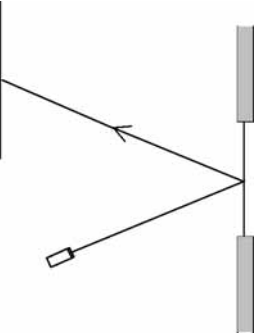


Part	Mark	Answer	Accept	Additional guidance
Tier 3–6 5–7	Q No 10 1			
a 4/3c	1 1	* the angles of incidence and reflection must be equal * the ray must be continuous and straight with an arrow in the correct direction	accept one arrow in the correct direction on either the incident or the reflected ray	the ray must hit the screen in the middle 2 cm
				
b i 4/3g	1	any one from * sound waves travel to the window or glass * vibrations pass through the air * sound waves or vibrations hit the window	accept 'sound travels to the window' accept 'sound hits the window'	
b ii 4/3c	1	* the beam will vibrate or move or jump about	accept 'scatter' for vibrate accept 'it would go to other places in the room' accept 'it would go in different directions' accept 'it shakes' or 'it wobbles'	<i>do not accept</i> 'it is blurred' 'it goes in a different direction' is insufficient
c 4/3j 4/3k	1	* B ✓		if more than one box is ticked, award no mark
Total	5			

Tier	Q No			
3–6	11			
5–7	2			
Part	Mark	Answer	Accept	Additional guidance
a 4/2b 4/1d	1 1	* gravity * magnetic force or magnetism	accept 'weight' accept 'repulsion' or 'upthrust'	answers may be in either order <i>do not accept</i> 'air resistance'
b i 1/2j	1	* 12		
b ii 1/2k	1	any one from * the paper cup stopped moving * the paper cup reached the bottom magnet	accept 'it hit the bottom' accept 'the paper cup could not go any further'	
c 4/1d 3/1d	1	any one from * iron is magnetic * iron nails are attracted to a magnet * there is a magnetic force on the iron	accept 'aluminium is not magnetic' accept 'the rivets are not attracted to a magnet'	<i>do not accept</i> 'aluminium or rivets are less magnetic' <i>do not accept</i> 'iron or nails are more magnetic than aluminium or rivets'
Total	5			

Part	Mark	Answer	Accept	Additional guidance				
<table border="1"> <tr> <td>Tier 3–6</td> <td>Q No 12</td> </tr> <tr> <td>5–7</td> <td>3</td> </tr> </table>		Tier 3–6	Q No 12	5–7	3			
Tier 3–6	Q No 12							
5–7	3							
a 1/2d	2	<ul style="list-style-type: none"> any two from * initial temperature of water * exclusion of draughts * volume or mass of water * surface area (of water) * humidity 	<ul style="list-style-type: none"> accept 'same amount of draughts' accept 'amount of water' accept 'shape or size or material of container' accept 'the time it is left for' 	'temperature' is insufficient do not accept 'size of room'				
b 1/2o	1	<ul style="list-style-type: none"> * they have not collected data about temperature * no data recorded about temperature 	<ul style="list-style-type: none"> accept 'they did not measure temperature' accept 'no information about temperature' accept 'no temperature' 					
c 1/2p	1	<ul style="list-style-type: none"> * the line is not straight (converse) * the line should be straight 	<ul style="list-style-type: none"> accept 'the line is zig-zag' accept 'they joined up all the points' accept 'they didn't go between the points' accept 'the line does not need to go through all the points' 					
d 1/2i	1	* 6 points correctly plotted to the nearest half square						
e 1/2i	1	* a straight line of best fit between some of the points						

Tier	Q No			
3–6	12			
5–7	3			
Part	Mark	Answer	Accept	Additional guidance
f 1/2k	1	<input type="checkbox"/> <input checked="" type="checkbox"/> room 2 and * the points for room 2 are lower than room 1 * the container in room 2 reaches 30g in 5 days, room 1 reaches 45g * more water evaporated in the same time * the volume goes down more quickly	accept 'there is less water in the container in room 2 than in room 1' accept 'amount of water dropped more in the first three days' accept 'the line for room 2 is steeper' accept 'the numbers go down more quickly' accept 'the mass goes down more quickly'	
Total	7			

