



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle 2025

Marking Scheme

Science

Common Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

Guidelines for Examiners

1. In many cases only key phrases are given in the marking scheme. These points contain the information and ideas that must appear in the candidate's answer in order to merit the assigned marks. A word or term that appears in brackets () is not a requirement of the answer, but is used to contextualise the answer.
2. The descriptions, methods and definitions given in a marking scheme are not exhaustive and alternative valid answers are acceptable.
3. Words, expressions or statements separated by a solidus (/) are alternatives which are equally acceptable for a particular point. Note, however, that words, expressions or phrases must be used in the correct context. A double solidus (//) separates points for which separate marks are allocated in a part of the question.

4. Cancelled or repeated answers

- a. In the case of short-answer questions, if an answer is cancelled and a second answer given, the cancellation is accepted and marks are awarded for the uncanceled answer.
- b. If more than the required number of uncanceled answers are given, surplus incorrect answers nullify the marks awarded for correct answers.
- c. If the only answer offered is cancelled, the cancelling is ignored and the answer marked as normal.

5. Recording a mark of zero and recording "No Response" (NR)

A zero should only be recorded when the candidate has attempted the question but does not merit marks.

If a candidate does not attempt a question (or full question part) examiners should record NR.

6. Application of the marking scheme

Apply the marking scheme as agreed in all cases.

7. Electronic annotation of responses

Annotations should allow your Advising Examiner to understand the mark you awarded. Examiners are expected to annotate parts of the responses as directed at the marking conference. (See **JC Science 2025 – Annotations** on page 5.)

8. Bonus for Irish

Bonus marks at the rate of 10% of the marks obtained in S26T will be given to a candidate who answers S26T entirely through Irish and who obtains 75% or less of the total mark available in S26T (i.e. 270 marks or less). In calculating the bonus to be applied decimals are always rounded down, not up e.g., 4.5 becomes 4; 4.9 becomes 4, etc. See below for when a candidate is awarded more than 270 marks in S26T.

Marcanna Breise as ucht freagairt trí Ghaeilge – JC Science 2025

Léiríonn an tábla thíos an méid marcanna breise ba chóir a bhronnadh ar iarrthóirí a ghnóthaíonn níos mó ná 75% d'iomlán na marcanna.

Ba chóir marcanna de réir an ghnáthrata a bhronnadh ar iarrthóirí nach ngnóthaíonn níos mó ná 75% d'iomlán na marcanna don scrúdú. Ba chóir freisin an marc bónais sin a **shlánú síos**.

Tábla 360 @ 10%

Bain úsáid as an tábla seo i gcás na n-ábhar a bhfuil 360 marc san iomlán ag gabháil leo agus inarb é 10% gnáthrata an bhónais.

Bain úsáid as an ngnáthrata i gcás 270 marc agus faoina bhun sin. Os cionn an mharc sin, féach an tábla thíos.

Bunmharc	Marc Bónais
271 - 273	26
274 - 276	25
277 - 280	24
281 - 283	23
284 - 286	22
287 - 290	21
291 - 293	20
294 - 296	19
297 - 300	18
301 - 303	17
304 - 306	16
307 - 310	15
311 - 313	14
314 - 316	13

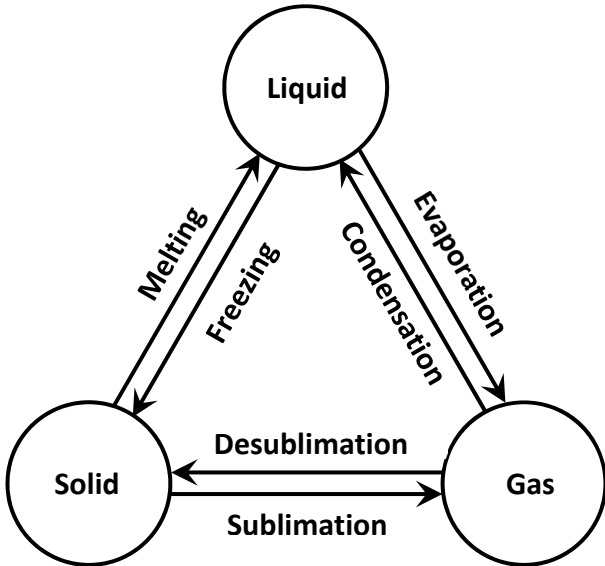
Bunmharc	Marc Bónais
317 – 320	12
321 – 323	11
324 – 326	10
327 – 330	9
331 – 333	8
334 – 336	7
337 – 340	6
341 – 343	5
344 – 346	4
347 – 350	3
351 – 353	2
354 – 356	1
357 – 360	0

