RECOGNISING ACHIEVEMENT

Oxford, Cambridge and RSA Examinations

GCSE IN APPLIED SCIENCE: DOUBLE AWARD 1497

SPECIMEN ASSESSMENT MATERIALS

This document contains specimen assessment materials for the GCSE in Applied Science. These further specimen questions reflect those found in the original specimen paper (available with the specifications) and are to be used as further practice questions by candidates. They must only be used in conjunction with the original specimen assessment materials which give a guide to the general shape and character of the operational examination paper.

QAN 100/1974/1

CONTENTS

1 Wind farms use wind as fuel.

(a) The wind farm is 60% efficient. Explain what this means.

_____

_____ **[1]**

(b) Some power stations burn oil as a fuel. Describe the steps in the process, from burning the gas to generating the electricity.

_____

_____

_____

_____ **[3]**

(c) The oil power station is less efficient than the wind farm. Suggest why.

_____

_____ **[1]**

(d) There are advantages and disadvantages to using both ways to generate electricity.

(ii) State **two** advantages of using wind, rather than oil, to generate electricity.

_____

_____

_____

_____ **[2]**

(ii) State **two** advantages of using oil, rather than wind, to generate electricity.

_____

_____

_____

_____ **[2]**

[Total: 9]

2 Ranjit is a plant scientist.
He studies how plants can be used.

(a) He knows that plants can be used to provide food for humans. State **two** other useful things that can be obtained from plants.

1 _____

2 _____ **[2]**

(b) Ranjit knows that plants make sugar by photosynthesis. Complete the word equation for photosynthesis.

$$\text{\_\_\_\_\_} + \text{\_\_\_\_\_} \xrightarrow[\text{chlorophyll}]{\text{light}} \text{\_\_\_\_\_} + \text{sugar}$$

[3]

(c) Ranjit wants to increase the rate that plants produce food by photosynthesis. Suggest **two** ways that he could do this.

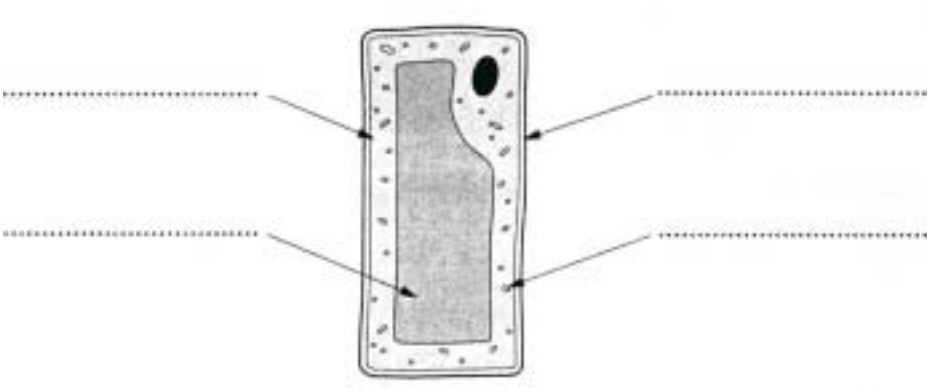
_____

_____

_____ **[2]**

(d) Ranjit looks at a plant leaf cell through a microscope. He draws a simple diagram.

(i) Complete the labels for Ranjit.



[4]

(ii) Put a ring round the part of the cell that is responsible for making sugar by photosynthesis. **[1]**

[Total: 12]

3 The following produces light from electricity:

filament lamp **light emitting diode** **fluorescent tube**

	light %	**heat %**
filament lamp	5	95
light emitting diode	95	5
fluorescent tube	75	25

(a) Which type of light producing device is most efficient? Explain your answer.

_____

_____

_____ **[2]**

(b) A filament lamp draws a current of 0.2 amps. The mains voltage is 230 V. Calculate the power of the lamp when switched on. You are advised to show your working.

_____ unit _____ **[3]**

(c) A large shop uses 100, 60 W fluorescent tubes. The shop is open from 8 o'clock in the morning until 6 o'clock at night. The electricity costs 8 pence per kWh. Calculate how much it costs the shopkeeper each day, to use all the lights.

Use the formula $\textbf{power} = \frac{\textbf{energy}}{\textbf{time}}$

[4]

[Total: 9]

4 Steve is a nurse.
He gives injections to immunise babies from mumps, measles and rubella. This is called the MMR vaccine

(a) Explain how immunisation works. Use the following words to help you.

antibodies antigens injected protection white blood cells

[4]

(b) Explain why it is important that girls receiving the rubella vaccine.

[2]

(c) Steve also gives injections to people who are going abroad for their holidays. The injections protect them from diseases that they might come into contact with while on holiday. Steve tells them that they should have the injections at least six weeks before their holiday. Explain why.

