiv can avoid being bitten by insects in the rainforest.
	1
	3
	,
(b)	Some diseases are caused by infection of bacteria.
	Write down the name of two other types of organisms that may cause a disease by infection.
	1
	2

Q19)	Disease may be spread by swallowing food or water that contains harmful organisms such as bacteria.				
	(a) Write down the name of one other type of organism that spreads disease.				
	(b) Describe two ways good hygiene controls the spread of diseases carried in food and water.				
	2				
Q20)	Some fungi cause diseases in the body.				
	(a) Name one other type of living thing that causes diseases in the body.				
	(b) Mucus is a defence mechanism against infectious diseases. Which argan system of the body contains mucus?				
	Which organ system of the body contains mucus?				

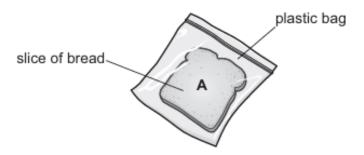
Q21) Priya investigates the spread of mould.

Mould is a type of fungus.

Priya:

- · puts one slice of bread into four different plastic bags
- · prepares each slice of bread differently
- seals each bag closed
- · leaves the slices of bread for three days.

The diagram shows one of the slices of bread at the start of the investigation.



After three days Priya records the amount of mould on each slice of bread.

Look at the table.

slice of	how slice of bread is	observation after
bread	prepared	three days
A touched by hands inside gloves B touched by hands washed in soap and water C touched by hands that have not been washed		small amount of mould
		no mould
		mould on part of the bread
D	touched by hands washed in water but no soap	mould on part of the bread

P.	Brain	storming
4	225	2
	11	
gnimaate		14

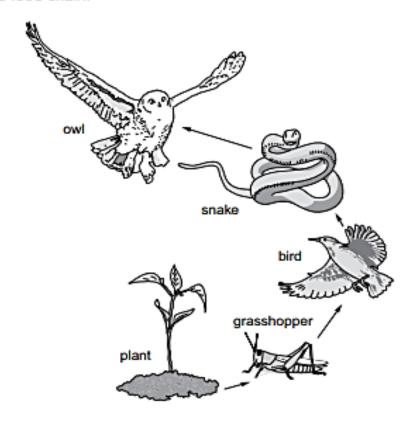
(a)	Which	scientific	question	is	Priya	investigating?
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	Tick (✓) one box.		gnimaatenin
	Is mould a type of fungus?		
	Does temperature affect the growth of mould?		
	Which type of mould grows on bread?		
	Does washing hands stop the growth of mould?		
(b)	Write down two variables Priya controls in her inves 1		
(c)	Priya does not open the bags at the end of the invest Suggest why this is important.	igation.	

Food chains and webs

Q22)

Look at the food chain.



Complete the sentences about this food chain.

(a) The plant is at the start of the food chain. The plant is a	
(b) The plant gets energy from the	
(c) The owl is a consumer that hunts for food. The owl is a	
(d) The bird hunts and catches the grasshopper f	

Q2	3
~-	- /

Foo	od chains are made up of producers, consumers, predators and prey.
(a)	What is a producer?
(b)	What is a consumer?
(c)	What is a predator?

(d) The number of predators in a food chain increases.

What happens to the number of their prey?

Circle the best answer.

always doubles

always halves

decreases

increases

stays the same



Q24	.)

Complete the sentences about food chains.			
Choose from			
consumer			
food chain			
habitat			
producer			
predator			
prey			
All food chains start with a			
An animal that eats a plant is a			
An animal that chases and eats another animal is a			
An animal eaten by another animal is a			

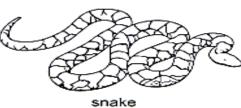
Q25)					
	Complete the sentences about food chains. Choose from the following words.				
Eacn	word can be use	ea once, mor	e than once, of	not at all.	
	consumer	habitat	predator	prey	producer
Food	chains start with	na			
	nimal that eats p		l a		
An an	nimal that eats a	nother anima	l is called a		
Q26)					
Complete the sentences about food chains.					
A food chain shows therelationship.					
The ani	mal that chases	and eats oth	er animals is c	alled a	
A plant	that makes its o	wn food is ca	lled a		·

Q27) The pictures show some living things found in a desert.









- (a) Draw arrows (→) between the pictures to make a food chain.
- (b) Name the producer in this food chain.

(c) The producer uses energy.

Where does it get its energy from?

Tick (✓) one box.

food	
rain	
soil	
Sun	
wind	

(d) Name one predator in this food chain.

