FOR OFFICIAL USE			



	KU	PS
Total Mark		

3700/401

NATIONAL QUALIFICATIONS 2007

MONDAY, 21 MAY 9.00 AM - 10.00 AM SCIENCE STANDARD GRADE Foundation Level

Fill in these boxes and read what is printed below.	
Full name of centre	Town
Forename(s)	Surname
Date of birth Day Month Year Scottish candidate number	Number of seat
1 Answer as many questions as you can.	
2 Read the whole of each question carefully before yo	u answer it.
3 Write your answers in the spaces provided. Showing	g working may help in some questions.
4 Before leaving the examination room you must give not, you may lose all the marks for this paper.	e this book to the invigilator. If you do



1. Pa	art of the index of a bo	ook is shown b	oelow.		Marks	KU	U PS
	crylic	25	Flexibility	43			
\mathbf{A}	lloys – brass	33	Galvanising	29			
	– bronze	34	Hardness	48			
	– solder	36	Leather	9			
	- steel	35	Metals – aluminium	23			
	nodising	27	– copper	22			
	auxite	26	– tin	24			
	arbon fibres	41	Ores	20			
	lay	13	Polyester	51			
	yes	54	Rubber	46			
El	lectroplating	28	Wood	44			
(a) Which two pages so of carbon fibres?	should Craig l	ook up to find out about th	e flexibility			
	Pages and						
(h) Tames looked up no	ages 34 and 48					
(b)	(b) James looked up pages 34 and 48. What was he trying to find out about?						
	what was ne trying	g to find out at	out:				
					1		
2. T	he boxes below show	different sets	of substances.				
	wood		etrol				
	glass	_	aper				
	concrete		lcohol				
	3 brass	4	To to u				
	aluminium		vater Icohol				
	steel		rude oil				
W	hich box shows						
(a	a) substances that all catch fire easily?						
	Box number				1		
(b)) substances that are	all liquids?					
	Box number				1		
[3700/4	-01]	Pa	ge two				

			THIS M	ARG
3.	Some information about light bulbs is shown below.	Marks	KU	PS
J.	Warmglow and Softlight are candle bulbs.			
	Maxlight and Superspot are pygmy bulbs.			
	Warmglow has a bayonet fitting as does Maxlight.			
	Softlight and Superspot have edison fittings.			
	Use this information to complete the key below.			
	Light hulbs			
	Light bulbs			
	pygmy			
Гь	payonet edison edison			
	fitting fitting fitting fitting			
_				
XX 7	Yarmglow Maxlight			
VV	Varmglow Maxlight	2		
4.	Which box shows two basic needs of human beings?			
	air and water food and work			
	3 4			
	work and shelter money and warmth			
	Box number	1		
	[Turn over			

[3700/401]

 $Page\ three$

5.	(a)	Wh	tich electrical appliance costs most to use for 1 hour?	Marks	KU	PS
		A	Vacuum cleaner			
		В	Computer			
		С	Cooker			
		D	Bedroom lamp			
		<u>Un</u>	derline the correct answer.	1		
	(b)	Wh	ich part of an electric heater keeps the temperature steady?			
		A	Earth wire			
		В	Thermostat			
		C	Fuse			
		D	Switch			
		<u>Un</u>	derline the correct answer.	1		
6.	(<i>a</i>)	ide o	vil is a fossil fuel. Name one other fossil fuel.	1		
		(ii)	Name the gas in air that is used up when fossil fuels burn.	1		
				1		
	A Vacuum cleaner B Computer C Cooker D Bedroom lamp Underline the correct a (b) Which part of an electric A Earth wire B Thermostat C Fuse D Switch Underline the correct a Crude oil is a fossil fuel. (a) (i) Name one other form	ny different products can be obtained from crude oil.				
			me one other product obtained from crude oil.			
		••••		1		
[3700	0/40	1]	Page four			