[2]

(d) The MMR vaccine gives protection for many years and only one injection is needed.

However to get protection against the flu virus, an injection is needed every year. Explain why.

[2]

[Total: 10]

5 Iron is obtained from iron ore. Iron ore consists of iron oxide (Fe_2O_3) and impurities.

(a) To extract the iron, the ore is heated with coke and limestone. The reaction gives out a lot of heat.

What is this type of reaction called?

_____ **[1]**

(b) The iron produced is classed as an inorganic, bulk chemical.

(i) Explain what inorganic means.

_____

_____

_____ **[2]**

(ii) Some chemicals are called 'fine' chemicals. Explain the difference between bulk and fine chemicals.

_____

_____

_____ **[2]**

(c) The chemical equation shows how the limestone reacts when it is heated with the iron ore. Complete the word equation for the same process.

$CaCO_3 + SiO_2 \longrightarrow CaSiO_3 + CO_2$

_____ + silicon dioxide ⟶ calcium silicate + _____ **[2]**

(d) Substances are either elements, compounds, or mixtures. Complete the table for the substances used and produced when making iron. Put ticks (✓) into the correct boxes.

substance	element	compound	mixture
iron ore			
silicon dioxide			
iron oxide			
iron			

[4]

[Total: 11]

6 Ajay is a market gardener.
He grows flowers.

(a) He crosses a plant that has red flowers (RR) with a plant that has white flowers (rr).

(i) Complete the table, to show what sort of flowers Ajay produced.

	R	R
r		
r		

[2]

(ii) What colour are the flowers that Ajay has produced? Explain your answer.

_____

_____ **[2]**

(b) Ajay repeats the cross with two different red flowers (Rr).

	R	r
R	RR	Rr
r	Rr	rr

(i) Put a ring round the white flower in the table. **[1]**

(ii) Explain why one of the flowers he produced was white.

_____

_____

_____ **[2]**

(c) Ajay decides he wants to produce flowers with a shorter stem. Suggest how he could use selective breeding to produce shorter stemmed flowers.

_____

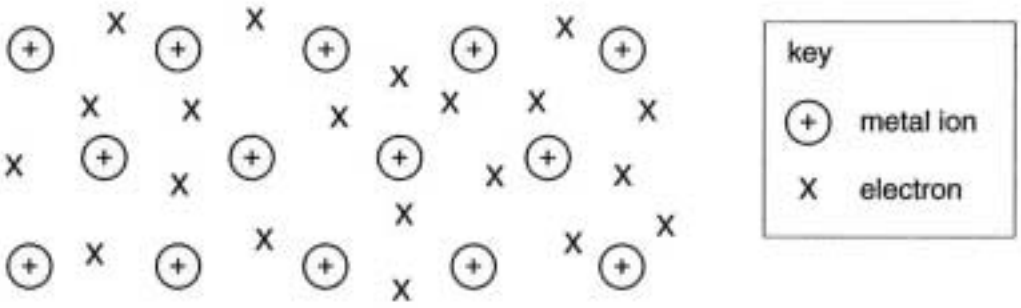
_____

_____

_____ **[3]**

[Total: 10]

7 Sam is metalurgist. He studies and works with metals. He looks at a diagram to show the structure of a metal.



(a) Explain why metals are good conductors of electricity. Use the diagram to help you.

_____

_____

_____

_____ **[3]**

(b) One other property of metals is that they can bend.

(i) State **two** other properties of metals.

1 _____

2 _____ **[2]**

(ii) Sam makes an alloy of iron and manganese.

The alloy is harder and less bendy than pure iron. Suggest why.

_____

_____ **[2]**

[Total: 7]

8 Peter designs boats.

Boats are made from different kinds of materials. The table shows some of their properties.

material	strength	density	flexibility	resistance to corrosion	cost
wood	10	6	not very	rots	quite expensive
steel	100	8	not very	rusts	cheap
glass reinforced plastic	40	2	very	very resistant	quite expensive
aluminium	35	3	fairly	tarnishes	expensive

(a) Glass reinforced plastic is a composite. Explain what composite means.

_____

_____ **[1]**

(b) Peter chose glass reinforced plastic to make the hull of the boat. State **two** reasons why.

1 _____

2 _____ **[2]**

(c) The hulls of very large boats are made from steel. Suggest **one** reason why.

_____ **[1]**

(d) Ceramics are never chosen to make hulls for boats. Suggest why.

_____ **[1]**

[Total: 5]

9 Susan is a motor mechanic. She is replacing the radiator in a cars engine.

The radiator is part of a cooling system. It contains water that prevents the engine from overheating.

(a) Explain why water makes a good coolant. Use your knowledge about the heat capacity of water to help you.

_____

_____

_____ **[2]**

(b) Give **two** disadvantages of using water as a coolant in car engines.