Annotations used in online marking Junior Cycle Science 2025

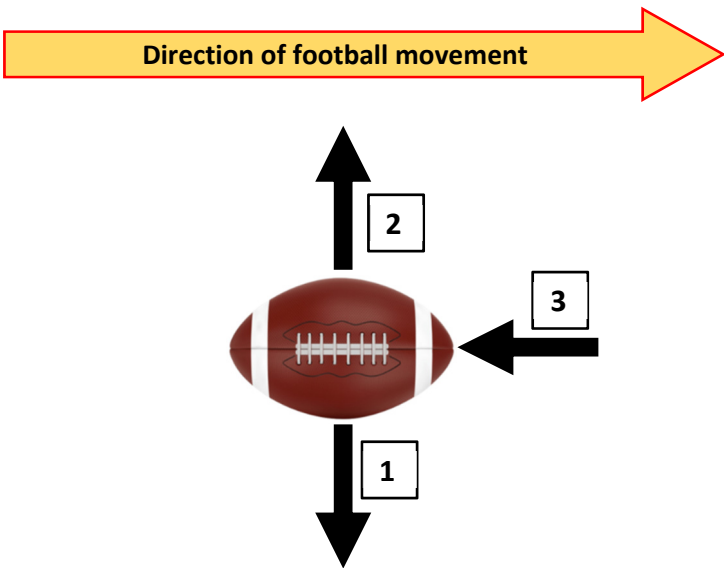
Annotation	Meaning
	'n' marks awarded; e.g. 1 – 12
	No marks awarded. Answer incorrect or insufficient.
	Used to annotate a blank page; e.g. pages 13 & 26 or when additional space used
	Used to underline valid words/statements
	Cancellation
	Used to annotate part of an item which has not been attempted
	Used to indicate a missing word or phrase

Section A

Q1				Marks																		
	<table><tr><th>Factor</th><th>Natural</th><th>Mainly due to human activity</th></tr><tr><td>Ocean currents</td><td>✓</td><td></td></tr><tr><td>Volcanic eruptions</td><td>✓</td><td></td></tr><tr><td>Cutting down trees</td><td></td><td>✓</td></tr><tr><td>Movement of tectonic plates</td><td>✓</td><td></td></tr><tr><td>Burning of fossil fuels</td><td></td><td>✓</td></tr></table>			Factor	Natural	Mainly due to human activity	Ocean currents	✓		Volcanic eruptions	✓		Cutting down trees		✓	Movement of tectonic plates	✓		Burning of fossil fuels		✓	5(3)
	Factor	Natural	Mainly due to human activity																			
	Ocean currents	✓																				
	Volcanic eruptions	✓																				
	Cutting down trees		✓																			
	Movement of tectonic plates	✓																				
	Burning of fossil fuels		✓																			

Q2				Marks
(a)				3(3)
(b)	Physical			3
	Justify: no new substance formed / no change in (chemical) composition Accept: can be reversed			3

Q3		Marks
(a)	(Student) B	3
(b)	20 (bpm)	3
(c)	4 (minutes)	3
(d)	Student B	3
(e)	Valid lifestyle factor	3

Q4		Marks
(a)		3(3)
(b)	3.92 Accept 3.9 and 4 Award 3m for incomplete processing	5
	Newtons / N	1

