

| Tier 3–6 | Q No 1 | | |
|---------------------|-----------|--|---|
| Part | Mark | Answer | Additional guidance |
| a i 4/2b | 1 | * C | |
| a ii 4/2c | 1 | * B | |
| b 4/2a | 1 | * 20 | |
| c 4/2d | 1 | any one from * friction * air resistance or drag * reaction | <i>do not accept 'gravity'</i> accept 'upthrust' |
| Total | 4 | | |

| Tier 3–6 | Q No 2 | | | |
|---------------------|-----------|---|--|---|
| Part | Mark | Answer | Accept | Additional guidance |
| a i 4/1a | 1 | * series * all | | answers must be in the correct order both answers are required for the mark |
| a ii 4/1a | 1 | * parallel * none | | answers must be in the correct order both answers are required for the mark |
| b 4/3b | 1 | * they were reflected or scattered | accept 'some light was absorbed or refracted' accept 'they bounced off' | |
| c 2/3d | 1 1 | * They absorb water from the soil. ✓ * They absorb minerals from the soil. ✓ | | if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero |
| Total | 5 | | | |

| Tier 3–6 | Q No 3 | | | |
|---------------------|-----------|---|--|---|
| Part | Mark | Answer | Accept | Additional guidance |
| a 1/2c | 1 | * predictions ✓ | | if more than one box is ticked, award no mark |
| b 1/2a | 1 | any one from * to make sure any effect of everyone jumping was detected * to make the effect as large as possible | accept 'so the sensor can detect the vibrations' | 'fair test' is insufficient 'to get the best results' is insufficient |
| c i 1/1b | 1 | any one from * there are vibrations in recordings A and B only * no vibrations at C | accept 'there are more or bigger vibrations at A and B' accept 'wider lines in recordings A and B' accept 'bigger amplitude in A and B' accept 'no vibrations far away' | |
| c ii 1/2m | 1 | any one from * more people jumped near A * people jumped from a greater height near A * sensor A is nearer the site than sensor B * more sensitive detectors at A * the ground could be different | accept 'fewer jumped at B' accept the converse accept the converse accept 'the sensor is nearer site A than B' accept 'sensor A is closer to the pupils' accept the converse accept 'one concrete the other grass' | <i>do not accept</i> 'different numbers of people' 'different sensors' is insufficient |
| Total | 4 | | | |

| Tier 3–6 | Q No 4 | | | |
|---------------------|-----------|--|--|---|
| Part | Mark | Answer | Accept | Additional guidance |
| a 3/1h | 1 | * a magnet | accept 'an electromagnet' | <i>do not accept</i> 'a sieve' <i>do not accept</i> 'tweezers' |
| b 3/2b | 1 | any one from * they dissolved * they are soluble in water | accept 'they formed a solution' accept 'they are soluble' | |
| c i 3/1a | 1 | * bubbles formed | | |
| c ii 3/1e | 1 | * It turned cloudy. ✓ | | if more than one box is ticked, award no mark |
| Total | 4 | | | |

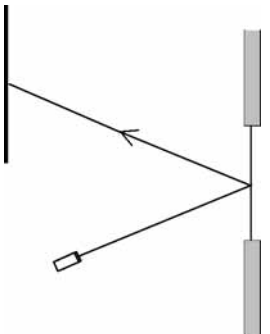
| Tier 3–6 | Q No 5 | | |
|-------------------------|------------------------------|--|---|
| Part | Mark | Answer | Accept Additional guidance |
| a <i>3/1d</i> | 1 1 1 1 | <p>* copper for the base of a saucepan</p> <p>* gold for a ring</p> <p>* helium in a balloon</p> <p>* mercury in a thermometer</p> | <p>It is lighter than air.</p> <p>It is a good conductor of heat.</p> <p>It is a good conductor of electricity.</p> <p>It stays shiny because it does not react with oxygen.</p> <p>It is a liquid at room temperature.</p> <p>if more than one line is drawn from any element, award no mark for that element minimum mark zero</p> |
| b <i>3/1d</i> | 1 | * helium ✓ | if more than one box is ticked, award no mark |
| Total | 5 | | |

| Tier 3–6 | Q No 6 | | | |
|--|-----------|------------------|--|---|
| Part | Mark | Answer | Accept | Additional guidance |
| a i <i>3/2a</i> <i>1/2k</i> | 1 | * 4 | | |
| a ii <i>3/2a</i> | 1 1 | * water * gas | accept H ₂ O accept 'carbon dioxide' or 'CO ₂ ' | answers may be in either order |
| b <i>3/2b</i> | 1 | * solvent ✓ | | if more than one box is ticked, award no mark |
| Total | 4 | | | |