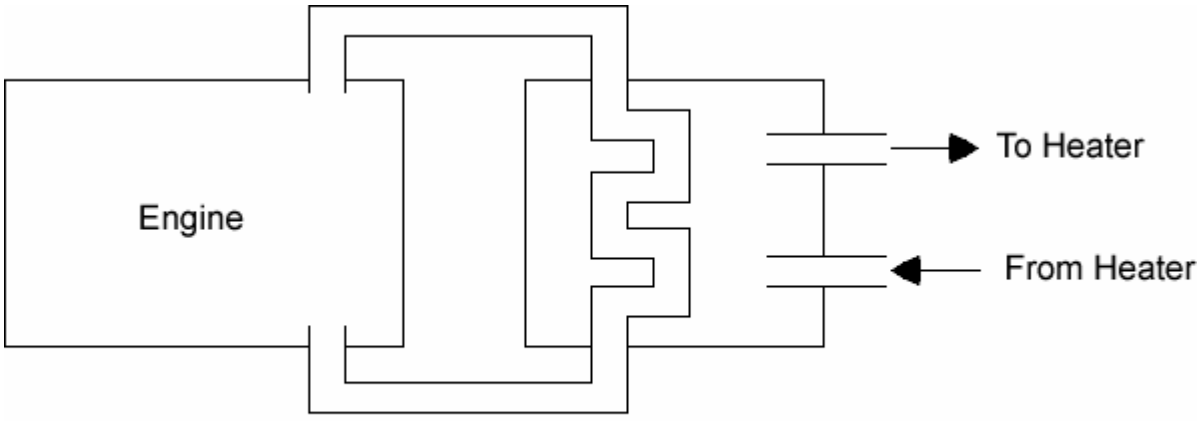
1 _____

2 _____ **[2]**

(c) State **one** feature of the radiator that enables it to cool the water effectively.

_____ **[1]**

(d) Heat from the engine can be used to warm the interior of the car.
Look at the diagram of a heat exchanger.



Heat Exchanger

Explain how this can be used to warm the inside of the car.

_____

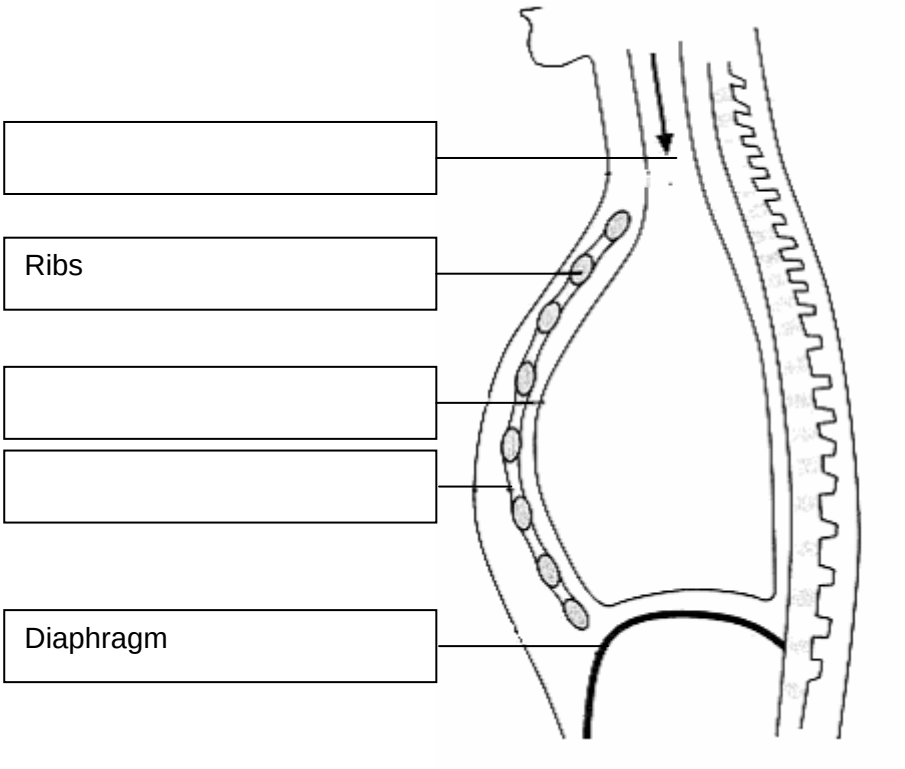
_____

_____ **[2]**

[Total: 7]

10 Richard has asthma. His doctor shows him a diagram of his lungs.

(a) Complete the labels on the diagram.