Q5		Marks: 4 + 4 + 4 + 2 + 1
(a)	(i)	Electron
	(ii)	Neutron
	(iii)	(Electrons orbit the nucleus) like planets orbit the Sun
(b)	(i)	Nitrogen
	(ii)	NH ₃

Q6		Marks
(a)		
(b)	Acidic	3
(c)	Water	3

Q7		Marks: 4 + 4 + 4 + 2 + 1
(a)	Valid benefit stated	
(b)	As (global) temperatures increase	
	Variety of life (biodiversity) decreases	
(c)	Two valid ways described	

Q8					Marks												
		<table><tr><th>Letter</th><th>Part of breathing system</th></tr><tr><td>A</td><td>Alveolus</td></tr><tr><td>B</td><td>Diaphragm</td></tr><tr><td>C</td><td>Bronchus</td></tr><tr><td>D</td><td>Trachea</td></tr><tr><td>E</td><td>Lung</td></tr></table>	Letter	Part of breathing system	A	Alveolus	B	Diaphragm	C	Bronchus	D	Trachea	E	Lung			3 3 3 3 3
Letter	Part of breathing system																
A	Alveolus																
B	Diaphragm																
C	Bronchus																
D	Trachea																
E	Lung																

Q9				Marks
	<u>Mass</u> is a measure of the amount of matter in an object and affects an object's resistance to <u>Acceleration</u>. <u>Density</u> is a measure of the mass per unit volume of an object and is related to the ability of a substance to float in a liquid. <u>Time</u> is a dimension in which events unfold continuously, forming the basis for understanding change and motion. <u>Temperature</u> is directly proportional to the kinetic energy of the particles within a substance and affects the physical state and behaviour of a substance.			3 3 3 3 3

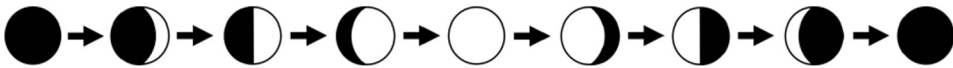
Q10	Marks: 6 + 3 + 3 + 3		
(a)	(Reaction) B		
(b)	(Reaction) C		
(c)	(Reaction) A		
(d)	A low activation energy results in a reaction which will be fast.		

Section B

Q11					Marks												
(a)		Battery			3												
(b)		<table><tr><th>Statement</th><th>True</th><th>False</th></tr><tr><td>The resistor is connected in series with the LED.</td><td>✓</td><td></td></tr><tr><td>When the switch is closed, the LED will emit light.</td><td></td><td>✓</td></tr><tr><td>The resistor increases the current flowing in the LED.</td><td></td><td>✓</td></tr></table>			Statement	True	False	The resistor is connected in series with the LED.	✓		When the switch is closed, the LED will emit light.		✓	The resistor increases the current flowing in the LED.		✓	3
	Statement	True	False														
	The resistor is connected in series with the LED.	✓															
	When the switch is closed, the LED will emit light.		✓														
The resistor increases the current flowing in the LED.		✓															
				3													
				3													
				3													
(c)	(i)	Ammeter			3												
	(ii)	Voltmeter			3												
(d)	(i)	its resistance decreased by 26 kΩ			3												
	(ii)	20 000 (ohms / Ω) or 20 (kΩ) Award 3m for 8 ÷ 0.0004 or correct processing leading to an incorrect answer			6												
		12 (°C)			3												

Q12		Marks
(a)	(i) Length × width × height	3
	(ii) <u>Ends:</u> $([2 \times 2] \times 2) = 8 \text{ (cm}^2\text{)}$ Award 1m for 2×2 <u>Sides:</u> $([16 \times 2] \times 4) = 128 \text{ (cm}^2\text{)}$ Award 1m for 16×2 <u>Total:</u> $(8 + 128 =) 136 \text{ (cm}^2\text{)}$	3 3 3
(b)	No (smaller) villi // less (surface) area	2(3)
(c)	(i) Balance / scales	3
	(ii) Dish 2	3
(d)	(i) The concentration of hydrochloric acid	3
	The temperature of the acid	3
	The total mass of the marble chips	3
	(ii) The volume of gas produced each minute / the size of the marble chips	3
(e)	(i) Blue	3
	Justify: Less steep	3
	(ii) Green	3
	Justify: Levels off first	3
(f)	Method	3
	Two requirements named	2(3)
	Test for gas including result	3

