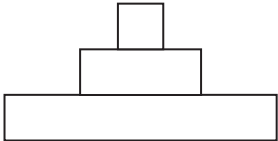


Tier 3–6 5–7	Q No 9 1			
Part	Mark	Answer	Accept	Additional guidance
a 2/2h	1	* 9		
b i 2/2h	1	any one from * it protects the baby * it helps to maintain a constant temperature * it allows the baby to move	accept 'it keeps it safe' accept 'it keeps the baby warm' accept 'it absorbs shocks' accept 'it protects against infection or disease'	
b ii 2/2h	1	* muscles contract	accept 'contractions'	'the uterus or it contracts' is insufficient
c 2/2h	1	any one from * (through the) placenta * (through the) umbilical cord * (from the) mother's blood		ignore references to food 'through the blood' is insufficient 'it gets everything from the mother' is insufficient <i>do not accept</i> 'the mother breathes for the child'
d 2/2i	1	* alveolus		'air sac' is insufficient
Total	5			

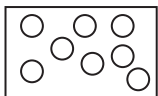

Tier 3–6 5–7	Q No 10 2			
Part	Mark	Answer	Accept	Additional guidance
a 2/5e	1	*  fox partridge plant		answers must be in the correct order all three answers are required for the mark
b 2/5f	1	* fewer foxes or they decrease any one from * fewer partridges (for foxes to eat) * the poison gets into the food chain * they move elsewhere to find food	accept 'there would be less' accept 'they would drop or go down' accept 'less food' accept 'partridges would be poisoned' accept 'some die of starvation'	both the answer and the correct explanation are required for the mark credit both correct answers written in the same space 'foxes die' is insufficient <i>do not accept</i> 'the chemicals poison the foxes' <i>do not accept</i> 'they all die of starvation' <i>do not accept</i> 'they have nothing to eat'
c 2/5d	1	any one from * greater chance of survival * more would survive	accept 'the more eggs they lay the more partridges there will be' accept 'some eggs will be damaged or eaten' accept 'some eggs will not hatch' accept 'young partridges or chicks may be eaten or trampled on or die' accept 'so they will not become extinct or die out'	'partridges will die' is insufficient

Tier 3–6 5–7	Q No 10 2			
Part	Mark	Answer	Accept	Additional guidance
d 2/5a	2	any two from * there would be a greater variety of plants * more plants or weeds * more insects * more nesting places * more cover * the partridges are not poisoned	accept 'there would be plants to eat' accept 'there would be insects to eat' accept 'protection from predators' accept 'more food' or 'they would have food' or 'partridges will come to feed' if none of the first three marking points are given	do not accept 'they had not been sprayed with chemicals'
Total	5			

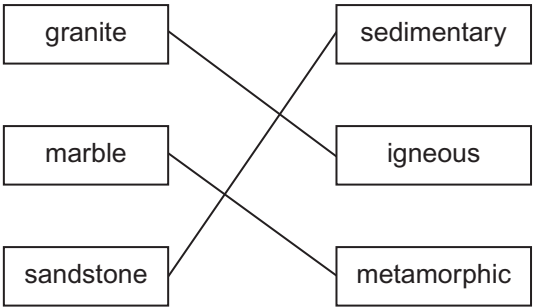
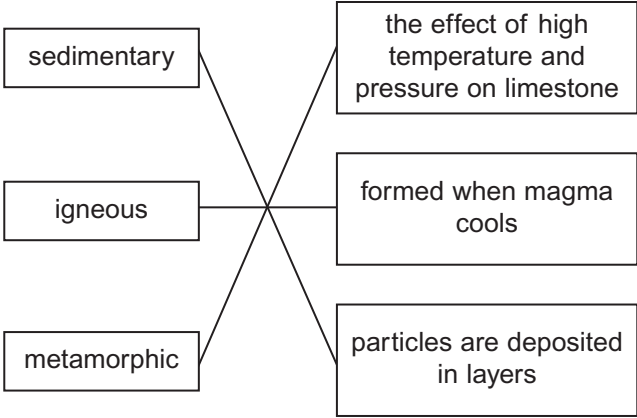
Tier 3–6 5–7	Q No 11 3	Part	Mark	Answer	Accept	Additional guidance
		a 1/2a	2	any two from * he used the same amount of pollen * he measured the concentration of the solutions or he used a range of strengths of solution * he observed the pollen grains after one hour * he worked out the percentage which germinated	accept 'he used the same number of pollen grains' or 'he controlled the number of pollen grains' accept 'he has given percentages' accept 'he used a range of sugar solutions' accept 'he used exact amounts' accept 'he looked at them after one hour' or 'he kept the time the same' accept 'more detail' or 'more precise'	'more accurate' is insufficient 'it is a fair test' is insufficient accept answers formulated in terms of what Amy's plan does not do
		b 1/2d	1	* the concentration of sugar solution	accept 'strength of solution' accept 'different sugar solutions' accept 'the sugar solution' accept 'the amount or percentage of sugar'	<i>do not accept</i> 'the amount of sugar solution'
		c 1/2i	1	* a point at (20,10) plotted to \pm half a small square		