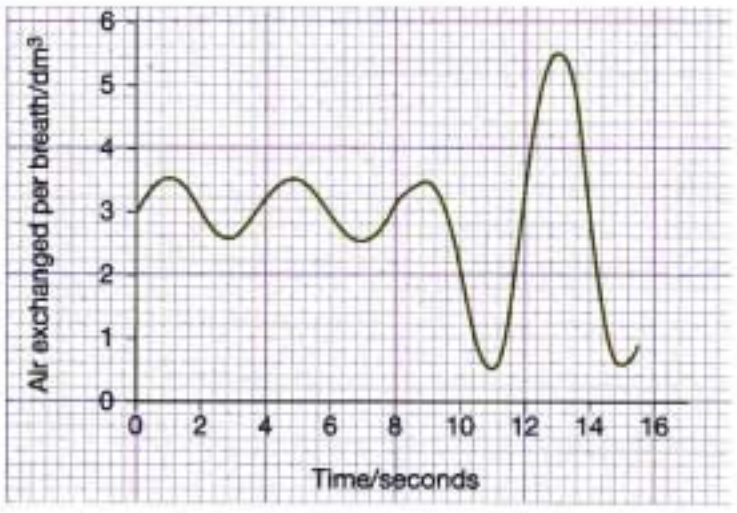


[3]

(b) Explain how Richard moves parts of his thorax when he breathes in.

[3]

(c) The doctor measures Richard's breathing rate.



_____Breaths per minute **[2]**

(ii) Determine the largest amount of air that Richard can breathe in with one breath. You are advised to show your workings.

_____dm^3 **[2]**

[Total: 10]

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

APPLIED SCIENCE: DOUBLE AWARD
UNIT 2: Science for the needs of society

1497/H

HIGHER TIER

MARK SCHEME

Advice to examiners on marking scripts

1 Please ensure that you use the *final* version of the marking scheme.
You are advised to destroy all draft versions.

2 Please mark all post standardisation scripts in red ink. A tick should be used for each answer judged worthy of a mark. The tick should be placed at the point in the answer where the mark has been awarded. The number of ticks should be the same as the number of marks awarded. If two (or more) responses are required for one mark, use only one tick. Half marks should never be used.

3 No comments should be written on scripts.
Remember that scripts may be returned to Centres.

4 The marks awarded for each part question should be indicated in the margin provided on the right hand side of the page. The mark total for each question should be ringed at the end of the question, on the right hand side. These totals should be added up to give the final total on the front of the paper.

5 Correct answers to calculations should gain full credit even if no working is shown unless otherwise indicated in the mark scheme. (An instruction on the paper to 'Show your working' is to help candidates who may then gain partial credit even if their final answer is not correct.)

6 Strike through all blank spaces and/or pages in order to give a clear indication that the whole of the script has been considered.

7 An element of professional judgement is required in the marking of any written paper and candidates may not use the exact words that appear in the mark scheme. If the essence is correct *and* answers the question, contact your Team Leader/Principal Examiner for guidance.

Qn	Expected Answers	Marks	Additional Guidance
1a	60 % of the energy is used / useful / not wasted;	1	
1b	burning fuel releases heat;	1	
	heat turns water to steam;	1	
	steam turns turbine;	1	
1c	less stages / energy transfers;	1	
1di	less pollution;	1	
	does not use up fossil fuels / renewable;	1	
1dii	reliable / wind does not always blow;	1 1	
	uses less land to generate same power;		
	Total	**9**	
2a	any two good examples e.g. cloth / medicines / building materials / fuel / lubricants	2	
2b	carbon dioxide;	1	carbon dioxide and water either way round
	water;	1	
	oxygen;	1	
2c	two from Increase light / temperature / carbon dioxide;	2	
2di	cytoplasm; cell wall; vacuole; chloroplast;	4	
2dii	ring around chloroplast;	1	
	Total	**12**	
3a	light emitting diode / LED;	1	
	more light, less heat;	1	
3b	230 X 0.2;	1	
	46;	1	
	W;	1	
3c	100 X 60;	1	
	6 kW X 10 / 6000W X 10;	1	
	60kWh X 0.8 / 60 X 8;	1	
	£4.80 / 480 pence;	1	
	Total	**9**	

4a	all five words used correctly = 4 marks 4 words used correctly = 3 marks 3 words used correctly = 2 marks 2 words used correctly = 1 mark	4	
4b	protect against rubella / german measles when pregnant; virus can damage unborn baby;	1 1	
4c	body has to make antibodies; which can take several weeks;	1 1	
4d	'flu virus mutates / changes; antibodies no longer work / fit shape;	1 1	
	Total	**10**	
5a	exothermic;	1	
5bi	contains carbon; made from living things;	1 1	
5bii	bulk - made in large quantities; fine - small quantities / purer;	1 1	
5c	calcium carbonate; carbon dioxide;	1 1	
5d	-- -- ✓; -- ✓ --; -- ✓ --; ✓ -- --;	1 1 1 1	
	Total	**11**	
6ai	all 4 Rr = 2 marks any 2 or 3 Rr = 1 mark	2	
6aii	red; R is dominant;	1 1	
6bi	rr;	1	
6bii	r is recessive; no R or red allele present;	1 1	
6c	cross shorter stemmed flowers; select those with shortest stem and cross; repeat several times / generations;	1 1 1	
	Total	**10**	

