

GCSE Examiners' Report

Science (Double Award)

GCSE

Summer 2025

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Introduction

Our Principal examiners' report provides valuable feedback on the recent assessment series. It has been written by our Principal Examiners and Principal Moderators after the completion of marking and moderation, and details how candidates have performed in each unit.

This report opens with a summary of candidates' performance, including the assessment objectives/skills/topics/themes being tested, and highlights the characteristics of successful performance and where performance could be improved. It then looks in detail at each unit, pinpointing aspects that proved challenging to some candidates and suggesting some reasons as to why that might be.¹

The information found in this report provides valuable insight for practitioners to support their teaching and learning activity. We would also encourage practitioners to share this document – in its entirety or in part – with their learners to help with exam preparation, to understand how to avoid pitfalls and to add to their revision toolbox.

Further support

Document	Description	Link
Professional Learning / CPD	WJEC offers an extensive programme of online and face-to-face Professional Learning events. Access interactive feedback, review example candidate responses, gain practical ideas for the classroom and put questions to our dedicated team by registering for one of our events here.	https://www.wjec.co.uk/home/professional-learning/
Past papers	Access the bank of past papers for this qualification, including the most recent assessments. Please note that we do not make past papers available on the public website until 12 months after the examination.	Portal by WJEC or on the WJEC subject page
Grade boundary information	Grade boundaries are the minimum number of marks needed to achieve each grade. For unitised specifications grade boundaries are expressed on a Uniform Mark Scale (UMS). UMS grade boundaries remain the same every year as the range of UMS mark percentages allocated to a particular grade does not change. UMS grade boundaries are published at overall subject and unit level. For linear specifications, a single grade is awarded for the subject, rather than for each unit that contributes towards the overall grade. Grade boundaries are published on results day.	For unitised specifications click here: Results, Grade Boundaries and PRS (wjec.co.uk)

¹ Please note that where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.

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Executive Summary

The entry is stable for foundation tier, with a small increase in the higher tier entry seen. The majority of the cohort sit the foundation tier. For the Year 10 exams a number of candidates appeared to be unprepared for the exams.

Candidates exhibit much better quantitative skills than qualitative skills.

The objective style questions at the start of the FT papers continue to be well received. Questions requiring longer responses candidates struggled with.

There were many examples of candidates not reading the questions carefully and / or taking note of information and instructions. Also missing out parts without answer lines even though they were in bold. Recall of knowledge (AO1 questions) continues to be an issue for many candidates.

The mathematical skills of candidates were generally good. However, some candidates lack basic numeracy skills. Graph work is satisfactory provided it is a straight line, curves tend to be more problematic. Some incorrect substitutions were seen and this highlighted that units hadn't been considered or converted properly, pence and pounds caused issues. Rearranging of equations proved to be more problematic than in previous series.

When information was presented to candidates for AO2 and AO3 questions, only the more able were able to interact with all the information provided and then use it in their answers. Concerns were raised that the understanding of some fundamental topics was very weak e.g. electrical circuits.

The literacy skills of the candidates highlighted a number of issues, frequent spelling, punctuation and grammar errors were seen. Also, the inability of candidates to communicate clearly and effectively was often seen e.g. incorrect terminology, vague responses. The presentation of responses often caused problems to examiners. When candidates were asked to give a qualitative response and to include data, often they didn't include data. The clear writing of numbers proved to be problematic e.g. 4 often looked like a 7 or 9.

QER questions continue to cause issues for many of the reasons listed above, namely the recall of knowledge and the literacy skills of candidates. The high unattempted rate is concerning.

Performance in the practical assessment unit was very good. The impact craters task proved to be very popular and this had the highest mean out of the three tasks. In all tasks, candidates found scaling graphs and plotting points with accuracy very challenging, lines of best fit were often very poor too. Candidates are familiar with the key practical terms but it is the application to a situation they tend to struggle with. Identifying inaccuracies and corresponding improvements were poorly done this summer, however the writing of plans was better than in previous years. Performance in practical questions on the theory written papers was not as good at times as in the Unit 3 assessment. Interestingly if these questions had appeared in the practical tasks it is likely they would have coped with them well, e.g. variables, anomaly, repeatability etc. It is the transfer of skills which is the issue. Questions which require analysis or evaluation of a practical technique they really struggled with.

Our digital resources website offers blended learning lessons and knowledge organisers, among other materials. Please ensure you are accessing the correct site with legacy resources (link [here](#)) and not the sister site for the new Made-for-Wales qualification.

SCIENCE (DOUBLE AWARD)

GCSE

Summer 2025

UNIT 1: BIOLOGY 1 – FOUNDATION TIER

Overview of the Unit

Topics assessed included:

- Cell structure and function
- The circulatory system
- Food tests
- Food webs, including data analysis
- Structure and function of alveoli
- Function of red blood cells and platelets
- Calculation of ratios
- Lung function – data handling and analysis, investigative design (QER)
- Determining energy content in sweets – experimental design and data analysis
- Photosynthesis and respiration

The first five questions and question 6 parts (a) and (b) were all at Low Demand. They were split into short sections calling for mostly short answers, simple arithmetic, or data plotting on a grid. In many cases, questions calling for specification knowledge (AO1) were supplied with prompts to facilitate recall, such as Cloze comprehension style word selection from a limited list of options (choice of one from three), or a 'tick box' exercise, again choice of one from three. Question 6(c) (QER) was heavily cued. Questions 7 and 8 were set at Standard Demand and thus somewhat more challenging.

