Mark Scheme (Results)

Summer 2021

Pearson Edexcel International Lower Secondary Curriculum
In Science (LSC11) Paper 01 Year 9 Achievement Test

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Using the Mark Scheme

Examiners should look for qualities to reward rather than faults to penalise. This does NOT mean giving credit for incorrect or inadequate answers, but it does mean allowing candidates to be rewarded for answers showing correct application of principles and knowledge. Examiners should therefore read carefully and consider every response: even if it is not what is expected it may be worthy of credit.

The mark scheme gives examiners:
• an idea of the types of response expected
• how individual marks are to be awarded
• the total mark for each question
• examples of responses that should NOT receive credit.

/ means that the responses are alternatives and either answer should receive full credit.

( ) means that a phrase/word is not essential for the award of the mark, but helps the examiner to get the sense of the expected answer.
Phrases/words in **bold** indicate that the meaning of the phrase or the actual word is **essential** to the answer. ecf/TE/cq (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

Candidates must make their meaning clear to the examiner to gain the mark. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct context.

Quality of Written Communication
Questions which involve the writing of continuous prose will expect candidates to:
• write legibly, with accurate use of spelling, grammar and punctuation in order to make the meaning clear · select and use a form and style of writing appropriate to purpose and to complex subject matter · organise information clearly and coherently, using specialist vocabulary when appropriate.

Full marks will be awarded if the candidate has demonstrated the above abilities.
Questions where QWC is likely to be particularly important are indicated (QWC) in the mark scheme, but this does not preclude others.

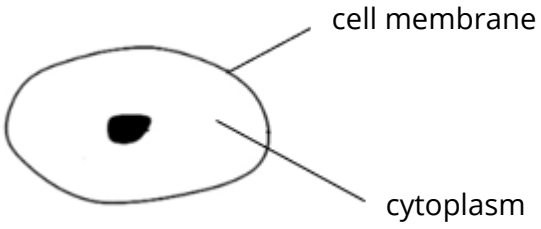
Question number	Answer	Mark
1	**The only correct answer is D the voltage across both bulbs is the same** ***A*** *is not correct because the current flowing through both bulbs would be the same* ***B*** *is not correct because the current flowing through both bulbs would be the same* ***C*** *is not correct because the voltage across both bulbs would be the same*	**(1)**

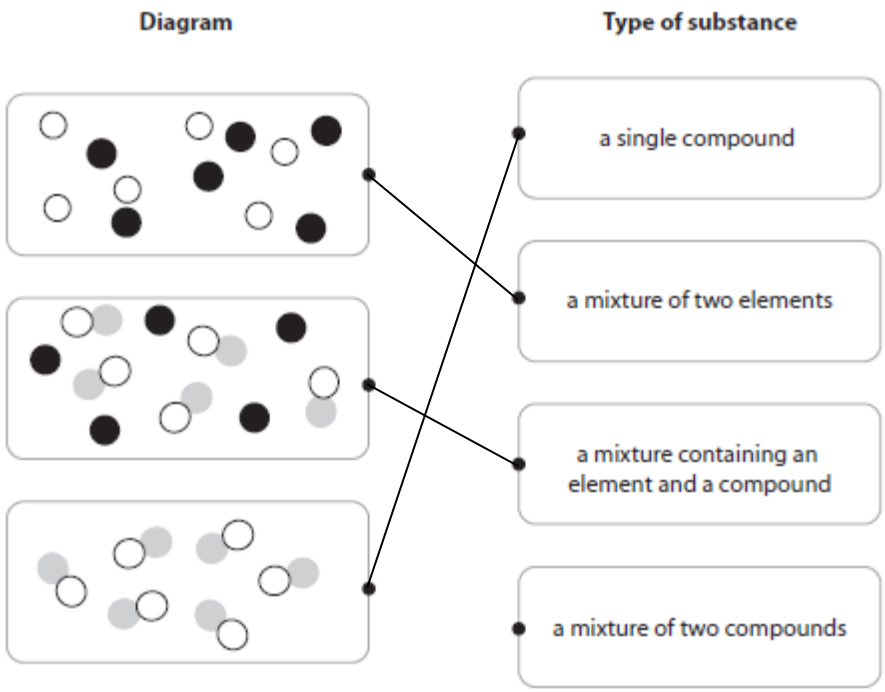
Question number	Answer	Mark
2	**The only correct answer is C, 3 atoms** ***A*** *is not correct because there is 1 atom of carbon and 2 of oxygen in each molecule of carbon dioxide* ***B*** *is not correct because there is 1 atom of carbon and 2 of oxygen in each molecule of carbon dioxide* ***D*** *is not correct because there is 1 atom of carbon and 2 of oxygen in each molecule of carbon dioxide*	**(1)**