7a	electricity is flow of electrons; metals have spare electrons; electrons can flow;	1 1 1	
7bi	2 from conduct heat maleable ductile	 2	
7bii	manganese atoms; prevents iron atoms sliding against each other OWTTE;	1 1	
	Total	**7**	
8a	made from two different materials;	1	
8b	two from resistant to corrosion very flexible low density / light	 2	
8c	cheap;	1	
8d	brittle / may shatter;	1	
	Total	**5**	
9a	high specific heat capacity; means that it can absorb a lot of heat therefore good at cooling;	1 1	
9b	can freeze; water expands and bursts radiator;	1 1	
9c	large surface area;	1	Accept has fan
9d	hot water from engine heats water in heater; hot water in heater used to heat car interior;	1 1	
	Total	**7**	
10a	trachea / wind pipe; lungs; (intercostal) muscles;	1 1 1	
10b	diaphragm contracts / lowers; muscles raise ribs; volume of lungs increases / pressure drops so air enters;	1 1 1	
10c	4 X 4;	1	

	16 breaths per minute; 5.5 – 0.5; 5; **Total**	1 1 1 **10**	

BLANK PAGE

Oxford, Cambridge and RSA Examinations

RECOGNISING ACHIEVEMENT

GCSE IN APPLIED SCIENCE: DOUBLE AWARD

1497/H
1497/F

SPECIMEN ASSESSMENT MATERIALS

This document contains specimen assessment materials for the GCSE in Applied Science. These further specimen questions reflect those found in the original specimen paper (available with the specifications) and are to be used as further practice questions by candidates. They must only be used in conjunction with the original specimen assessment materials which give a guide to the general shape and character of the operational examination paper.

QAN 100/1974/1

CONTENTS

1 Jane works in a small family brewery. To ensure that the beer she produces is good enough to drink, it is important to prevent unwanted micro-organisms getting in.

(a) The containers need to be sterile before they are used to make beer. Suggest **two** ways that this could be done.

_____

_____

_____ **[2]**

(b) It is important that Jane does not allow microorganisms to get into the fermenting liquid.

Suggest three ways that Jane makes sure she does not contaminate the beer.

1 _____

_____

2 _____

_____

3 _____

_____ **[3]**

(c) The brewery does not like staff to go to work when they are ill. Which **two** of the following statements is **not** a good reason for this policy? Put ticks (✓) against the **two** best answers

ill workers may contaminate the beer	
microorganisms do not spread easily	
other workers may become ill	
microrganisms are too small to see	
microorganisms are spread easily	
Ill workers recover more quickly at home	

[2]

[Total: 7]

2 Oil is a fossil fuel.

(a) Name **two** other fossil fuels.

1 _____

2 _____ **[2]**

(b) Fossil fuels are hydrocarbons.

Put a ring round the two chemical elements always found in hydrocarbons.

calcium carbon helium hydrogen oxygen sulphur

[2]

(c) Some power stations such as wind and hydroelectric, do not use fossil fuels.

(i) Suggest **two** advantages of using power stations such as these.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ **[2]**

(ii) Suggest **one** disadvantage of using each type of power station.

Wind _____

_____

hydroelectric _____ **[2]**

(iii) Wind power and hydroelectric are examples of renewable energy sources.

Give **one** other example and use it explain what is meant by renewable energy.

_____

_____ **[2]**

[Total: 10]

3 Rebecca designs motorbikes.

(a) She uses different materials, each with different properties. These are some of the materials she uses.

ceramics composites metals polymers

Use these words to complete the table below. Each word may be used once, more than once, or not at all.

description	material
made from two different materials	
conducts heat and electricity	
very hard and brittle with a high melting point	
flexible and can be made of many different colours. Melt or chars when heated.	
hard and can be hammered into shape	

[5]

(b) There are advantages and disadvantages of using different materials.

(i) State **one** advantage of using a composite.

_____

_____ **[2]**

(ii) Suggest a type of material for making the fairing on the motorbike. Explain your choice.

Material _____

Explanation _____

_____ **[2]**

(iii) Suggest why Rebecca did not use plastic for making the exhaust pipe.

_____ **[1]**

4 *Outdoor Leisure* make clothing for outdoor activities.

They use the following label on their clothing.

