GCSE Additional Science 1

Higher Tier

Unit 5H

SPECIMEN MARK SCHEME

Version 1.0

Quality of Written Communication and levels marking

In Question 6(b) candidates are required to produce extended written material in English, and will be assessed on the quality of their written communication as well as the standard of the scientific response.

Candidates will be required to:

- use good English
- organise information clearly
- use specialist vocabulary where appropriate.

The following general criteria should be used to assign marks to a level:

Level 1: basic

- Knowledge of basic information
- Simple understanding
- The answer is poorly organised, with almost no specialist terms and their use demonstrating a general lack of understanding of their meaning, little or no detail
- The spelling, punctuation and grammar are very weak.

Level 2: clear

- Knowledge of accurate information
- Clear understanding
- The answer has some structure and organisation, use of specialist terms has been attempted but not always accurately, some detail is given
- There is reasonable accuracy in spelling, punctuation and grammar, although there may still be some errors.

Level 3: detailed

- Knowledge of accurate information appropriately contextualised
- Detailed understanding, supported by relevant evidence and examples
- Answer is coherent and in an organised, logical sequence, containing a wide range of appropriate or relevant specialist terms used accurately.
- The answer shows almost faultless spelling, punctuation and grammar.

In order to attain a mark within a certain level, **both** the science **and** the QWC must be of a standard appropriate to that level.

COMPONENT NUMBER: AS1HP

COMPONENT NAME: GCSE Additional Science 1 Unit 5H

STATUS: Specimen V1.0

question	answers	extra information	mark
1(a)	**A** – cell membrane		1
	B – cytoplasm		1
	C – genes / genetic material / chromosome		1
	D – cell wall		1
Total			**4**

question	answers	extra information	mark
2	respiration		1
	production of fat or oil		1
	production of cellulose		1
	production of proteins		1
Total			**4**

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STATUS: Specimen V1.0

question	answers	extra information	mark
3(a)	area of strips **or** length of transects **or** number of transects		1
3(b)(i)	because squirrels are mobile and could be missed / counted twice		1
3(b)(ii)	numbers of larders observed likely to be lower than actual number since it is unlikely that all could be spotted if 5 m away **or** old larders no longer being used **or** squirrels moved on / died	do **not** accept squirrels share larders or squirrels have more than one larder	1 1
3(c)	(no) because the bars show the range of the number of squirrel larders in the different types of woodland because, although spruce woodlands have the larger ranges, some spruce woodlands will have very low numbers of larders		 1 1
Total			**6**

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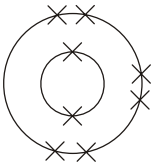
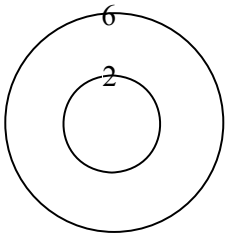
question	answers	extra information	mark
4(a)(i)	 **or** 		1
4(a)(ii)	nucleus		1
4(b)	it has **2** more neutrons **or** converse **or** O-16 has 8 neutrons (**1** mark) O-18 has 10 neutrons (**1** mark)		2
Total			**4**

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STATUS: Specimen V1.0

question	answers	extra information	mark
5(a)(i)	column		1
5(a)(ii)	mass spectrometer		1
5(b)(i)	165	if answer is not correct then evidence of correct working gains **one** mark eg (10x12) + 15 + 14 + 16	2
5(b)(ii)	10.37 (%)	accept 10 / 10.4 / 10.37..... if answer is not correct then evidence of correct working gains **one** mark eg minimum evidence would be 14/135	2
5(c)	any **two** from: • faster • more accurate • detects smaller amounts		2
5(d)	avoid bias improve reliability		1 1
Total			**10**

COMPONENT NUMBER: AS1HP

COMPONENT NAME: GCSE Additional Science 1 Unit 5H

STATUS: Specimen V1.0

question	answers	extra information	mark
6(a)(i)	4.5	allow **1** mark for correct substitution ie 9 ÷ 2	2
	m/s^2	mark independently	1

6(a)(ii)	speed		1

6(b)

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 2.

0 marks	Level 1 (1-2 marks)	Level 2 (3-4 marks)	Level 3 (5-6 marks)
No relevant content.	There is a brief description of the performance of the running shoes on the three surfaces.	There is some description of the performance of the running shoes on the three surfaces.	There is a clear, balanced and detailed description of the performance of the running shoes on the three surfaces.

examples of the physics points made in the response	extra information
• the lower the impact the better (performance) • make B better / lower impact on polyurethene • make C better / lower impact on acrylic • make B better / lower impact on grass • make B best overall / make A worst overall • little difference in performance of make C on all surfaces	