Question number	Answer	Mark
3	**The only correct answer is D, 3 $\rightarrow$ 1 $\rightarrow$ 4 $\rightarrow$ 2** ***A*** *is not correct because a selection based on the desirable characteristic must be the start of the process.* ***B*** *is not correct because a selection based on the desirable characteristic must be the start of the process.* ***C*** *is not correct because a selection based on the desirable characteristic must be the start of the process.*	**(1)**

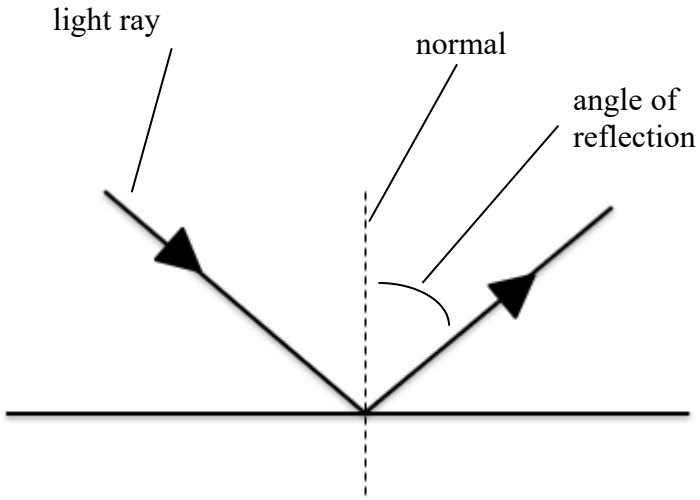
Question number	Answer	Mark
4	**The only correct answer is B, magnesium** ***A*** *is not correct because aluminium is in a different group* ***C*** *is not correct because sodium is in a different group* ***D*** *is not correct because zinc is in a different group*	**(1)**

Question number	Answer	Mark
5	**The only correct answer is B it has thick-walls and carries oxygenated blood at high pressure** ***A*** *is not correct because arteries have high pressure* ***C*** *is not correct because arteries have thick walls and high pressure* ***D*** *is not correct because arteries have thick walls*	**(1)**

Question number	Answer	Additional guidance	Mark
6		One mark for each correct answer.	**(2)**

Question number	Answer	Mark
7	 All 3 correct = 2 marks 1 or 2 correct = 1 mark 0 correct = 0 marks Do not credit where more than one line from any of the diagram boxes is drawn.	(2)

Question number	Answer	Mark
8 (a)	hydrogen accept correct formula	(1)
8(b)	Accept any answer in range 8 – 14 Accept ranges within the accepted range	(1)
8 (c)	(An exothermic reaction) {gives out / produces / releases} {thermal / heat (energy)}	(1)

Question number	Answer	Mark
9	normal drawn perpendicular to mirror (judge by eye) where incident ray meets the mirror (1) reflected ray with arrow to indicate direction drawn on opposite side of normal to the incident ray (1) Angle of reflection equal to angle of incidence (judge by eye) (1)  	(3)