Outdoor Leisure				
material	**Strength 10 = strongest 1 = least strong**	**Stretch 10 = most stretchy 1 = least stretchy**	**Absorbency 10 = most absorbent 1 = least absorbent**	**Warmth 10 = most warm 1 = least warm**
wool	1	5	10	9
neoprene	5	5	1	9
Lycra ™	3	10	5	1
leather	7	2	5	5
Gore-Tex ™	5	4	1	10
cotton	4	4	9	2

Use the information on the label to answer the following questions.

(a) Name the **three** materials that are not obtained from living organisms.

1 _____

2 _____

3 _____ **[2]**

(b) Mountaineering jackets need to be warm and waterproof. Name the best material to use.

_____ **[1]**

(c) State **two** reasons why wool is not a good material to make mountaineering jackets.

_____

_____ **[2]**

(d) Neoprene is used to make diving suits. Write down two advantages that neoprene has over cotton, to make diving suits.

1 _____

2 _____ **[2]**

[Total: 7]

5 Jack drives a gritting lorry.
He puts rock salt onto icy roads in winter.

The rock salt causes the ice to melt. Rock salt contains both salt and sand.

(a) Which of the following words best describes rock salt?
Put a ring round the correct answer.

compound **element** **mixture** **solution** **[1]**

(b) Rock salt is an inorganic chemical. Explain what inorganic means.

_____

_____ **[2]**

(c) Rock salt can be separated into sand and salt using a standard procedure.

Look at the following steps of the standard procedure. They are not in the correct order. Write out the numbers in the correct order. The first one has been done for you.

1 filter the mixture
2 heat and stir the rock salt and water
3 allow the evaporating basin to cool and then remove the salt
4 mix the rock salt with water
5 heat the evaporating basin
6 place the filtered liquid into an evaporating basin

_____ **[4]**

(d) Rock salt is an example of a bulk chemical. Explain what is meant by a bulk chemical.

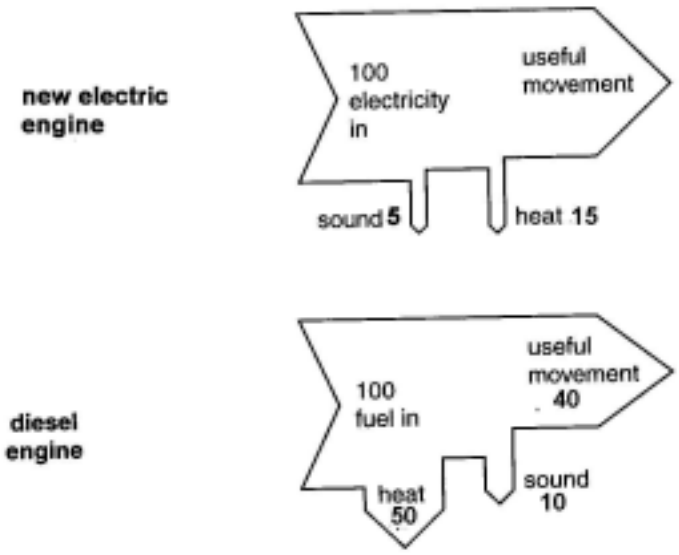
_____

_____

_____ **[2]**

[Total: 9]

6 Joy is a motor mechanic.
She wants to know how efficient different engines are. She finds these diagrams about new electric and diesel engines.



(a) State how much sound energy is obtained from the electric engine. Put a ring around the correct answer.

5 **15** **80** **100** **[1]**

(b) State the energy efficiency of the diesel engine. Put a ring around the correct answer.

10% **40%** **50%** **100%** **[1]**

(c) Calculate the efficiency of the electric engine. You are advised to show your workings.

_____% **[2]**

(d) Complete the sentences about how the electric engine transfers energy. Choose from the following words. You may use each word more than once, or not at all.

heat in less more out sound

The electric engine transfers energy into_____, heat and

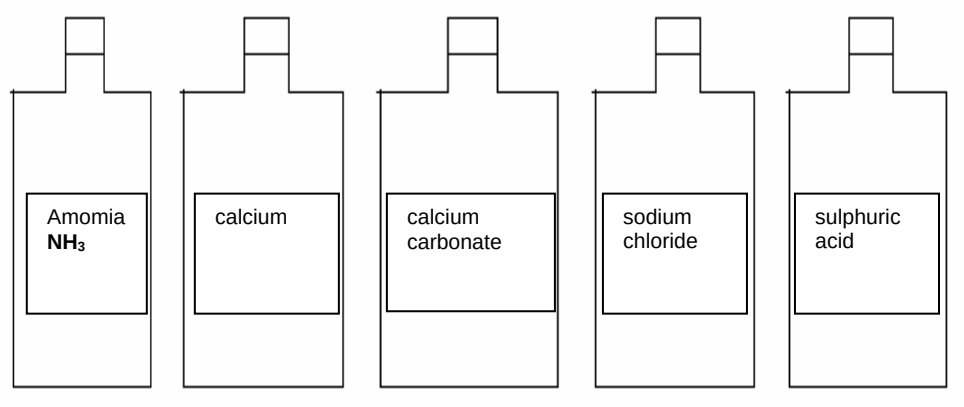
useful movement. When the energy is transferred it spreads

_____and becomes _____ useful. Most wasted

energy is in the form of_____ **[4]**

[Total: 8]

7 Look at the pictures of some reagent bottles found in a chemistry laboratory.



(a) Write the correct chemical formula on each bottle. One has been done for you. Choose formulae from the following list.