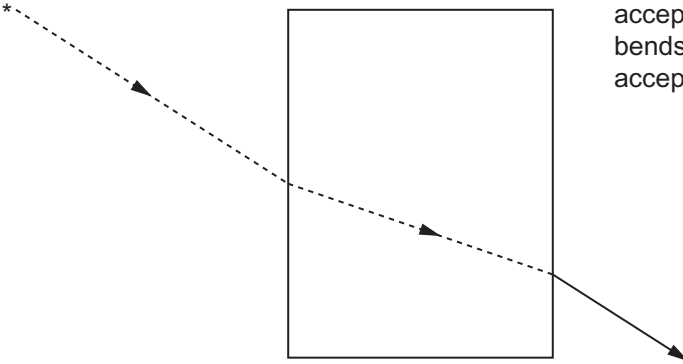
Tier 3–6 5–7	Q No 11 3			
Part	Mark	Answer	Accept	Additional guidance
d 1/2o	1	<p>* no ✓ because the germination rate decreases after the concentration is 10%</p> <p>or</p> <p>* yes ✓ because the germination rate increases up to 10% sugar solution (but then starts to fall)</p>	<p>accept 'because the results go down'</p> <p>accept 'because the graph shows a peak or does not continue to rise'</p> <p>accept 'it only rises up to 10% or at first'</p>	<p><i>do not accept</i> for either 'yes' or 'no' reading off one point in the chart if both boxes are ticked, award no mark</p> <p>if both boxes are ticked, award no mark <i>do not accept</i> 'the greater the concentration the fewer grains germinated'</p> <p>(if both boxes are ticked and the reason given explains why both could be correct, a mark may be awarded)</p>
Total	5			

Tier 3–6 5–7	Q No 12 4			
Part	Mark	Answer	Accept	Additional guidance
a i 3/3a	1 1	* oxygen * water		answers may be in either order 'air' is insufficient 'moisture' or 'dampness' or 'wet' are insufficient
a ii 3/3a	1	any one from * it prevents contact between the steel or the car and oxygen or water * it is waterproof or water runs off	accept 'it prevents air getting to the car' accept 'wax fills scratches or chips where paint is damaged'	'it forms a protective layer' is insufficient
a iii 3/3a	1	any one from * paint * chrome	accept 'they are coated in zinc' or 'they are galvanised' accept 'polish'	'rust treatment' is insufficient 'cover it' is insufficient
b 3/3g	1	* acid rain	accept 'sulphur dioxide' accept 'oxides of nitrogen' accept 'car exhaust fumes' accept 'burning fossil fuels' accept 'sea air' or 'salty air' or 'salt'	'carbon dioxide' is insufficient

Tier 3–6 5–7	Q No 12 4			
Part	Mark	Answer	Accept	Additional guidance
c i 3/1b	1	* <i>gas</i> : particles randomly arranged and most not touching 	accept black shaded circles if drawn correctly accept fewer or more than 8 circles if the arrangement is clear	ignore arrows attached to circles
c ii 3/1b	1	* <i>solid</i> : particles regularly arranged and all touching 	accept white circles if drawn correctly accept 2 rows of particles with at least 2 particles in the second row accept fewer or more than 8 circles if a regular arrangement is clear	ignore location of circles in box <i>do not accept</i> a single row of circles
Total	7			