Question number	Answer	Additional guidance	Mark
10 (a)	<table><tr><th>Micro-organism</th><th>Cell wall</th><th>Mitochondria</th><th>Nucleus</th></tr><tr><td>bacteria</td><td>✓</td><td>×</td><td>×</td></tr><tr><td>fungi</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>**virus**</td><td>**×**</td><td>**×**</td><td>**×**</td></tr></table>	All three correct for one mark	(1)
10 (b)	they do not show (all seven) characteristics of living things / they cannot live independently / they cannot reproduce independently	Accept a virus can only reproduce when it inhabits a host (cell)	(1)

Question number	Answer	Mark
11(a)	ohm(s)/Ω	(1)

Question number	Answer	Mark
11(b)	**3 (ohms)** Correct answer scores 2 marks If answer is incorrect award 1 mark if a correct rearrangement of the formula is seen either in numbers (4.5/1.5) or in symbols (R=V/I)	(2)

Question number	Answer	Mark
12	**The only correct answer is A, 0.5 : 1** ***B*** *is not correct because surface area is 6 x 12 x 12 and volume is 12 x 12 x 12 so ratio is 0.5 :1* ***C*** *is not correct because surface area is 6 x 12 x 12 and volume is 12 x 12 x 12 so ratio is 0.5 :1* ***D*** *is not correct because surface area is 6 x 12 x 12 and volume is 12 x 12 x 12 so ratio is 0.5 :1*	(1)

Question number	Answer	Mark
13	**The only correct answer is A, glass, PVC** ***B*** *is not correct because MDF is a composite material, not a polymer* ***C*** *is not correct because GRP is a composite material not a ceramic* ***D*** *is not correct because glass is a ceramic not a polymer*	(1)

Question number	Answer	Mark
14	**The only correct answer is C** ***A*** *is not correct because it has a lower frequency than C* ***B*** *is not correct because it has a lower frequency than C* ***D*** *is not correct because it has a lower frequency than C*	(1)

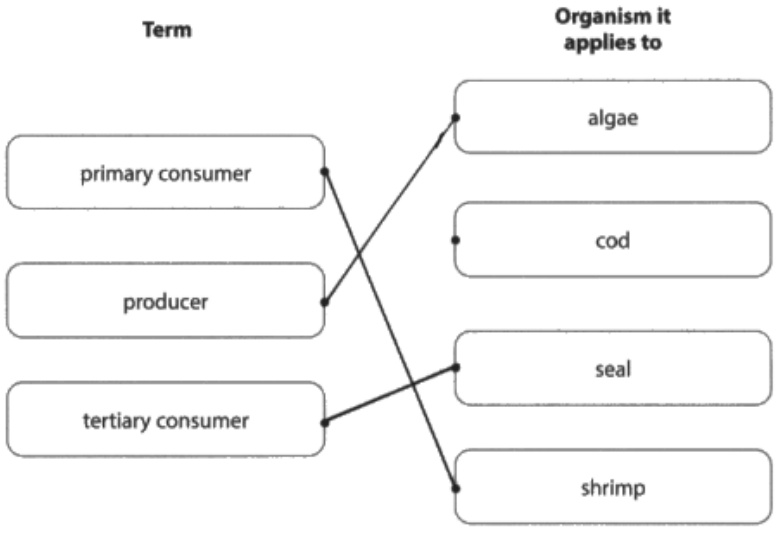
Question number	Answer	Mark
15	**The only correct answer is B, 14** ***A*** *is not correct because 13 is the number of protons* ***C*** *is not correct because 27 is the mass number* ***D*** *is not correct because 40 is bigger than the mass number*	**(1)**

Question number	Answer	Mark
16	**The only correct answer is C, Nm** ***A*** *is not correct because N is the unit of force* ***B*** *is not correct because N/m is not a valid unit* ***D*** *is not correct because* Nm^2 is not a valid unit	**(1)**