Part	Mark	Answer	Accept	Additional guidance
Tier 3–6 5–7	Q No 13 4			
a i 3/3d	1	* red or pink	accept 'orange' or 'yellow'	
a ii 3/3d	1	* any number greater than 0 and smaller than 7	accept '0'	
b i 3/3e	1	* carbon dioxide is gas	accept 'carbon dioxide or a gas is produced'	
b ii 3/3f	1	any one from * no more carbon dioxide or gas was produced * the reaction stopped * all the hydrochloric acid was used up * there was an excess of magnesium carbonate or carbonate	accept 'the acid had been neutralised'	<i>do not accept</i> 'all the magnesium carbonate was used up'
c 3/1e 3/3e	1 1	* a compound ✓ * a salt ✓		if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero
d 2/2b	1	any one from * without it digestion would stop or slow down * acid is needed for digestion * the enzymes only work in acid conditions or at a low pH * it is needed to kill bacteria or microbes	accept 'to break down food'	<i>do not accept</i> 'germs'
Total	7			

Tier	Q No		
3–6	14		
5–7	5		
Part	Mark	Answer	Additional guidance
a i 2/4b	1	* vertebrates	<i>do not accept</i> 'vertebrae'
a ii 2/4b	1	* reptiles	
b 2/2e	1	any one from * so that it can bend * to allow movement	
c 2/2e	1	any one from * to stop the bones rubbing together * to stop bones getting worn down * to cushion the bones	accept 'it reduces friction' accept 'it can be squashed' accept 'it absorbs shock'
d 2/2e	1	* <i>the biceps</i> contracts <i>the triceps</i> relaxes	both answers are required for the mark
Total	5		

Part	Mark	Answer	Accept	Additional guidance
Tier 3–6 5–7	Q No 15 6			
a <i>1/2h</i>	1	any one from * a bigger sample * more data are collected in the survey	accept 'one person could make it up' accept 'one garden may not be typical'	
b <i>1/2d</i>	2	any two from * time of year or season * location or gardens * duration of the observation	accept 'the time' for one mark if 'time of year' or 'season' or 'duration' is not given	'the environment' is insufficient
c i <i>1/2e</i>	1	any one from * they would need to look at the pattern in the data for more than a year * they would need to compare data collected in another year with that available in 2002	accept 'data from another year or last year' accept 'more data or data from the time when his grandad was young' accept 'data from when his grandad was young is not available'	
c ii <i>1/1b</i>	1	* data would need to show fewer sparrows in 2002 than in earlier years	accept 'more sparrows would need to be recorded in earlier years than in 2002'	
Total	5			

Tier 3–6 5–7	Q No 16 7			
Part	Mark	Answer	Accept	Additional guidance
a i 2/1b	1	* C and E		answers may be in any order both answers are required for the mark
a ii 2/1b	1	* C		
a iii 2/1b	1	any one from * to trap or absorb light * photosynthesis	accept 'to make glucose or sugar or starch or carbohydrate or food'	
b i 2/1c	1	* A		
b ii 2/1c	1	any one from * windpipe * trachea * airways * bronchus * bronchiole * oviduct or fallopian tube	accept 'lungs'	
b iii 2/1e	1	* to remove mucus	accept 'to remove bacteria' accept 'to move mucus along' accept 'to move or remove bacteria or dust particles' accept 'to move an ovum or egg along' if the oviduct or fallopian tube is given as the answer to part ii	'it is a self cleaning mechanism' is insufficient do not accept 'they clean dust or bacteria out of the lungs'
c 2/1c	1	* B		
Total	7			

Tier 3–6 5–7	Q No 17 8			
Part	Mark	Answer	Accept	Additional guidance
a 1/1c	1	* He observed the environment. ✓		if more than one box is ticked, award no mark
b 1/1c	1	any one from * data from further away can be collected * data from fainter objects or smaller details can be collected * data is clearer because there is no atmospheric distortion * more information is collected * more detailed or more accurate information * wider spectrum of information including photographs or pictures of planet * other radiation can be detected	accept 'equipment can land on the planet' accept 'telescopes can be sited outside Earth's atmosphere'	a mark may be awarded for a description of a specific way information is different or a description of a specific way previous limitations are reduced
c 1/1a	1	any one from * our knowledge is increasing * our knowledge is changing	accept 'we probably do not know everything about the solar system'	
d 1/1c	1	any one from * new evidence which challenges ideas may be collected * there might be a new way of thinking about how the facts fit together * new interpretations of evidence * old ideas do not explain the observation	accept 'more observations' accept 'new evidence' accept 'old ideas do not work or fit data'	
Total	4			

Tier 5–7	Q No 9			
Part	Mark	Answer	Accept	Additional guidance
a i 4/2a	1	* 12.5 m/s	accept ' $\frac{400}{32}$ m/s' accept 'metres per second' or 'ms ⁻¹ ' for m/s	the unit is required for the mark <i>do not accept</i> 'mps'
a ii 4/2c	1	* they are equal or the same	accept 'they are balanced'	
b 4/2d 4/2c	1 1	* the forward force is greater than the backward force any one from * because air resistance or drag is smaller or reduced * because there is a smaller surface area	accept the converse accept 'the forward force is greater' or 'the backward force is smaller' accept 'less friction'	<i>do not accept</i> 'the forward force becomes greater or increases' 'she is more streamlined' is insufficient as it is given in the question
Total	4			