7.]	Kat	ie and Penny played football.			Marks	KU	PS
		nediately after the game their		- / 10		Marks 1 1	
		er resting, their pulse rates wer	_	n. 20			
,	Γ'nϵ	e results are shown in the table	below.				
					£ \		
				COMPANY TO THE STATE OF THE STA	Jan. Jan. 17.		
o: 1			rate (beats per m	inute)			
Girl		Immediately after	After	Change in			
Katie	<u> </u>	the game	resting 100	pulse rate			
		104	74				
renn	ıy ——	104	74				
((a)	Calculate the change in pulse	rate for each airl	and complete the table			
,	<i>(u)</i>	Calculate the change in pulse	Tate for each giff		·•		
		Space for working					
					1		
((b)	Complete the following senter	nce.				
		Immediately after the game, I	Katie's heart wa	s heating at			
		beats per minute.	ixatic 3 iicait wa	s beating at	1		
((c)	Who is fitter, Katie or Penny?)				
	` /	•					
		Explain your answer.					
					····		
				•••••	1		
((d)	Playing football regularly imp	proved the girls's	stamina.			
		Stamina is one aspect of fitnes	ss.				
Afte	Name one other aspect of fitr	ness.					
					1		
					1		
-2-00	110		D (1	[Turn ove	er		

 $Page\,five$

	Marks	KU	PS
A food web from a woodland habitat is shown below.			
shrew vole leaves earthworm			
(a) Where do the leaves get their energy from?			
	1		
(b) The owl hunts and kills rabbits for food.			
What word is used to describe an animal that hunts and kills other animals for food?			
	1		
	•		
(c) An omnivore is an animal which eats both plants and animals.			
Name the omnivore in this food web.			
	1		
(d) Using the food web shown above, write down a food chain containing four organisms.			
→→	1		
	1		

[3700/401] Page six

8.

	drive water pumps. Modern wind turbines also use the power of the w However, a modern wind turbine turns a generator which produced electricity. The electricity produced by wind turbines goes into the National Grid. National Grid then carries the electricity to homes and indust throughout Britain. A 600 kW wind turbine can supply the electricity needed for households. Although wind speeds are always changing, there is usue enough wind to operate the turbine for 70% of the time. A wind turbin designed to last for about 20 years. However, moving parts such blades and gearboxes must be regularly maintained to prevent the viturbine from breaking down. (a) What were traditional windmills used for? (b) What happens to the electricity after it goes into the National Grid? (c) How many households can a 600 kW wind turbine supply? (d) Name two parts of a wind turbine that must be regularly maintained ma	Marke	KU	PS	
9.	Use	e the information in the passage to answer the questions.	11141113		
	driv Hov	e water pumps. Modern wind turbines also use the power of the wind. vever, a modern wind turbine turns a generator which produces			
	Nat	ional Grid then carries the electricity to homes and industries	use the power of the wind to turn mill stones and Modern wind turbines also use the power of the wind. In wind turbines also use the power of the wind. In wind turbines goes into the National Grid. The carries the electricity to homes and industries being can supply the electricity needed for 400 gh wind speeds are always changing, there is usually ate the turbine for 70% of the time. A wind turbine is about 20 years. However, moving parts such as sees must be regularly maintained to prevent the wind grown. In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid? In the electricity after it goes into the National Grid?		
	hou eno des blac	seholds. Although wind speeds are always changing, there is usually ugh wind to operate the turbine for 70% of the time. A wind turbine is igned to last for about 20 years. However, moving parts such as des and gearboxes must be regularly maintained to prevent the wind			
	(a)	What were traditional windmills used for?	1		
	(<i>b</i>)	Use the information in the passage to answer the questions. Traditional windmills use the power of the wind to turn mill stones and drive water pumps. Modern wind turbines also use the power of the wind. However, a modern wind turbine turns a generator which produces electricity. The electricity produced by wind turbines goes into the National Grid. The National Grid then carries the electricity to homes and industries throughout Britain. A 600 kW wind turbine can supply the electricity needed for 400 households. Although wind speeds are always changing, there is usually enough wind to operate the turbine for 70% of the time. A wind turbine is designed to last for about 20 years. However, moving parts such as blades and gearboxes must be regularly maintained to prevent the wind turbine from breaking down. (a) What were traditional windmills used for? (b) What happens to the electricity after it goes into the National Grid? (c) How many households can a 600 kW wind turbine supply? (d) Name two parts of a wind turbine that must be regularly maintained. and			
	(c)	How many households can a 600 kW wind turbine supply?			
	(<i>d</i>)	Use the information in the passage to answer the questions. Fraditional windmills use the power of the wind to turn mill stones and drive water pumps. Modern wind turbines also use the power of the wind. However, a modern wind turbine turns a generator which produces electricity. The electricity produced by wind turbines goes into the National Grid. The National Grid then carries the electricity to homes and industries throughout Britain. A 600 kW wind turbine can supply the electricity needed for 400 households. Although wind speeds are always changing, there is usually enough wind to operate the turbine for 70% of the time. A wind turbine is designed to last for about 20 years. However, moving parts such as plades and gearboxes must be regularly maintained to prevent the wind urbine from breaking down. A) What were traditional windmills used for? (b) What happens to the electricity after it goes into the National Grid? (c) How many households can a 600 kW wind turbine supply? (d) Name two parts of a wind turbine that must be regularly maintained. (a) and 1			

