Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle 2024

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 correctly used in 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 uncancelled answer.

b. If more than the required number of uncancelled 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.

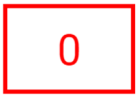
7. Electronic annotation of responses

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 2024 – Annotations** on page 4.)

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 page 6 for when a candidate is awarded more than 270 marks in S26T.

Annotations used in online marking of Junior Cycle Science 2024

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 2, 12, 26 & 27 or when additional space used
	Used to underline valid words/statements
	Cancellation
	Incorrect
	Used to annotate part of an item which has not been attempted

Grading Table

Mark	Descriptor
324 – 360	Distinction
270 – 323	Higher Merit
198 – 269	Merit
144 – 197	Achieved
72 – 143	Partially Achieved
0 – 71	NG

Bonus marks for answering through the medium of Irish

Bonus marks at the rate of 10% of the marks obtained will be given to a candidate who answers entirely through Irish and who obtains 75% or less of the total mark available in (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.

Marcanna Breise as ucht freagairt trí Ghaeilge – TSCL Eolaíocht 2024

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 ghnáthráta 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% gnáthráta an bhónais.

Bain úsáid as an ngnáthráta 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

Section A

Q1		Marks
(a)	Grass	**3**
(b)	Blackbird	**3**
(c)	Solar energy to chemical energy	**3**
(d)	Heat	**3**
(e)	(Large amount of) energy lost (at each trophic level) / low transfer of energy (from one trophic level to the next) / little energy remains (after four trophic levels)	**3**

Q2		Marks
(a)		

Source	Renewable	Non-renewable	Marks
Water	✓		**2**
Coal		✓	**2**
Oil		✓	**2**
Wind	✓		**2**
Sun	✓		**2**

(b)	Yes / No + valid justification (Accept Yes / No without justification for 2m) (Accept valid justification without Yes / No for 4m)	**5**

Q3		Marks
(a)	Sand // It sank / did not float / at the bottom	**3** **3**
(b)	Oil (floats) on top / did not dissolve / they separate into layers	**3**
(c)	Diagram of valid separation technique Any one correct label	**3** **3**

Q4		Marks
		3+4+4+4

Graph	Statement
A	**The object moved with constant speed / 2**
B	**The object did not move / 1**
C	**The object accelerated / 3**
D	**The object moved with constant speed / 2**

Q5		Marks
(a)	Bulbs 2 and 3 would go out	**6+5+3+1**
(b)	Bulbs 2 and 3 would shine with the same brightness at before	
(c)	4 volts	
(d)	12 Volts	

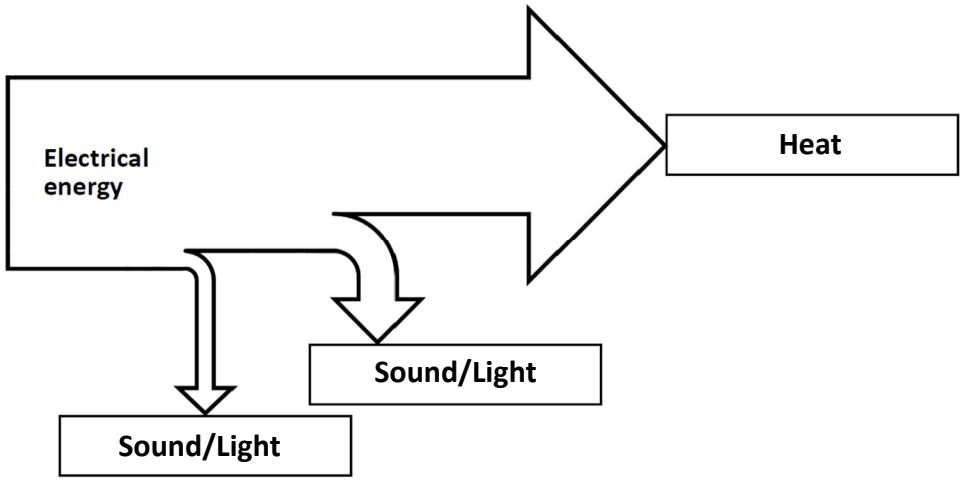
Q6		Marks
(a)	3:1	**3**
(b)	T or t	**3**
(c)	Tt	**3**
(d)	T	**3**
(e)	Sexual	**3**

Q7		Marks

Property	**Comet** or **asteroid** or **both**	
Usually contains ice	**Comet**	**3**
Mostly located in a belt between Mars and Jupiter	**Asteroid**	**3**
Forms a tail when it passes through the inner solar system	**Comet**	**3**
Often found in orbit around the Sun	**Both**	**3**
Usually located in the outer solar system	**Comet**	**3**