Total			**10**

COMPONENT NUMBER: AS1HP

COMPONENT NAME: GCSE Additional Science 1 Unit 5H

STATUS: Specimen V1.0

question	answers	extra information	mark
7(a)(i)	the thicker the tile, the greater the (fall) height		1
7(a)(ii)	60 (mm)	accept any number or range between 60 and 85 inclusive if units are given must match range	1
	(minimum thickness) needed to reduce risk of injury		1
7(b)(i)	the time taken to stop		1
7(b)(ii)	the force on		1
Total			**5**

question	answers	extra information	mark
8	muscular tissue	do **not** accept functions that do not match tissues, eg 'muscular tissue to produce digestive juices'	1
	to churn the contents		1
	glandular tissue		1
	to produce digestive juices		1
	epithelial tissue		1
	to cover the outside / inside of the stomach		1
Total			**6**

COMPONENT NUMBER: AS1HP

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STATUS: Specimen V1.0

question	answers	extra information	mark
9(a)	((mean) mass) increases up to 7 / 8 units (of light) then levels off light limiting factor up to 7 / 8 units for photosynthesis other factor / temperature limiting above 7 / 8 units		1 1 1 1
9(b)(i)	low in winter / named months / when the days are short high in summer / named month(s) / when days are long reasonable quantitative statement	higher in summer than in winter for **2** marks **but** 8/11 times higher in summer than in winter for **3** marks	1 1 1
9(b)(ii)	no artificial light given in summer / light only given in winter since natural light greatly exceeds minimum / 600 J (required to produce tomatoes) **or** light only given in winter (**1** mark) as natural light less than the minimum needed (to grow them) or 600 J (**1** mark) **or** for **2** marks: percentage increase in growth from artificial light only significant in winter		1 1
Total			**9**

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STATUS: Specimen V1.0

question	answers	extra information	mark
10(a)	one nitrogen atom joined to three hydrogen atoms		1
	correct pairs of electrons		1
10(b)	because ammonia is made of small molecules / simple molecules / simple molecular structures		1
	and so there are weak forces between the molecules **or** and so the intermolecular forces are weak		1
		incomplete answers that link only size of molecule or strength of intermolecular forces with boiling point only gain **1** mark	
Total			**4**

question	answers	extra information	mark
11	• the layers / atoms can slide over each other		1
	• because there are only weak / intermolecular forces (of attraction) / bonds between layers		1
	• graphite conducts electricity because the electrons are delocalised **or** electrons free		1
	• this is because each carbon / atom is joined / bonded to three other carbon / atoms **or** each carbon forms 3 bonds / one electron on each carbon is not used for bonding		1
Total			**4**

COMPONENT NUMBER: AS1HP

COMPONENT NAME: GCSE Additional Science 1 Unit 5H

STATUS: Specimen V1.0

question	answers	extra information	mark
12	heat then mould / extrude into a new shape / object plastic made of polymer chains that can move (when heated) because plastic / polymer has weak intermolecular forces		1 1 1 1
Total			**4**

question	answers	extra information	mark
13(a)	130.4	accept 130 to 130.43478…… correct answer gains two marks with or without working an answer of 131 would gain **one** mark. if answer is not correct then: moles of salicylic acid = 0.7 ……. (1 mark) **or** mass of aspirin = moles of salicylic acid x 180 (1 mark) **or** 100 x (180/138) (1 mark)	2
13(b)	62.5%	accept 63% correct answer gains two marks with or without working if answer is not correct then: 250/400 x 100 (1 mark)	2
Total			**4**

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STATUS: Specimen V1.0

question	answers	extra information	mark
14(a)	1.25	allow **1** mark for correct resultant force ie 1500 N allow **2** marks for correct transformation and substitution ie $\frac{1500}{1200}$ allow **1** mark for a correct transformation but clearly substituting an incorrect value for force eg = $\frac{3500}{1200}$	3
	m/s^2		1
14(b)	as speed increases so does the size of the drag force	accept frictional force / resistive force / air resistance for drag	1
	eventually the drag force becomes equal to the thrust		1
	the resultant force is now equal to zero and therefore there is no further acceleration		1

Question 14 continues on the next page. . .

Question 14 continued . . .

14(c)	the car and van will reach top speed when the forward force equals the drag force	accept air resistance / frictional / resistive force for drag force	1
	the drag force at any speed is smaller for the car than for the van		1
	as the car is more streamlined		1
	therefore the car's drag force will equal the forward force at a higher speed	allow converse throughout	1
Total			**11**

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STATUS: Specimen V1.0

question	answers	extra information	mark
15(a)	35 (m)	allow **1** mark for indicating the correct area allow **1** mark for obtaining correct figures from the graph allow **1** mark for calculating area of triangle (25) but omitting the rectangle underneath (2 x 5)	3
15(b)	86 400	allow **1** mark for correct substitution into the correct equation ie $1/2 \times 1200 \times 12^2$	2
Total			**5**