Page seven

10.	Spe	ecial bins are used to separate household rubbish for recycling .	Marks	KU	PS
	(a)	What does recycling mean?			
			1		
	(<i>b</i>)	Glass is one type of waste that can be recycled. (i) Name and other type of waste that can be recycled.			
		(i) Name one other type of waste that can be recycled.	1		
		(ii) A hayashald callested 06 place battles in 12 weeks	•		
		(ii) A household collected 96 glass bottles in 12 weeks. How many bottles were collected, on average, each week?			
		Space for working	sider when choosing		
		Answer	1		
11.	Ас	company is choosing a material for covering chairs.			
		e material must be flame-proofed so that it is safe.			
		ve one other factor that the company might consider when choosing ich material to use.			
	••••		1		
[370	0/40	1] Page eight	•		

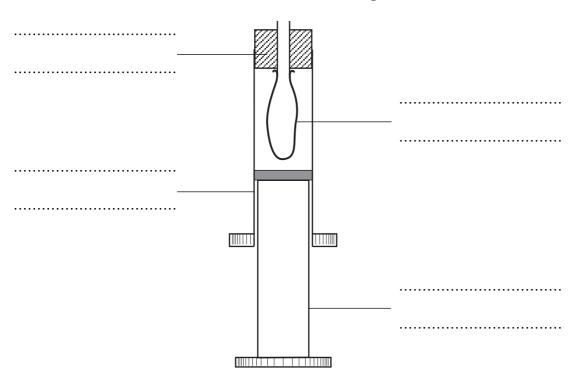
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12. The table describes the parts of a model breathing system.

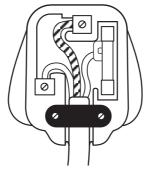
Part of breathing system	Part of model
Ribs	Syringe barrel
Windpipe	Cork with tube
Lungs	Rubber balloon
Diaphragm	Syringe plunger

When the syringe plunger is pulled out, air is drawn into the rubber balloon.

Use the information in the table to label the **parts of the model**.



13. An electrical plug has a live wire, a neutral wire and an earth wire.



(a) Which of the wires has brown insulation?

(b) The earth wire in the plug acts as a safety device.

Name **one** other safety device in a plug.

[3700/401]

Page nine

[Turn over

river. They counted the numbe points in the river. They t	er of caddis measured tl	s fly larva he speed o	e in water	r samples	from five		KU	P
They counted the number points in the river. They received the number of caddis fly	er of caddis measured the table b	s fly larva he speed o	e in water	r samples	from five			
Their results are shown in Speed of river (cm/s) Number of caddis fly	measured the table b	he speed o						
Their results are shown in Speed of river (cm/s) Number of caddis fly	the table b		of the rive	r at each p	ooint.			
Speed of river (cm/s) Number of caddis fly		pelow.						i
(cm/s) Number of caddis fly	50	T						İ
Number of caddis fly	30	100	150	200	250			ı
river. They counted the number points in the river. They Their results are shown in Speed of river (cm/s) Number of caddis fly larvae (a) Complete the conclust As the speed of the rive (b) Water speed is an example and plants live.		100	130	200	230			ı
They counted the numb points in the river. They Their results are shown in Speed of river (cm/s) Number of caddis fly larvae (a) Complete the conclust As the speed of the river. (b) Water speed is an earn plants live. Name one other en	15	20	50	70	80			ı
group of students investigated the number of caddis fly larvae living in a ver. they counted the number of caddis fly larvae in water samples from five points in the river. They measured the speed of the river at each point. Their results are shown in the table below. Speed of river		ı						
() C 1 , 1 1		(1:	\ .1					i I
(a) Complete the conclus	ion below t	by (circling	g) the cor	rect answe	er.			
As the speed of the rive	er increases,	the numbe	er of caddi	s fly larva	e			
								i
	increas	ses						i i
	roup of students investigated the number of caddis fly larvae living in a counted the number of caddis fly larvae in water samples from five tts in the river. They measured the speed of the river at each point. it results are shown in the table below. They measured the speed of the river at each point. They measured the speed of the river at each		i					
river. They counted the numpoints in the river. The Their results are shown Speed of river (cm/s) Number of caddis fly larvae (a) Complete the conclusive the speed of the results are shown (b) Water speed is an and plants live. Name one other experience.	uccicas							
	stays the	same				1		
						1		_
Name one other env	rironmental	factor th	ıat may af	ffect when	re animals			<u></u>
						1		
•••••	•••••	••••••	• • • • • • • • • • • • • • • • • • • •	•••••	•••••	1		
								İ
								i i
								i i
								ı
								i
								i
								i
								l l
				n water samples from fine river at each point. 150 200 250 50 70 80 the correct answer. f caddis fly larvae ich affects where anima				l l
								ì
								1