Q8		Marks

Letter	Part of reproductive system	
A	**Ovary**	**3**
B	**Fallopian Tube**	**3**
C	**Uterus**	**3**
D	**Testis**	**3**
E	**Sperm duct**	**3**

Q9		Marks
(a)	The rate at which electrical energy is used in an electric circuit	**2**
(b)	10 A	**2**
(c)	23 // Ω	**1+1**
(d)		**3(3)**

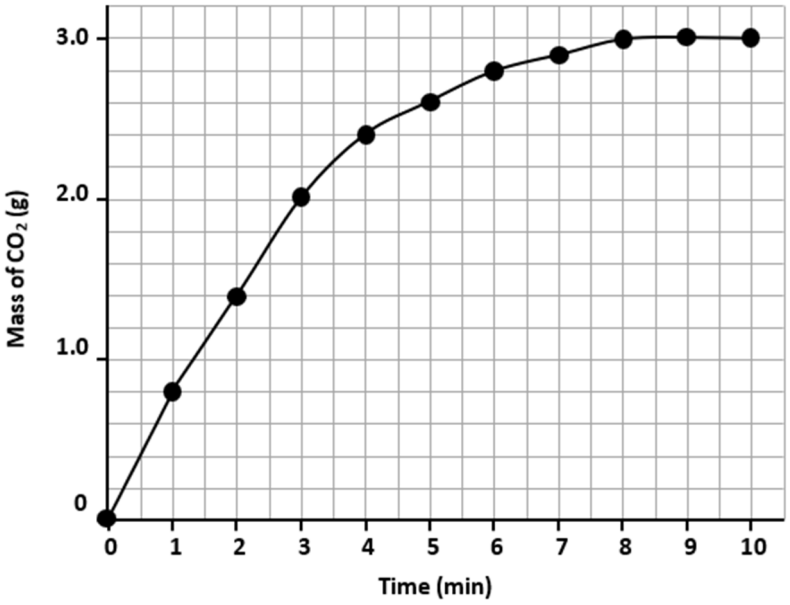
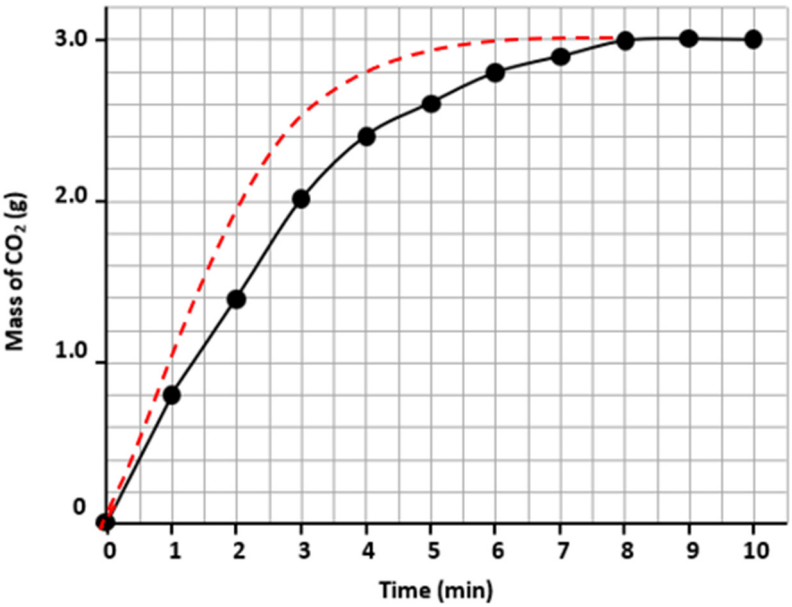
Q10		Marks
(a)	Europe and North America	**3**
(b)	22.8(%)	**3**
(c)	Any valid suggestion	**3**
(d)	Yes / No + valid justification (Accept Yes / No without justification for 2m) (Accept valid justification without Yes / No for 4m)	**6**

Section B

<table>
<tr><th>Q11</th><th></th><th>Marks</th></tr>
<tr><td>(a)</td><td>0.25
(Award 3m for incomplete processing)