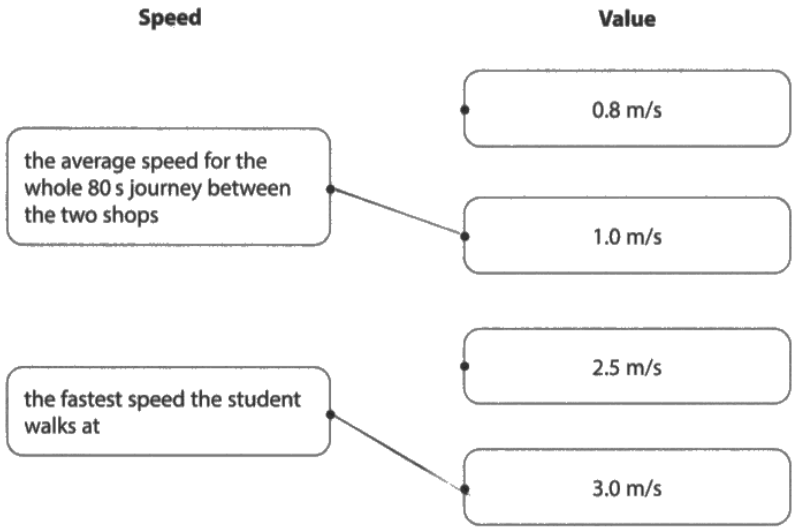
Question number	Answer	Mark
17	**One** mark for each correct answer Gravity is an example of a **non-contact** force. The upward force on the parachutist is caused by **air resistance.** When the parachute reaches terminal velocity, the **resultant** force is zero.	**(3)**

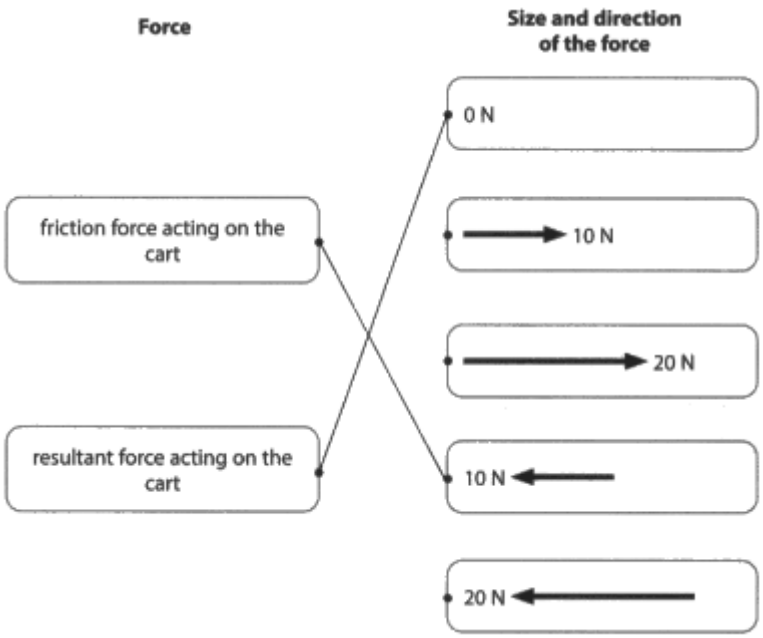
Question number	Answer	Mark
18	<table><tr><th></th><th colspan="3">relative charge</th></tr><tr><th></th><th>+1</th><th>0</th><th>-1</th></tr><tr><td>electron</td><td></td><td></td><td>✓</td></tr><tr><td>neutron</td><td></td><td>✓</td><td></td></tr><tr><td>proton</td><td>✓</td><td></td><td></td></tr></table> **All** correct for 1 mark Do not award mark if more than one tick in any row	(1)

Question number	Answer	Mark
19	The greatest proportion of air is **nitrogen** whilst approximately 21% of the air is **oxygen**.	(2)

Question number	Answer	Mark
20(a)	 All 3 correct = 2 marks 1 or 2 correct = 1 mark 0 correct = 0 marks Do not award mark for answers with more than one line from any of the boxes on the left.	(2)