Page ten

st								
1	eel b	ridge	nylon carpe	gold ring	g			
gl	lass v	ase	wooden fen	ce aluminiu	ım ladder			
(a)	Whi	ich of the ol	ojects is most	likely to be damag	ed by			
	(i)	insect pes	ts?					
							1	
	<i>(</i> ''')						•	
	(ii)	corrosion	f					
							1	
(b)	Whi	ich of the ol	ojects is most	ikely to be protect	ed against d	amage by		
	(i)	anodising	?					
							1	
	(ii)	polystyrer	ne packaging?					
	(11)	polystyrer					1	
		•••••	•••••			• • • • • • • • • • • • • • • • • • • •	1	
He Wh	conn	ected 4 cop	nass of the wa	nk in a house. The tank. Each pipe over tank and the fou		of 2 kg.		
He Wh	conn	ected 4 cop the total m	per pipes to the war	ter tank and the for	ar pipes?	of 2 kg.	2	
He Wh	conn	ected 4 cop the total m	per pipes to the war	ne tank. Each pipe	ar pipes?	of 2 kg.	2	
He Wh	conn	ected 4 cop the total m	per pipes to the war	ter tank and the for	ar pipes?	of 2 kg.	2	

Page eleven

		Number of starlings	Area of rough grass		
	Year	(millions)	farmland (hectares)		
	1970	3.6	1 300 000		
	1975	3.4	1 000 000		
	1980	3.2	700 000		
	1985	2.8	110 000		
	1990	2.3	100 000		
	1995	1.9	90 000		
		the table to answer the content of the table to answer the table to answer the content of the table to answer the content of the table to answer the table to answer the table to answer the content of the table to answer the table table to answer the table table to answer the		970	
				1	
(b)	Predict the number was 850 000 hectares	of starlings when the areas.	a of rough grass farml	and	
	was 850 000 hectares	s. millions		and 1	
Ciga	was 850 000 hectares	S.	mful to your health.		
Ciga	was 850 000 hectares	s millions s substances which are har	mful to your health.		
Ciga	was 850 000 hectares arette smoke containe Tick () the three h	s millions s substances which are har narmful substances in toba	mful to your health.		
Ciga	was 850 000 hectares arette smoke contains Tick () the three h	s. millions s substances which are har narmful substances in toba	mful to your health.	1	
Ciga (a)	was 850 000 hectares arette smoke contains Tick () the three has nicotine water vapour oxygen	s. millions s substances which are har narmful substances in toba	rmful to your health.		
Ciga (a)	was 850 000 hectares arette smoke contains Tick () the three has nicotine water vapour oxygen	s millions s substances which are har narmful substances in toba tar carbon monoxide nitrogen	rmful to your health.	1	
Ciga (a)	was 850 000 hectares arette smoke contains Tick () the three has nicotine water vapour oxygen Tick () two health	s	rmful to your health.	1	

Marks

2

2

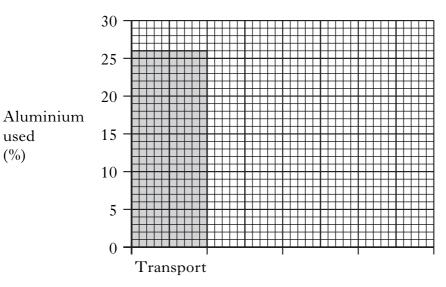
PS

19.	The transport industry is the biggest user of aluminium in the world. It
	uses 26% of the aluminium produced. 22% of the world's aluminium
	production is used by the packaging industry. The construction industry
	uses 20% of the aluminium produced, while the electrical engineering
	industry uses 9%.

(a) Use this information to complete the table below.

Industry	Aluminium used (%)

(b) Use this information to complete the bar graph.(Additional graph paper, if required, can be found on page 19.)