Tier 3–6 5–7	Q No 13 5			
Part	Mark	Answer	Accept	Additional guidance
a 1/2m 3/2e	1	any one from * it absorbed water * its mass or weight increased	accept 'it soaks up water' accept 'the mass or weight of the granite or marble did not increase or change'	'granite or marble did not change' is insufficient
b i 3/2d	1	any one from * it would crack * it would crumble or break up	accept 'the grains would move apart'	
b ii 3/2d	1	* weathering	accept 'freeze-thaw' accept 'erosion'	
c 3/3g	1	any one from * granite would not react with acid rain * marble reacts with acid rain	accept 'granite or it is not affected by acid rain or acid' accept 'granite would not erode or crumble or corrode' accept 'marble is affected by acid rain or rain' accept 'marble would erode' accept 'rain or pollution might have acid in it'	'granite does not react with air pollution' is insufficient <i>do not accept</i> 'it would erode'

Tier 3–6 5–7	Q No 13 5		
Part	Mark	Answer	Accept Additional guidance
d i 3/2f	2	<p>* </p>	<p>if all three lines are correct, award two marks if one or two lines are correct, award one mark if more than one line is drawn from a name of a rock, do not credit that line</p>
d ii 3/2f	2	<p>* </p>	<p>if all three lines are correct, award two marks if one or two lines are correct, award one mark if more than one line is drawn from a group of rocks, do not credit that line</p>
Total	8		

Tier 3–6 5–7	Q No 14 6			
Part	Mark	Answer	Accept	Additional guidance
a 4/3c	1	* 65 it is different from the angle of incidence or all the others are the same	accept 'number 4' or 'the fourth' accept 'it is not 60°' or 'it should be 60°' accept 'the angle of reflection and the angle of incidence should be the same' accept 'it is 5° out' accept 'they are not the same'	both the answer and the correct explanation are required for the mark award a mark for '60' if the explanation is correct 'they go up in tens' is insufficient 'it does not fit the pattern' is insufficient
b i 4/3d	1	* a number from 30 to 32		
b ii 4/3d	1	* greater than	accept 'greater' or 'bigger'	
c 4/3d	1		accept a continuous straight line that bends away from the normal accept a line without an arrow	the ray need not be parallel to the incident ray
Total	4			

Tier 3–6 5–7	Q No 15 7			
Part	Mark	Answer	Accept	Additional guidance
a 4/4b	1 1	* X: the Sun * Y: Mercury		
b 4/4c	2	any two from * it has a longer orbit * it is further from the Sun * the Sun's gravity is less * it is slower	accept 'it has a bigger orbit' accept 'it has a greater distance to cover' accept 'it is further out' accept 'Mars is closer to the Sun' accept 'there is a smaller gravitational pull on it'	'it is further away' or 'it is further' are insufficient
c i 4/4c	1	any one from * the orbit times were the same * it came at regular intervals * they saw it every 76 years	accept 'he took 1531 from 1607 and 1607 from 1683'	
c ii 1/2k 4/4c	1	* 2062		
Total	6			

Tier 3–6 5–7	Q No 16 8			
Part	Mark	Answer	Accept	Additional guidance
a 4/1f	1	* both picked up the same number or four paper-clips	accept 'they both picked up the same number' accept 'same amount of paper-clips' accept 'there were 5 out of 9 paper-clips left for both' accept 'the same mass of paper-clips'	'they hold the same clips' is insufficient
b 4/1f	1	any one from * it does not stay magnetised * it can be turned off * objects do not stay attracted to it * iron loses its magnetism * steel stays magnetised	accept 'you cannot turn steel off'	

Tier 3–6 5–7	Q No 16 8			
Part	Mark	Answer	Accept	Additional guidance
c i 1/2j 4/1f	1	any one from * the greater the distance the lower the reading * the further away the smaller the reading	accept the converse accept 'at big distances the field is weaker' or the converse accept 'at 50 mm the reading is lower' accept the converse	<i>do not accept</i> 'the bigger the distance the smaller the amps or current'
c ii 1/2j 4/1f	1	* the greater the current the stronger the electromagnet		
c iii 4/1f	1	any one from * change the number of turns * change the thickness of the wire * change the diameter of the core	accept 'use more coils' accept 'use fewer or less coils' accept 'put the coils closer together' or the converse accept 'change the metal of the coils' accept 'use a different sized core' accept 'use nickel or cobalt core' accept 'use a different core'	'use bigger coils' is insufficient 'use more wire' is insufficient <i>do not accept</i> 'add more batteries'
Total	5			