Ca **$CaCO_3$** **H_2SO_4** **NH_3** **NaCl** **[4]**

(b) State which bottle contains a single element.

_____

_____

_____ **[1]**

(c) State which formula contains the most atoms.

_____

_____

_____ **[1]**

(d) List the three elements found in $CaCO_3$.

1 _____

2 _____

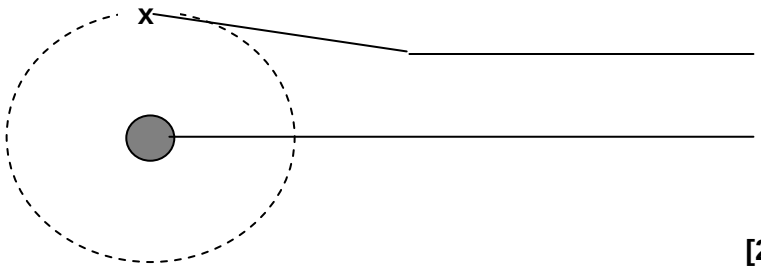
3 _____ **[3]**

(e) When sulphuric acid is dripped into water, it gives out heat. What is this type of reaction called?
Put a ring around the correct answer.

endothermic **exothermic** **hydrothermic** **poikilothermic** **[1]**

(f) Look at the diagram of a hydrogen atom. Label the diagram. Choose words from the following list.

compound **electron** **element** **mixture** **nucleus**



[2]

[Total: 12]

8 Joy works in a hospital. She prepares a slide of blood. She uses a standard procedure to make the slides.

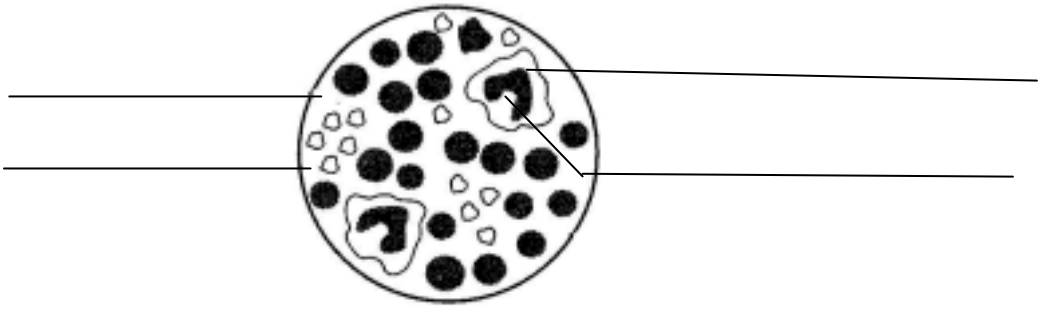
(a) Number the following statements in the correct order, inserting your answers in the boxes provided.

View slide through microscope	
Blot up excess liquid	
Add drop of blood and stain to slide	
Add cover slip	

[3]

(b) Use the following words to complete the labels on the diagram.

plasma **platelets** **red blood cell** **white blood cell**



[3]

[Total: 6]

9 Raj is an environmental scientist.

(a) He sometimes needs to use different sources of energy.

He can use
- solar panels
- mains electricity
- batteries

Using these three sources of energy, suggest the best source of energy for each of the following. Explain each choice.

'Slow down' road signs for use on country bends.

source _____

explanation _____

_____ **[2]**

Raj's mobile phone _____

source _____

explanation _____

_____ **[2]**

Inner city traffic lights

source _____

explanation _____

_____ **[2]**

(b) Raj also gives advice on insulating buildings.

Which two methods show the best way to insulate a building?
Put rings around the **two** best methods.

air conditioning **cavity wall foam** **draft excluders** **low energy bulbs**

[2]

[Total: 8]

10 Giles and Henry are farmers.

The table shows some of the methods they use on their farm.

Giles	Henry
uses a combine harvester	uses a combine harvester
uses natural fertilisers	uses artificial fertilisers
removes weeds with a mechanical hoe	kills weeds with a chemical spray
keeps free range chickens	keeps chickens in shed
has a few large fields	has lots of small fields divided by hedgerows

(a) State **three** ways that Giles farms organically.