(e) Use one word to complete the sentence.

plant

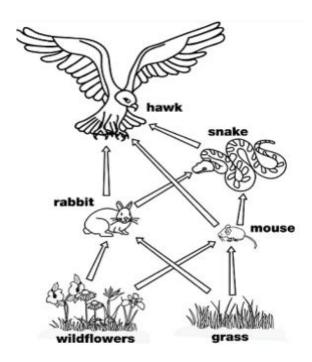
predator

prey producer

An animal being hunted by another animal is the

Q28)

A food web shows how energy is passed on from one living thing to the next. It shows the feeding habits of different animals that live together in an ecosystem.



Use the food web in the picture above to answer the questions.

- 1. Name the living things in the food web that are producers.
- 2. Name the living things in the food web that are consumers.
- 3. Which living things does the snake eat?
- 4. Which living things does the hawk eat?
- 5. What is eaten by the rabbit? _____

Q29)

Anastasia finds pictures of some animals.











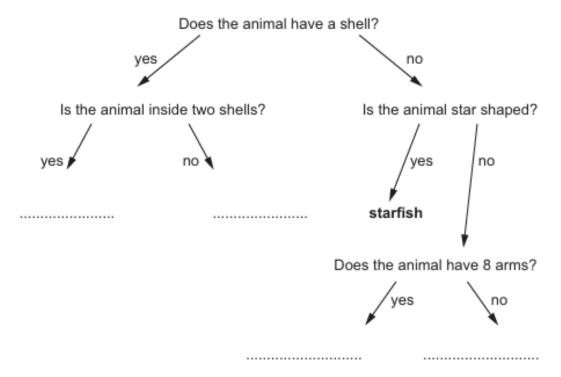


Not drawn to scale

(a) Anastasia uses the pictures to make a key.

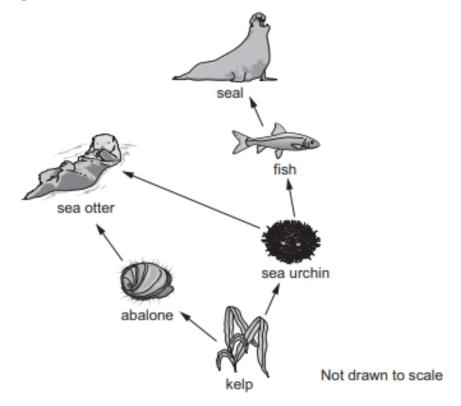
Complete the key.

One animal has been done for you.



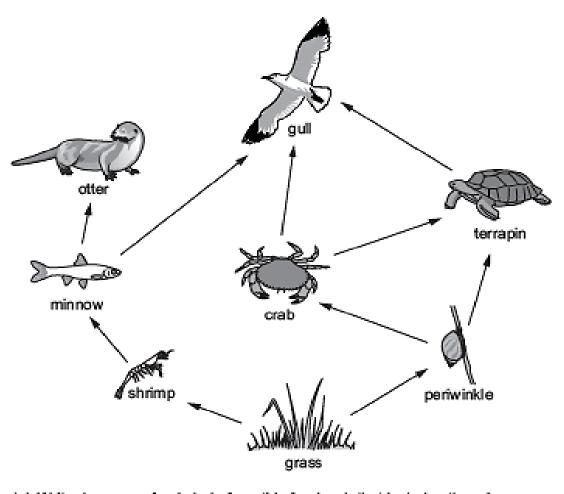
(b) The snail is a herbivore in a food web.	
A producer starts the food web.	
Complete the sentence.	
The source of energy for the producer in the food web is the	
(c) A toxic substance is found in the soil.	
Describe how the toxic substance moves from the soil into the body of a snail in the food web.	

The diagram shows an ocean food web.



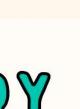
(a)	Write down a food chain from the food web that includes the fish.
(b)	Write down the name of one herbivore in the food web.
	(c) A toxic substance enters the ocean.
	The kelp absorbs this toxic substance.
	Explain how this toxic substance moves from the kelp to the sea otter.
	•••••••••••••••••••••••••••••••••••••••
	(d) Write down the name of the energy source for the food web.

Look at the food web from a wetland habitat.



(a) Write down one food chain from this food web that includes the minnow.(b) Write down the name of one carnivore from this food web.(c) Write down the name of one living thing in this food web that gains energy from the terrapin.