Industry

[Turn over

[3700/401]

Page thirteen

20 1		Marks	KU	PS
	a survey, pupils were asked how often they exercise. ne results are shown in the pie chart.			
	Every day Twice a week Once a week Don't exercise			
(<i>a</i>)	What percentage of pupils exercise every day?	1		
<i>(b)</i>	There were 60 pupils in the survey. How many pupils exercise twice a week? Space for working			
	Answer pupils	1		
[3700/40	Page fourteen			

21		Marks	KU	PS
21.	Susan compared the current that flo circuits shown below.	wed in different wires. She set up the		
1		2		
	battery)	battery		
	meter	meter		
	88:88	8888		
	copper wire	nichrome wire		
	10 cm long 4 mm thick	6 cm long 4 mm thick		
3	battery	4 battery		
	[Battery]	Datter y Ji		
,				
	meter 88:88	meter		
	copper wire	nichrome wire		
	6 cm long	10 cm long		
	2 mm thick	4 mm thick		
	(a) Susan wanted to find out if m	ore current flowed in copper wire or		
	nichrome wire.	ore current nowed in copper wire or		
	Which two circuits should she cl	hoose for a fair test?		
	Box numbers	and 1		
	(b) What was Susan trying to find or	ut if she compared circuits 2 and 4?		
		1		
		[Turn over		
[370	0/401] Pag	ge fifteen		

PS

KU

Marks

22	The box	below	shows	some	properties	of mate	rials
44.	I HE DOX	DCIOW	SHOWS	SOME	properties	or mate	niais.

thermal conductivity	electrical conductivity
strength	resistance to corrosion

Use the properties to complete the table below.

Material	Use of material	Property of material
Steel	Girders	
Copper	Wiring	
Bronze	Ship propellers	
Aluminium	Saucepan	

23. Match up each statement with the **correct** temperature.

One has been done for you.

A person with a fever	24 °C
A sunny day in Scotland	29°C
A person with hypothermia	37 °C
Normal body temperature	41 °C

2

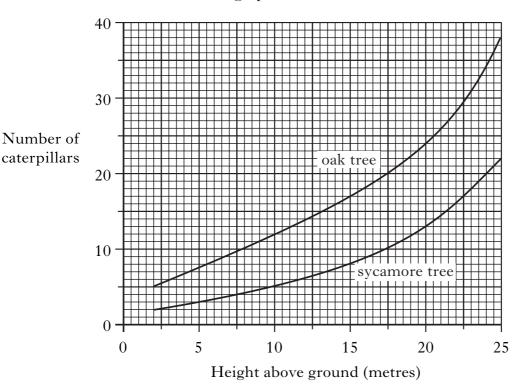
2

	WRIT THIS M	
Marks	KU	PS

	sycamore tree.							
24.	Students took samples	of leaves at	different h	neights f	from an	oak	tree	and

They recorded the number of caterpillars in each sample.

Their results are shown in the graph.



(a) How many caterpillars were found in the leaf sample from the oak tree at a height of 15 metres?

(b) In a leaf sample collected at a height of 24 metres, there are 20 caterpillars.

What **type of tree** did the sample come from?

.....

[Turn over

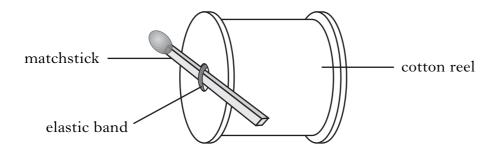
1

1

25.	Edward made a	model	tank	from	a	cotton	reel,	an	elastic	band	and	a	Marks	K
	matchstick.												Williams	



2



When he turned the matchstick and let go, the tank moved forward.

He investigated how far the tank travelled using different numbers of turns of the matchstick and different thicknesses of elastic band.

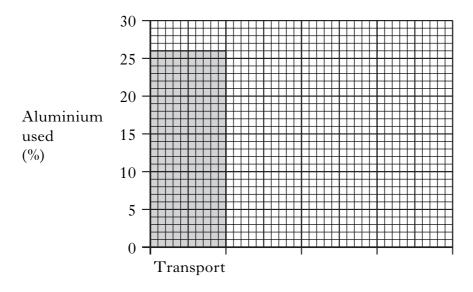
His results are shown below.

Number of turns of the matchstick	Thickness of elastic band	Distance travelled (cm)
5	thick	35
10	thick	69
15	thick	101
5	thin	23
10	thin	44
15	thin	69

Dra	w two conclusions from these results.	
1		
2		

 $[END\ OF\ QUESTION\ PAPER]$

ADDITIONAL GRAPH PAPER FOR USE IN QUESTION 19(b)



Industry