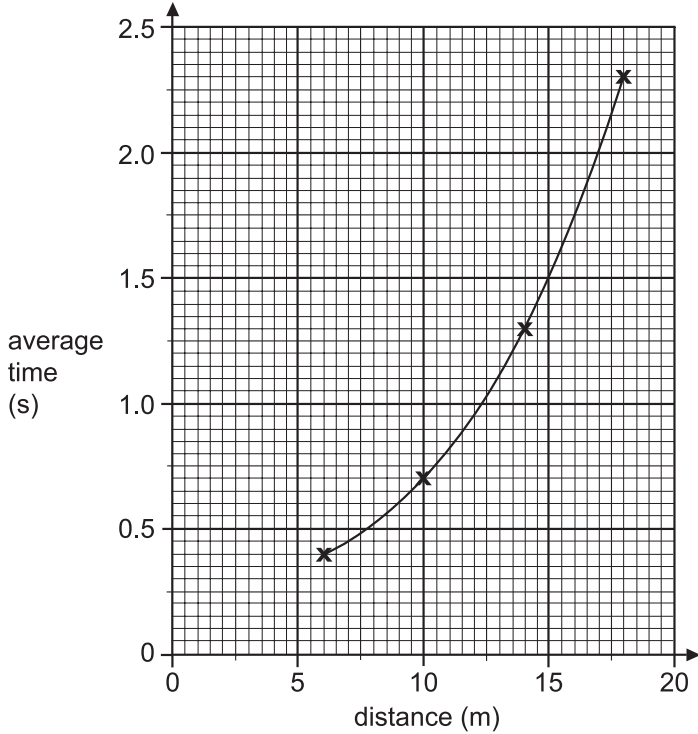
Tier 5–7	Q No 9			
Part	Mark	Answer	Accept	Additional guidance
a i 2/4a	1	* genes or DNA or chromosomes		'in the nucleus' is insufficient
	1	* in gametes or sex cells or eggs or sperm	accept 'at fertilisation'	
a ii 2/4a	1	* they have genes or DNA or chromosomes from both parents	accept 'they have genetic information from both parents' accept 'from eggs and sperm'	
b 2/4a	1	* they have the same genetic information or genes or DNA or chromosomes	accept 'they are from the same egg and same sperm' accept 'the fertilised egg or zygote split in two' accept 'they are from the same fertilised egg'	'from the same egg' or 'from the same sperm' is insufficient accept references to the egg dividing if the answer makes clear that this is after fertilisation eg 'the egg divides after it has joined with a sperm' 'the egg divides in the uterus' is insufficient
c 2/4a	1	any one from * eye colour is inherited or controlled by genes * eye colour is not affected by environmental factors		answers must refer to both weight and skin colour 'weight and skin colour are not controlled by genes' is insufficient
	1	any one from * weight and skin colour are affected by environmental factors * weight is affected by diet or exercise and skin colour by the Sun	accept 'weight and skin colour are not just controlled by genes'	
Total	6			

Tier 5–7	Q No 10	Answer	Accept	Additional guidance
a 2/1e 2/2i	2	any two from * mucus will build up * airways will be (partially) blocked * coughing * lungs can become infected or bacteria are not removed * particles or dust are not removed	accept 'cilia cannot move' accept 'narrower airways' or named part of the airway accept 'breathing will be more difficult'	'cilia do not work as well' is insufficient <i>do not accept</i> 'lungs will be blocked'
b 2/2m	2	any two from * reduction in nicotine * she gets used to less nicotine * the patch or it provides her with nicotine so she does not need to smoke * it provides her with less nicotine than a cigarette	accept 'mass of nicotine goes down' accept 'it reduces the craving' or 'it reduces the amount she needs'	
c i 3/1e	1	* the elements are combined or joined or bonded	accept 'the atoms are joined' accept 'it has a definite composition'	'it has three elements' is insufficient as it is given in the question
c ii 3/1e	2	any two from * carbon dioxide * water * carbon monoxide	accept 'CO ₂ ' accept 'hydrogen oxide' or 'steam' or 'H ₂ O' accept 'CO' accept 'carbon oxide' if neither 'carbon dioxide' nor 'carbon monoxide' is given	
Total	7			