CHEMISTRY

Chemistry

Properties of materials

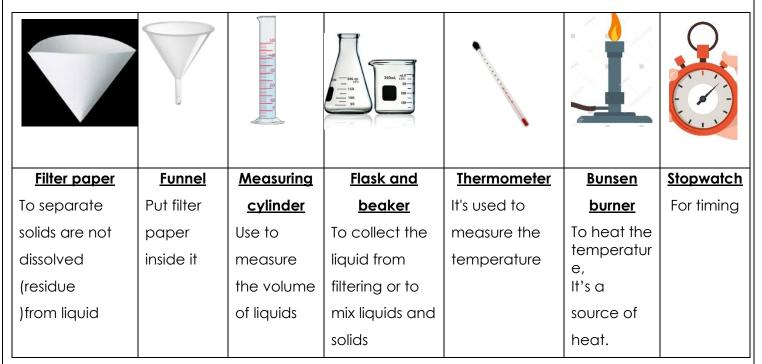
- -Know that the temperature at which a substance changes state is a property of the substance.
- Know that gases have properties, including mass.
- -Understand that electrical conductivity and thermal conductivity are properties of a substance.

Changes to materials

- Identify and describe physical changes that are reversible.
- -Describe how temperature affects solids dissolving in liquids and relate it to the particle model.
- Describe the difference between boiling and evaporation.
- -Understand that chemical reactions involve substances, called reactants, interacting to form new substances, called products.
- Observe and describe the evidence that a chemical reaction has taken place (limited to a gas being produced, colour change and change in temperature).



*Laboratory equipment or apparatus:



*Laboratory safety rules:

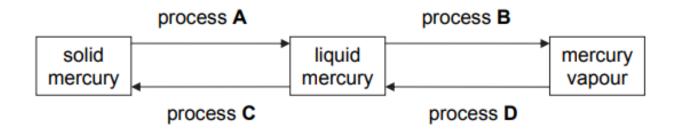


Q1)

Mercury vapour is very poisonous.

Mercury is a silver coloured liquid at room temperature.

Liquid mercury has to be cooled to make solid mercury.



Complete the sentences.

	a	Process A	changes	solid mercu	ry into lic	quid mercury	y.
- 1					3		

This process is

(b) Process B changes liquid mercury into mercury vapour.

(c) Process C changes liquid mercury into solid mercury.

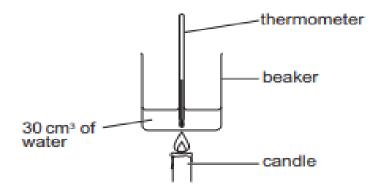
This process is _____.

(d) Process D changes mercury vapour into liquid mercury.

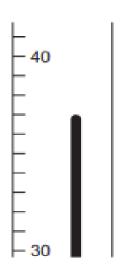
This process is .

Q2) Pierre uses a candle to heat a beaker of water.

Here is a diagram of his experiment.



(a) The diagram shows the thermometer after 10 minutes.



What is the temperature of the water after 10 minutes?

°C

(b) At the start the temperature of the water was 20 °C.

What is the temperature increase?

°C

(c)	Pierre continues to heat th	e beaker.				
	What happens to the water	r when its temperature reaches 100 °C?				
(d)	Pierre sees some liquid wa	ax at the top of the candle.				
	What process has happen	ed to the solid wax?				
Q3)	Draw a line to match each materia	al to its correct description at room temperature.				
	material	description				
		flammable liquid				
	gasoline	colourless gas				
	gold	green gas				
	mercury	attracted to a magnet				
	oxygen	shiny solid				
		silver liquid				

Ahmed investigates the solubility of four substances A, B, C and D Q4) He wants to find which substance is the most soluble. In his first experiment he uses 25 cm3 of water at a temperature of 20 °C adds substance A to the water until it just stops dissolving records the mass of substance A that has dissolved. Ahmed then tests substances B, C and D. (a) Ahmed wants to do a fair investigation. What volume of water should he use in each experiment? (b) Ahmed wants to do a fair investigation. What temperature of water should he use in each experiment? (c) Gabrielle suggests that Ahmed should do each experiment again. Why is it a good idea to repeat experiments? (d) Ahmed decides to investigate the solubility of substance A at higher temperatures of water.

Suggest a possible prediction for this investigation.

Q 5)	
The	e freezing point of a material is the temperature when a liquid becomes a solic
(a)	What is the meaning of the words boiling point?
(b)	Write down the temperature of the boiling point of water.
	Include the units.
(c)	What is the meaning of the words melting point?
(d)	Write down the temperature of the melting point of water.
	Include the units.



Q6) Glucose dissolves in water to make glucose solution.

The table shows the maximum mass of glucose that dissolves in 100 g of water at different temperatures.

temperature in °C	maximum mass of glucose in g
10	40
20	47
30	54
40	61
50	67
60	75

(a) Describe the relationship between the temperature of the water and the maximum mass of glucose dissolved.