Tier 5–7		Q No 10		
Part	Mark	Answer	Accept	Additional guidance
a i 4/4a	1	any one from * the Earth rotates	accept 'the Sun appears to move across the sky' accept 'the Sun is in a different position at different times of day' accept 'different cloud cover'	<i>do not accept</i> 'in the middle of the day the Sun is hottest or brightest'
		* the amount of sunlight varies * the angle of the Sun varies	accept 'in the middle of the day the energy received is greatest'	
a ii 1/2j	1	* 6.0	accept any number from 5.8 to 6.2	
b i 4/4a	1	* a graph starting after 6 am and ending before 6 pm		
	1	* a line below the existing line and flat or reaching a maximum between 12 noon and 1 pm		
b ii 1/2k	1	* 15	accept ' $\frac{180}{12}$ '	
Total	5			

Tier 5–7	Q No 11			
Part	Mark	Answer	Accept	Additional guidance
a 1/2i	1	* volume or alkali in cm ³ on the x axis and pH of mixture on the y axis		pupils can gain credit for correct responses to other parts if the axes are wrongly labelled this mark cannot be awarded for a non-linear scale <i>do not accept</i> a line drawn from point to point
	1	* appropriate scales for volume of alkali and pH of mixture		
	1	* 11 points correctly plotted		
	1	* smooth curve of best fit		
b 1/2j	1	* 9.0	accept '9'	
Total	5			

Tier 5–7	Q No 12			
Part	Mark	Answer	Accept	Additional guidance
a 3/1c	1	* <i>magnesium</i> : Mg		
	1	* <i>copper</i> : Cu		
b i 3/3c	1	* copper		
b ii 3/3c	1	* 0	accept 'almost zero' or 'very small'	
	1	any one from * two blocks of the same metal have the same reactivity * there is no difference in reactivity	accept 'they are the same'	
b iii 3/3c	1	* nickel <i>and</i> tin		answers may be in either order both answers are required for the mark
Total	6			

Tier 5–7		Q No 13		
Part	Mark	Answer	Accept	Additional guidance
a i 2/2d	1	* football requires more energy than bowling	accept 'football is more energetic' accept 'you run more in football' accept 'she is using up more kJ' accept 'playing football uses 2260 kJ/hr and bowling uses 1030 kJ/hr'	<i>do not accept</i> 'football is energetic'
a ii 2/2m	2	any two from * alcohol increases the reaction time * alcohol reduces co-ordination * alcohol causes or increases errors of judgement * alcohol reduces concentration	accept 'it slows reactions' or 'it slows the reaction time' accept 'they would feel dizzy' accept 'they would be sleepy or drowsy' accept 'alcohol makes them lose more heat' accept 'it causes blurred vision'	'it slows them down' is insufficient
b 2/2b 2/2c	1	any one from * glucose can be absorbed * starch molecules cannot be absorbed * it takes time for starch to be broken down * starch has to be digested or broken down	accept 'glucose does not need to be digested'	
Total	4			

Tier 5–7		Q No 14		
Part	Mark	Answer	Accept	Additional guidance
a <i>1/2d</i>	1	* the size or area or dimensions of the plots	accept 'the amount of land'	
b <i>1/2h</i>	1	any one from * to increase the reliability of the results * to be more certain of his results	accept 'to make the results more accurate' accept 'some of the plots could be unusual or different'	'to find an average' is insufficient
c <i>1/2d</i>	1	* the number of plants or grasses and the mass of plants or grass		both answers are required for the mark 'amount of plants' is insufficient
d <i>1/2d</i>	1	any one from * the number of species of grass * different species * type of plant or seed or grass	accept 'species'	

Tier 5–7		Q No 14		
Part	Mark	Answer	Accept	Additional guidance
e 1/1c	1	any one from * his analysis would allow the effects of soil differences to be controlled or explained * to provide evidence of any difference between soils * the analysis would provide more evidence * to check whether soils were the same or different	accept 'to make sure or so it would be fair' accept 'to check whether soils had an effect on growth'	
f 2/5d 1/2m	1	any one from * different species have different requirements so they are not competing for the same resources * competition might stimulate more vigorous growth * one species may be better adapted to the plot or conditions * you would get continuous growth throughout the year		
Total	6			