Question number	Answer	Mark
20(b)	white fur / small ears / big feet / (strong) claws **ACCEPT thick** fur / thick layer of fat / thick hide/ thick skin	(1)

Question number	Answer	Mark
21	 **One** mark for each correct line. Do not award a mark if more than one line is drawn from a speed box.	(2)

Question number	Answer	Mark
22	 **One** mark for each correct line. Do not award a mark if more than one line is drawn from a force box.	**(2)**

Question number	Answer	Mark
23	(the student's pulse rate) increases (1) (Because) (their muscles) need more oxygen/fuel/glucose (1)	**(2)**

Question number	Answer	Mark
24	**The only correct answer is B, cholera and salmonella** ***A*** *is not correct because athletes' foot and flu are not caused by bacteria* ***C*** *is not correct because flu is a virus and scurvy is caused by a dietary deficiency* ***D*** *is not correct because malaria and rickets are not caused by bacteria*	**(1)**

Question number	Answer	Mark
25	**The only correct answer is D** acid + metal carbonate → salt + water + carbon dioxide ***A*** *is not correct because the reaction also produces water* ***B*** *is not correct because the reaction does not produce hydrogen* ***C*** *is not correct because the reaction also produces carbon dioxide*	**(1)**

Question number	Answer	Mark
26	**The only correct answer is C,** the objects will attract each other if one object is positive and the other is negative ***A*** *is not correct because they would repel if both were positive* ***B*** *is not correct because they would repel if both were negative* ***D*** *is not correct because charged objects exert a force on each other*	**(1)**

Question number	Answer	Mark
27	**The only correct answer is C,** $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ ***A*** *is not correct because* CO_2 should be produced ***B*** *is not correct because not enough* CO_2 is produced in this equation ***D*** *is not correct because* not enough oxygen is present in the reactants.	**(1)**

Question number	Answer	Mark
28	**The only correct answer is C 7500 N** ***A*** *is not correct because 500 N would produce an anticlockwise moment that is too small to balance the load.* ***B*** *is not correct because 4500 N would produce an anticlockwise moment that is too small to balance the load.* ***D*** *is not correct because 22 500 N would produce an anticlockwise moment that is too large to balance the load.*	**(1)**

Question number	Answer	Mark
29	(work done = 690 x 10 =) 6900 (1) (Units =) Nm / J / joules (1)	**(2)**

Question number	Answer	Additional guidance	Mark
30(a)	Any **two** from fat / carbohydrate / vitamins / minerals / fibre	ACCEPT any named vitamin (eg vitamin C) or named mineral (eg iron) ACCEPT roughage for fibre Allow water	**(2)**

Question number	Answer	Additional guidance	Mark
30(b)	starvation is caused by not eating (enough) / (sufficient) food (1) malnutrition is not consuming the correct proportion of fat / carbohydrate / vitamins / minerals (1)	ACCEPT not having a properly balanced diet / not the correct balance of nutrients	**(2)**

Question number	Answer	Additional guidance	Mark
31(a)	reduction	ALLOW displacement	**(1)**

Question number	Answer		Mark
31(b)	iron is more reactive than lead (1) metal X is more reactive than iron (and lead) (1)	Accept order of reactivity is X, iron, lead (1) with X being the most reactive (1) Accept reverse arguments	**(2)**

Question number	Answer	Additional guidance	Mark
32	(water molecules will diffuse/move) into the cell (1) (because) concentration (of water molecules) is greater outside the cell (1)	 ALLOW water moves from high concentration to low concentration	**(2)**

Question number	Answer	Mark
33(a)	correct identification of hydrogen (H_2) as a product (1) correctly balanced chemical equation (1) Mg + **2** HCl → $MgCl_2$ + **H_2**	**(2)**

Question number	Answer	Mark
33(b)	(156.00 + 5.0) – 160.78 (1) 0.22(g) (1) Correct answer without working scores 2 marks	**(2)**