m/s^2 or m/s/s or ms^{-2}</td><td>6

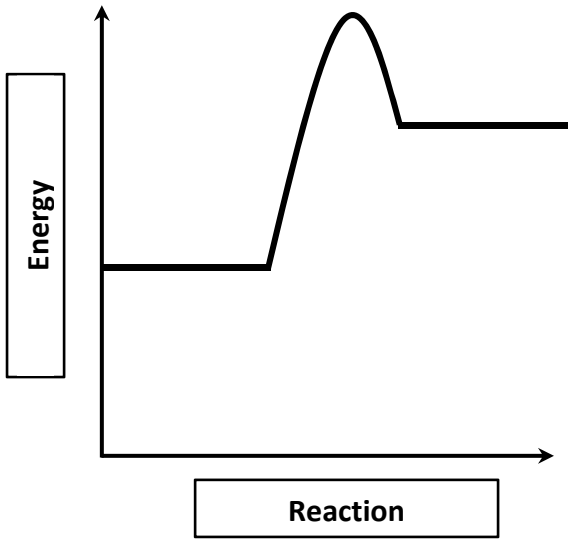
2</td></tr>
<tr><td>(b)</td><td><table><tr><th>Arrow</th><th>1</th><th>2</th><th>3</th></tr><tr><td>Force</td><td>Tension</td><td>Friction</td><td>Weight</td></tr></table></td><td>4+4+4</td></tr>
<tr><td>(c)</td><td>C
It is the highest point on track</td><td>3
3</td></tr>
<tr><td>(d)</td><td>Valid reason</td><td>4</td></tr>
</table>

Q12		Marks
(a)	Student 3	**3**
(b)	Student 1	**3**
(c)	Student 2	**3**
(d)	Graph: 11 points plotted correctly All 11 points connected  	**11(1)** **1**
(e)	8 (mins)	**3**
(f)	Steeper // Levels off at 3.0 g before 8 min  	**3** **3**

Q13			Marks
(a)	Valid hypothesis (Award 2 m where only one variable is mentioned)		**3**
(b)	(Type of) soil		**3**
(c)	Mass of soil / seed type / number of seeds / volume of water / temperature / light intensity / size of container / oxygen concentration / other correct		**3**
(d)	More reliable data		**3**
(e)	Yes / No based on valid hypothesis in (a) with justification (Accept Yes / No based on valid hypothesis in (a) without justification for 2m) (Accept a justification based on valid hypothesis in (a) without Yes / No for 4m)		**6**
(f)	**(i)**	Interdependence	**3**
	(ii)	Photosynthesis	**3**
	(iii)	Temperature // carbon dioxide (CO_2) // water (H_2O) // light // radiation **Any two**	**2(3)**

Q14		Marks
(a)	Red	**4+4+4+3**
(b)		
(c)	1	
(d)	Moon blocks light (from the Sun reaching the Earth) or implied	
(e)	20	**3**
(f)	24 (Moon was) closest to Earth / shortest distance	**3** **3**
(g)	No or implied Distance (from Moon to Earth) is not constant or explained	**3** **3**

Q15		Marks
(a)	(Identification) key	**3**
(b)	(Group) B Valid justification	**3** **3**
(c)	40 (%) (Award 2m for incomplete processing)	**3**
(d)	Quantitative (Based on) numbers	**6** **3**
(e)	0.25 (m^2) (Award 3m for incomplete processing)	**6**
(f)	28 000 (Award 2m for incomplete processing)	**3**

Q16		Marks
(a)	Gas	**3**
(b)	Solid	**3**
(c)	Liquid	**3**
(d)	50 (°C)	**3**
(e)	6 (min)	**3**
(f)	X-axis: Reaction (progress) Y-axis: Energy Correct profile drawn  	**3** **3** **3**
(g)	The energy of the particles increases and they move further apart	**3**
(h)	Cool / condense / increase pressure	**3**

<table>
<tr><th colspan="2">Q17</th><th></th><th>Marks</th></tr>
<tr><td>(a)</td><td>(i)</td><td>We are made of carbon / we eat carbon / our economies (homes) (means of transport) are built on carbon</td><td>3</td></tr>
<tr><td></td><td>(ii)</td><td>Rocks</td><td>3</td></tr>
<tr><td>(b)</td><td>(i)</td><td>
<table>
<tr><th>Reservoir A</th><th>Reservoir B</th><th>Carbon transfer process</th></tr>
<tr><td>Atmosphere</td><td>Ocean water</td><td>Dissolving</td></tr>
<tr><td>Fossil fuel</td><td>Atmosphere</td><td>Combustion</td></tr>
<tr><td>Land plants</td><td>Soil</td><td>Decomposition</td></tr>
<tr><td>Limestone</td><td>Ocean or fresh water</td><td>Weathering/Dissolving</td></tr>
</table>
</td><td>3
3
3</td></tr>
<tr><td></td><td>(ii)</td><td>Respiration</td><td>3</td></tr>
<tr><td>(c)</td><td>(i)</td><td>Similar diameter // similar mass // similar density Any two</td><td>2(3)</td></tr>
<tr><td></td><td>(ii)</td><td>No (liquid) water (to dissolve carbon dioxide)</td><td>6</td></tr>
</table>