Gas	Method	Requirement 1	Requirement 2	Test
Oxygen	Mix / add	Hydrogen peroxide / H_2O_2	Catalase or named source / Manganese dioxide (MnO_2) / Time	Relights a glowing splint
	Electrolysis / Voltameter	Water / H_2O	Sulfuric acid / H_2SO_4 / acidified	
	Expose to light	Pondweed	Water	
Hydrogen	Electrolysis / Voltameter	Water / H_2O	Sulfuric acid / H_2SO_4 / acidified	Burns with a pop
	Mix / add	Water / H_2O	Correct metal	
	Mix / add	Hydrochloric acid / HCl / sulfuric acid / H_2SO_4 / ethanoic acid / CH_3COOH	Correct metal	

Q13				Marks
(a)	Statement	True	False	
	Acceleration due to gravity is the same on Mars and Mercury.	✓		3
	The planet with the smallest density has the largest volume.		✓	3
	The number of moons orbiting the planets decreases the further the planets are from the Sun.		✓	3
	Mars has the lowest mean surface temperature and is furthest from the Sun.	✓		3
	The planet with the smallest mass is the planet furthest from the Sun.		✓	3
	The planet with the largest diameter is the planet which takes the longest to orbit the Sun.		✓	3
	Venus takes longer to rotate on its own axis compared to the time it takes to orbit the Sun.	✓		3
	An eclipse can occur on Mercury.		✓	3
(b)	A solar eclipse was observed from position A.			3
(c)	New (moon)			3
(d)				3
(e)	One (revolution)			3
(f)	The Sun, Moon and Earth are not always aligned / the Moon's orbit is tilted			3

(g)	Name of technological application	3
	Impact on science - how the named object has improved or developed or helped our scientific understanding	3
	Impact on society - how the named object has affected society – positive or negative	3
	Impact on the environment - how the named object has affected the environment – positive or negative	3
(h)	Three valid examples discussed <i>Different examples and discussion from one or more of the following headings:</i> Improve our knowledge of the Universe / potential colonisation of other planets / creates jobs / space tourism / improves international relations / to obtain resources / advancements in climate science / development of new technologies / other valid examples 1m for example, 2m for discussion	3(1+2)

Q14				Marks	
(a)		Living		3	
(b)	(i)	Chloroplast		3	
	(ii)	Mitochondrion		3	
	(iii)	Oxygen		3	
(c)	(i)	As light (intensity) increases		3	
		(the rate of) photosynthesis increases (Accept converse relationship)		3	
	(ii)	(Plant) A		3	
		Justify: higher rate (of photosynthesis at lower light intensity)		3	
(d)	When the Earth is tilted towards the Sun		or	When the Earth is tilted away from the Sun	2
	more light received			less light received	2
	higher (rate of) photosynthesis			lower (rate of) photosynthesis	2
(e)	(i)	To show that the temperature increase came from the peas			3
	(ii)	Graphs – points			13(1)
		In question 14 (e) (ii), the increments on the y-axis are not consistent between the '30' and the '35' points, when compared to the other points on this axis. There are four increments between the points '30' and '35', whereas there should be five. Candidates are to be given the marks available for the following points: (12,32), (15,35) and (18,37).			
		Two lines drawn through relevant points			2(1)
One mark can be awarded for joining the first four data points for Flask A.					
	(iii)	Respiration occurred in flask A (live peas) but not in flask B (dead peas)			3
		Award 2m for reference to respiration and one result only (Flask A/live peas or Flask B/dead peas)			
(f)	(i)	Correct circle drawn			3
	(ii)	The rotation of the Earth (on its axis)			3
	(iii)	Respiration is light independent, photosynthesis is light dependent			3
Award 2m for respiration is light independent or photosynthesis is light dependent					