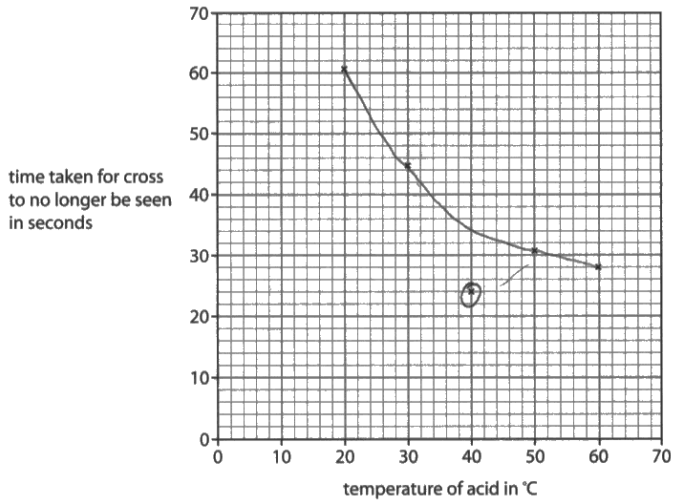
Question number	Answer	Mark
34(a)(i)	measuring cylinder / pipette / burette	**(1)**

Question number	Answer	Additional guidance	Mark
34(a)(ii)	(moderate) (health) hazard	**ACCEPT** harmful / irritant	**(1)**

Question number	Answer	Additional guidance	Mark
34(a)(iii)	wear (safety) goggles / safety glasses /eye protection		**(1)**

Question number	Answer	Mark
34(b)	<table><tr><th>Variable</th><th>Control variable</th><th>Dependent variable</th><th>Independent Variable</th></tr><tr><td>concentration of sodium thiosulfate solution</td><td>✓</td><td></td><td></td></tr><tr><td>volume of hydrochloric acid and sodium thiosulfate</td><td>✓</td><td></td><td></td></tr><tr><td>temperature of dilute hydrochloric acid</td><td></td><td></td><td>✓</td></tr><tr><td>time taken for cross to no longer be seen</td><td></td><td>✓</td><td></td></tr></table> Do not award mark if more than one tick in any row	(3)

Question number	Answer	Additional guidance	Mark
34(c)(i)	point at 40°C circled		(1)

34(c)(ii)	Smooth curve missing out point at 40°C  	Ignore any curve drawn outside of given points	**(1)**

Question number	Answer	Mark
35(a)	2.0	**(1)**

Question number	Answer		Mark
35(b)	as the number of weights increases (1) the stretch increases / pointer position reading decreases (1)	Allow each time a weight is added the rubber stretches 2.5 cm or stretch is directly proportional to the number of weights added to gain both marks	**(2)**

Question number	Answer	Additional guidance	Mark
35(c)	{initially / for small weights / for up to 4 weights} rubber band A stretches more than rubber band B (1) with {5 / 6 } weights rubber band B does have a greater stretch than A (1) when more than 3 weights are added (to the rubber bands) B stretches more than A for each added weight (1)	Accept RA Accept RA Accept RA	**(3)**

Question number	Answer	Additional guidance	Mark
36(a)	the (rate of) photosynthesis / number of bubbles produced (per minute) will increase		**(1)**

Question number	Answer	Mark
36(b)	voltmeter drawn in parallel with bulb	**(1)**

Question number	Answer	Mark
36(c)(i)	(number of) bubbles per minute	**(1)**

Question number	Answer	Mark
36(c)(ii)	keeps distance between lamp and pond weed the same throughout / control the water temperature / darkened room ensures that ambient light has no effect OWTTE	**(1)**

Question number	Answer	Mark
36(c)(iii)	repeat (and average) (investigation)	**(1)**

Question number	Answer	Mark
36(d)	how does the rate of photosynthesis vary with the distance between the lamp and the pondweed? **ACCEPT** any other valid suggestion.	**(1)**