Explain your answer using ideas about particles.

description	
explanation	

(b) Identify the solvent and the solute in the glucose solution.

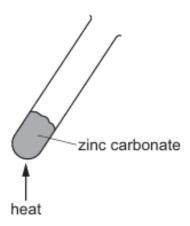
The solute is _____.

(c) Dissolving glucose in water is a physical change.

Explain why dissolving is a physical change.

Jamila heats 3.5 g of solid zinc carbonate.

Look at the diagram of the equipment Jamila uses.



Jamila heats the solid zinc carbonate in the test-tube for five minutes.

She notices that during the heating a gas is made.

After heating she lets the test-tube and its contents cool.

She finds there is only 2.6 g of solid left in the test-tube.

(a) Calculate the decrease in mass of solid after heating.

	s
(b) Explain why the mass of solid decreases during heating.	
(c) One of the properties of a gas is that a gas has mass. Write down one other property of a gas.	

Q8)
Rajiv adds a piece of iron to copper sulfate solution.
A chemical reaction takes place and the mixture becomes warmer.
Iron is a grey solid and copper sulfate is a blue solution.
After five minutes the iron is covered by a pink solid because copper is made.
The solution changes colour to green because iron sulfate is made.
(a) Write down the name of one reactant in this chemical reaction.
(b) Write down one observation that shows this chemical reaction takes place
(c) Describe one measurement Rajiv makes that shows a chemical reaction takes place.

Chen finds information about the melting points and boiling points of some substances.

substance	melting point in °C	boiling point in °C		
ethanol	-144	78		
propanone	-95	56		
salt solution	-6	106		
water	0	100		

(a)	What is the meaning of the words melting point?
(b)	Which substance has the greatest difference between its melting point and its boiling point?
(c)	Salt solution is a mixture of salt and water.
	Describe the effect of adding salt to the boiling point of water.

Q10)

Look at the table of information about substances.

		property				
substance	electrical conductivity	thermal conductivity	melting point in °C	does it dissolve in water?		
Α	high	high	3670	no		
В	low	low	10	yes		
С	high	high	30	no		
D	high	high	590	no		
E	low	low	35	yes		
F	high	high	970	no		
G	low	low	870	no		

Metals are substances that have these properties:

- · high electrical conductivity
- · high thermal conductivity

(b) Blessy sorts the substances into two groups.

(a) Which substances in the table are metals?

Group 1 contains B, C and E.

Group 2 contains A, D, F and G.

Explain how Blessy sorts the substances into these two groups.

Group 1

Group 2

Acetone is a solvent.

It has a low boiling point and evaporates easily.

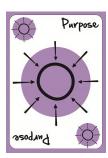
(a) What is the meaning of the word solvent?

- (b) Complete the sentence about the meaning of boiling point.

Boiling point is the	at which a	
becomes a	·	

(c) The evaporation of acetone is a reversible process.

Explain why.	



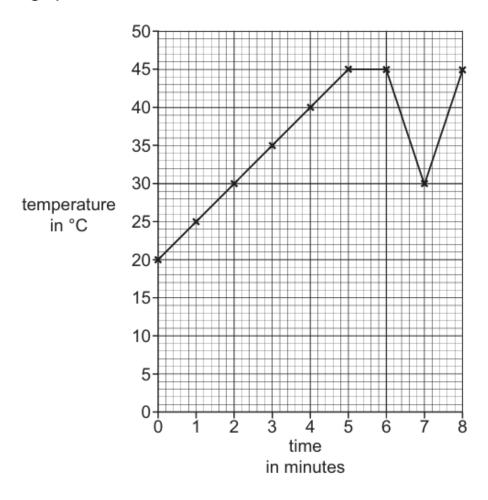
Q12)

Safia heats a white solid substance.

She measures the temperature of the substance every minute.

She plots her results on a line graph.

Here is her graph.



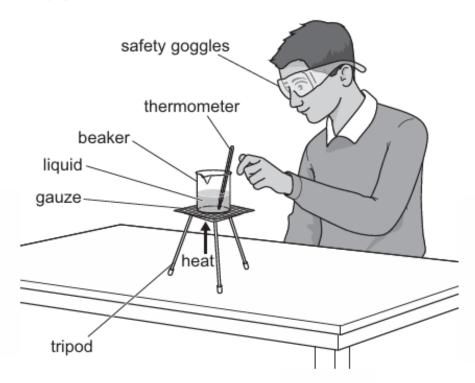
(a) Safia thinks the result at 7 minutes is incorrect.

Suggest why she thinks the result is **incorrect**.