1 _____

2 _____

3 _____ **[3]**

(b) Henry says he is an intensive farmer. Give **one** reason why this is not completely true.

_____

_____ **[1]**

(c) Henry's chicken's lay bigger eggs than Giles' chickens. He has been selectively breeding them for many years. Explain how Henry may have selectively bred his chickens.

_____

_____

_____

_____

_____ **[4]**

BLANK PAGE

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

PPLIED SCIENCE: DOUBLE AWARD
UNIT 2: Science for the needs of society

1497/H

HIGHER TIER

MARK SCHEME

Advice to examiners on marking scripts

3 Please ensure that you use the *final* version of the marking scheme.
You are advised to destroy all draft versions.

4 Please mark all post standardisation scripts in red ink. A tick should be used for each answer judged worthy of a mark. The tick should be placed at the point in the answer where the mark has been awarded. The number of ticks should be the same as the number of marks awarded. If two (or more) responses are required for one mark, use only one tick. Half marks should never be used.

3 No comments should be written on scripts.
Remember that scripts may be returned to Centres.

7 The marks awarded for each part question should be indicated in the margin provided on the right hand side of the page. The mark total for each question should be ringed at the end of the question, on the right hand side. These totals should be added up to give the final total on the front of the paper.

8 Correct answers to calculations should gain full credit even if no working is shown unless otherwise indicated in the mark scheme. (An instruction on the paper to 'Show your working' is to help candidates who may then gain partial credit even if their final answer is not correct.)

9 Strike through all blank spaces and/or pages in order to give a clear indication that the whole of the script has been considered.

7 An element of professional judgement is required in the marking of any written paper and candidates may not use the exact words that appear in the mark scheme. If the essence is correct *and* answers the question, contact your Team Leader/Principal Examiner for guidance

OCR		Specification 1497 Foundation	MARK SCHEME	Pages = 3
Qn	**G**	**Expected Answers**	**Marks**	**Additional Guidance**
1 a		Heating; Disinfectant;	1 1	
1 b		Any three good ways eg Hair net / hair tied back; Overalls; Face mask; Gloves; Not work when ill;	3	
1 c		Microorganisms do not spread easily; Microorganisms are too small to see;	1 1	
		Total	**7**	
2a		Coal; Gas;	1 1	
2b		Carbon; Hydrogen;	1 1	
2ci		Renewable / do not use fossil fuels; Less pollution;	1 1	
2cii		One from Use a lot of land Wind does not always blow;	1	
		One from Need lots of water; Need valley or suitable land;	1	
2ciii		Wave / solar; Does not consume resource / is replaced.	1 1	
		Total	**10**	

3a		Composite; Metals; Ceramics Polymers; Metals;	1 1 1 1 1	
3bi		Combines the properties; Of two different materials;	1 1	
3bii		Plastic / polymer; Bright colours / flexible / light	1 1	
3biii		Melts or chars when heated;	1	
		Total	**10**	
4a		Neoprene Lycra Gortex	 2	Any order 3 correct = 2 marks 2 or 1 correct = 1 mark
4b		Gore tex;	1	
4c		Too absorbent; Not strong;	1 1	
4d		Not absorbent; Warm;	1 1	
		Total	**7**	
5a		Mixture;	1	
5b		Does not contain carbon; Not made from living things;	1 1	
5c		2 left of 1 1 left of 6 6 left of 5 5 left of 3	1 1 1 1	
5d		made in large quantities; not necessarily pure;	1 1	
		Total	**9**	
6a		5:	1	
6b		40;	1	
6c		100 – 5+15; 80;	1 1	
6d		sound; out; less; heat;	1 1 1 1	
		Total	**8**	

7a		Calcium Ca; Calcium carbonate $CaCO_3$; Sodium chloride NaCl; Sulphuric acid H_2SO_4;	1 1 1 1	
7b		Calcium;	1	
7c		H_2SO_4;	1	
7d		Cacium; Carbon; Oxygen;	1 1 1	Any order
7e		Exothermic;	1	
7f		Electron; Nucleus;	1 1	
		Total	**12**	
8a		Add drop ……; Add cover slip……; Blot up …….; View; …….;	3	4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 marks
8b		Platelet; plasma; Red blood cell; white blood cell;	3	4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 marks
		Total	**6**	
9a		Solar panels; No electricity supply available; Battery; No wires OWTTE; Mains electricity; Consistent supply;	1 1 1 1 1 1	
9b		Cavity foam; Draft excluders;	1 1	
		Total	**8**	
10a		Natural fertilisers; Mechanical hoe; Free range chickens;	1 1 1	
10b		Has hedgerows;	1	
10c		Get hen that lays biggest eggs;	1	

		Breed with cockrel that has fathered large egg hens; Pick hens that lay largest eggs; Repeat fro several generations; **Total**	 1 1 1 **8**	