Tier 5–7	Q No 11			
Part	Mark	Answer	Accept	Additional guidance
a i 1/2j 3/2b	2	<p>any two from</p> <ul style="list-style-type: none"> * (the solubility of) potassium chloride and sodium chloride increase * the difference is smaller at low temperatures or greater at higher temperatures * at lower temperatures potassium chloride is less soluble than sodium chloride or at high temperatures potassium chloride is more soluble than sodium chloride * sodium chloride changes less than potassium chloride <p>* at 25°C they are equally soluble</p>	<p>accept 'they both increase'</p> <p>accept the converse</p> <p>accept 'the line for potassium chloride is steeper' or 'the line for sodium chloride is flatter'</p> <p>accept 'sodium chloride is affected less' or 'potassium chloride is affected more'</p> <p>accept 'sodium chloride hardly changes but potassium chloride increases'</p> <p>accept 'between 23°C and 27°C they are the same'</p> <p>accept, for one mark, an answer stating the solubility of both salts at a given temperature other than 25°C</p> <p>accept for two marks 'the solubility of potassium chloride increases more than sodium chloride' or 'sodium chloride increases less than potassium chloride'</p>	<p>ignore references to calcium sulphate</p>

Tier 5–7	Q No 11			
Part	Mark	Answer	Accept	Additional guidance
a ii 3/2b	1	any one from * crystals or solid or particles would appear * potassium chloride (would be precipitated)	accept 'it goes cloudy or white'	
	1	any one from * cooler water cannot dissolve as much potassium chloride * solubility is less at a lower temperature * the solubility decreases	accept 'less dissolves' or 'at 90°C more dissolves'	
b i 3/2b	1	any one from * above 25°C sodium chloride is deposited before potassium chloride * below 25°C potassium chloride would be deposited before sodium chloride * below 25°C the order would be calcium sulphate, potassium chloride, sodium chloride * calcium sulphate is the least soluble followed by sodium chloride and then potassium chloride	accept 'below 25°C there would be a different order' accept 'because of the order in which they fell' accept 'below 25°C sodium chloride would be above potassium chloride' accept 'below 25°C sodium chloride would be at the top' accept 'the least soluble was deposited first'	
	1	* sodium chloride potassium chloride calcium sulphate	accept 'sodium' accept 'potassium' accept 'calcium'	answers must be in the correct order all three answers are required for the mark
Total	6			

Tier 5–7	Q No 12			
Part	Mark	Answer	Accept	Additional guidance
a <i>1/2n</i>	1	any one from * variation in the way the person acts * variation in the way the toy works * variation in external conditions	accept 'he might not fire it so hard each time' accept 'human reaction time starting and stopping the stopwatch' accept 'less air in the toy' accept 'draught' accept 'the wind has affected it'	'the timer is not accurate' is insufficient
b <i>1/2i</i>	1	any one from * time is the dependent variable * distance is the independent variable in this case	accept 'time is being tested' accept 'time is being measured' accept 'we chose the distance to use' accept 'we are changing the distance' accept 'we fixed or controlled the distance'	'time is the thing that changes' is insufficient 'because time is the axis that is changing' is insufficient

Tier 5–7	Q No 12			
Part	Mark	Answer	Accept	Additional guidance
c i 1/2i	1	<p>* all four points must be plotted to + or – one small square</p> 		
c ii 1/2j	1	* a smooth curve of best fit		the graph need not go through the origin
d 1/2k	1	* The pulse of air slows down as it travels. ✓		if more than one box is ticked, award no mark
Total	5			

Tier 5–7	Q No 13			
Part	Mark	Answer	Accept	Additional guidance
a 4/2a	1	* 960 000	accept ' $\frac{192\ 000\ 000}{200}$ '	
	1	* km/day or kilometres per day or km day ⁻¹	accept '40 000 km/hr' for two marks accept '11.1 km/s' for two marks accept '11 111 m/s' for two marks accept 'd' for 'day' and 'h' for 'hour'	<i>do not accept</i> 'km pday'
b 4/2b	1	* gravity on Mars is less	accept 'gravity is greater on Earth'	
c 4/4b	1	any one from * Mars is further from the Sun * less light reaches Mars	accept 'the Sun is closer to the Earth' accept 'the light rays have spread out more'	'Mars is further away' is insufficient <i>do not accept</i> 'less heat reaches Mars'
d 4/2g	1	* 1600	accept '40/0.025'	
	1	* N/m ² or Pa or Nm ⁻²	accept 'pascals'	<i>do not accept</i> lower case 'n'
Total	6			