(b)	Safia says,
	'The temperature keeps going up the longer I heat the substance.'
	Tick (✓) to show if Safia is correct.
	yes no
	Explain your answer using information from the line graph.
(c)	Safia decides to repeat her experiment to get a second set of results.
	Explain why this is a good idea.
Q13	Diesel is a liquid fuel used in the engines of some motor cars and trucks.
	(a) Diesel evaporates slowly at room temperature.
	Write down what happens during evaporation.
	(b) Suggest one way to increase the speed of evaporation.
	(c) Evaporation is a reversible change.
	Name the process that is the reverse of evaporation.

Q14) Rajiv heats a liquid until it boils.

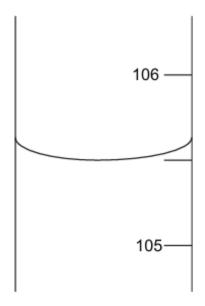
Here is the equipment he uses.



(a) Rajiv is wearing safety goggles.

	Explain why.
(b)	Suggest the name of the equipment he uses to heat the liquid in the beaker.

(c) Look at the diagram of the thermometer.



Write down the temperature reading on the thermometer.

٥(С

(d) Before he starts the experiment Rajiv predicts that the liquid is pure water.

Tick (\checkmark) to show if his prediction is correct.

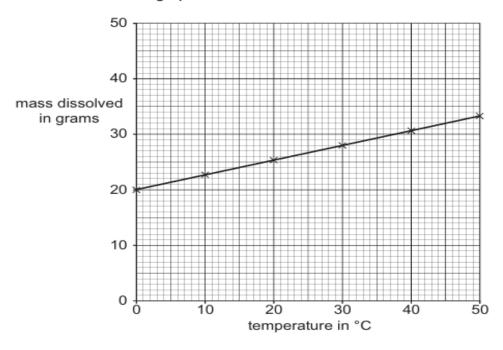
Explain your answer.

Q15) Rajiv dissolves a fertiliser in water.

He records the mass of fertiliser that dissolves in 5 cm3 of water.

Rajiv makes measurements at 6 different temperatures.

He shows his results in a graph.



(a) Rajiv wants to make his results more reliable.

Suggest two ways he can make his results more reliable.

- 2
- (b) Describe the pattern of his results.

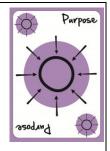
(c) What mass of fertiliser is dissolved in 5 cm³ of water at 30 °C?

____g

(d) Predict the mass of fertiliser that dissolves at 60 °C.

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Q16)



The table shows information about two substances.

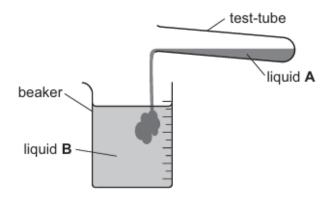
	property		
substance	does it dissolve in water?	does it dissolve in ethanol?	
salt	yes	no	
sugar	yes	yes	

Blessy wants to separate a mixture of salt and sugar.

(α)	one thes to use a magnet to separate the substances.
	This does not work.
	Explain why using a magnet does not work.
(b)	Blessy adds water to some of the mixture.
	She stirs the mixture and then filters it.
	Explain why this does not separate the mixture of salt and sugar.
(c)	Blessy separates the remaining mixture of salt and sugar.
	Describe what she does.

Q17) Lily investigates chemical reactions.

Look at the diagram of her equipment.



Lily adds liquid A from the test-tube into liquid B in the beaker.

A chemical reaction happens.

(a) Complete the sentences about the chemical reaction using words from the list.

Each word can be used once, more than once or not at all.

	product	reactant	solid	temperature
Liquid	I A is a			
Liquid	B is a			
A nev	v liquid substance	forms when liquid	d A and liquid	B are added together.
The n	ew substance is a	1		
Lily kr	nows there is a ch	emical reaction b	ecause she ob	serves bubbles.

Write down what is produced to make bubbles.

(c) Write down two other observations that show a chemical reaction happens.

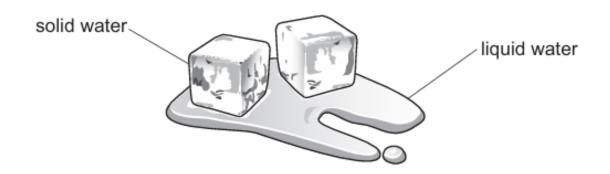
1 _____

2 _____

Q18)

Hassan and Yuri are investigating different chemical processes.

(a) Yuri observes some solid water changing to liquid water.



	Write down one reason why this is a physical change.
(b)	Hassan heats some liquid water to exactly 100 °C.
(~)	Name the process that only happens at exactly 100 °C.