| Tier 3–6 | Q No 7 | | | |
|----------------------------|-----------|--|---|--|
| Part | Mark | Answer | Accept | Additional guidance |
| a <i>1/2a</i> | 1 | * E D A B C | | all five letters must be in the correct order |
| b <i>1/2e</i> | 1 | * to measure volume | accept 'to make sure they used the same volume of water in each beaker' accept 'to measure amount of water' accept 'to measure the volume of salt or sugar' | 'to measure salt or sugar' is insufficient |
| c <i>1/2d</i> | 1 | any one from * they used the same volume of water | accept 'they used the same amount of water' accept 'they stirred the same number of times' accept 'they stirred at the same speed' accept 'they stirred for the same time' | 'they stirred it' is insufficient |
| d i <i>1/2g</i> | 1 | any one from * you might not get the same mass each time * you will not know how much was added | accept 'you might not get the same amount of salt or sugar' accept 'it is not precise or a measurement' | accept answers which suggest that using a spatula is not a precise measurement |
| d ii <i>1/2g</i> | 1 | any one from * measure the mass * measure the number of grams | accept 'measure weight' or 'weigh it' accept 'use a balance or scales' accept 'use grams' accept 'use a measuring cylinder' accept 'level it with a knife' | |
| e <i>1/2c</i> | 1 | * from 1–31 inclusive | | |
| Total | 6 | | | |

| Tier 3–6 | Q No 8 | | | |
|---------------------|-----------|--|--|---|
| Part | Mark | Answer | Accept | Additional guidance |
| a 2/4b | 1 | * They produce milk to feed their young. ✓ | | if more than one box is ticked, award no mark |
| b 2/4b | 1 | any one from * they can fly * they have wings | | |
| c 2/5c | 1 | any one from * it is streamlined * its limbs are like fins or paddles * it has a wide or powerful tail | accept 'its fur is smooth or fine or slopes backwards' accept 'it does not have legs' accept 'it has flippers' | 'it can swim' is insufficient |
| d 2/5c | 1 | any one from * they protect it against predators * they make it difficult for other animals to eat it or catch it | accept 'they protect it' accept 'they stop it being eaten' | |
| e i 2/5c | 1 | any one from * it keeps them warm * it traps air | accept 'it insulates them' accept 'it prevents them getting cold' | <i>do not accept</i> 'it keeps the cold out' |
| e ii 2/5c | 1 | * foxes or predators cannot see them | accept 'they cannot be seen' accept 'they are camouflaged' accept 'they are the same colour as the snow' | |
| Total | 6 | | | |

| Tier 3–6 | Q No 9 | | |
|--------------------------|-----------|--|---|
| Part | Mark | Answer | Additional guidance |
| a i 2/4b | 1 | * grasshopper | |
| a ii 2/5f | 1 | any one from * they eat the plants * the insects eat them | accept 'they eat them' |
| b 2/5e | 1 | any one from * <i>predator</i> : partridge <i>prey</i> : grasshopper or snail * <i>predator</i> : fox <i>prey</i> : partridge * <i>predator</i> : stoat <i>prey</i> : partridge | both the predator and its prey are required for the mark |
| c 2/5e 2/3a | 1 | * They make food by photosynthesis. ✓ | if more than one box is ticked, award no mark |
| d 2/5c 2/5d | 1 | any one from * they can see predators or foxes or stoats * it keeps them warm | |
| e i 2/5d | 1 | any one from * fewer will be found by predators * fewer will be eaten | accept 'they will not be seen' or 'they are camouflaged' accept 'they will not get eaten' |
| e ii 2/5d | 1 | any one from * they may be trodden on or damaged * predators can get to them easily | accept 'they can be found easily' |
| Total | 7 | | |

| 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 | | | | | | |

| 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 <i>3/3d</i> | 1 | * red or pink | accept 'orange' or 'yellow' | |
| a ii <i>3/3d</i> | 1 | * any number greater than 0 and smaller than 7 | accept '0' | |
| b i <i>3/3e</i> | 1 | * carbon dioxide is gas | accept 'carbon dioxide or a gas is produced' | |
| b ii <i>3/3f</i> | 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 <i>3/1e</i> <i>3/3e</i> | 1 1 | * a compound ✓ * a salt ✓ | | if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero |
| d <i>2/2b</i> | 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 | | | |