Performance on this assessment was broadly similar to that seen in 2024. Once again, many candidates appeared to be underprepared to take the paper. Lack of even basic knowledge was widespread. There was also widespread failure to act on the cues provided, even though they were often emboldened. Therefore, many answers were irrelevant, confused or totally unintelligible. Spelling was often far off the mark. Limited vocabulary hindered many candidates, who appeared to struggle to express their ideas. Once again, a number of candidates were also hindered by illegible handwriting. This was due to failure to form recognisable letters or numbers, excessively small writing, or the use of pale colours, rather than black biro as instructed.

Comments on individual questions/sections

Question 1

No areas to highlight.

Question 2

A small majority of candidates correctly identified the vena cava on the diagram of the heart and that the pulmonary artery supplied the lungs. However, only around 10% of the candidates gave 'muscle' as the tissue that allows the heart to contract and relax.

Fewer than half the candidates scored all four marks in part (d) for giving the correct sequence for the flow of blood through the right side of the heart. This was particularly disappointing as the correct answer could be deduced simply by reference to the diagram, together with an understanding of the rules of basic grammar. Specification knowledge was not required.

Question 3

The answer for part (b) was provided in the first sentence of the stem of the question (in bold). However, only a very few candidates scored the mark, indicating, once again, that most candidates do not read text beyond the command words in questions.

Very few candidates showed any knowledge of the action of carbohydrase on starch in part (c).

Question 4

The table in (b) clearly shows a trend of declining DDT concentration in the eggs over the years. It was disappointing that fewer than half the candidates stated that in part I. Many answers were too vague, often just stating individual values. A common error was to state that the number of puffins and cormorants had declined. Both marks in part II could be gained by selecting the information in the food web and fact file, as instructed. Disappointingly the mean mark was just 0.5/2. Many candidates ignored the instruction and wrote vague or irrelevant explanations.

Question 5

The majority of candidates gained the mark in (a) for realising that gas A was carbon dioxide. However, very few gave one way that an alveolus is adapted for gas exchange. A common error was to state that the alveolus had *thick* walls.

Many candidates spotted the relatively low red blood cell percentage in (b)(i) and thus scored one mark. A few then went on to state that red blood cells carry oxygen for the second mark. However, many others were distracted and focused instead on the high proportion of plasma.

In 2024, it was reported that 'the function of platelets was unknown to many'. This lack of knowledge persists into 2025. Some candidates stated that platelets form scabs, which was not credited.

In (c) many candidates correctly totalled the number of red and white blood cells and gave the ratio as 10:2. Some went further and simplified the ratio to 5:1. There is considerable misunderstanding about the logic of ratio however. As a result, fewer than half the candidates realised that an increase in white cell count means that the ratio would decrease.

Question 6

Many candidates gained both marks in (b)(i) for accurately plotting all the points and a further one mark for a neat, clear and accurate line. Graph work is now generally done well.

Only a small minority of candidates scored both marks in (b)(ii) for describing the effect of age on peak flow in men. The answer: 'It peaks at 35' would have gained both marks. However, many confused or vague answers were seen. A commonly seen error was to state, for example, that 'the older you are the worse it gets.'

Many candidates scored for the comparison between men and women, however, value judgements such as 'men are stronger/better' were commonplace.

All the previous parts of Q6 were designed to prompt candidates before they tackled the QER in (c). In all, a total of nine points of Indicative Content were provided. A candidate who took seven of these points and used them in a coherent and grammatically correct account would therefore achieve a top band response, giving a minimum of five marks. However, while some candidates selected at least some of the points, very few candidates included seven. As usual, many answers were rambling, incoherent, ungrammatical and/or irrelevant. As a result, the mean mark this year remained stubbornly low at 2.3/6.

The remaining two questions were set at Standard Demand, although they were perhaps less challenging than in previous years. Though patchy, there were some very pleasing responses.

Question 7

In (a), A number of candidates scored all three marks for a correct calculation given to the nearest whole number. Many other candidates scored two marks for a correct calculation but not rounding it up. Several candidates gave good answers in part (ii)I, mentioning the tin, to reduce heat loss. A common error though was to state that the metal tin was a good conductor. A small majority gained the mark in part (ii)II for discussing an inherent inaccuracy in method B, such as 'shaking' or 'wobbly hands' altering the distance between sweet and test tube.

Somewhat surprisingly fewer than half the candidates gave 'fat/lipid/glycogen' in (b) as the form of excess energy storage.

Many candidates gave diabetes unqualified, rather than diabetes type 2 in (c), so did not score. Obesity or tooth decay were both commonly seen and gained credit. Other suggestions were generally too vague unless qualified, such as heart disease or mobility issues.

Question 8

In part (a), a number of candidates recalled that chlorophyll is the green pigment in plant leaves, and many gained one of the two marks available for correctly giving one half of the equation for photosynthesis. Several gained both marks.

Approximately half the entry gained the mark for correctly identifying the change in carbon dioxide concentration in (b)(i). Part (ii) was very challenging and, as expected, revealed the perennial problem that the majority of candidates at Foundation and many at Higher, do not understand the nature of respiration in plants. The most common error was to assert that there would be no respiration because light is required to respire. A few candidates stated that there would be respiration but then did not link that to the increase in carbon dioxide.

SCIENCE (DOUBLE AWARD)

GCSE

Summer 2025

UNIT 1: BIOLOGY 1 – HIGHER TIER

Overview of the Unit

This year's paper covered a wide range of topics from the double award unit 1 specification. The paper gave candidates the opportunity to demonstrate their skills and understanding of the subject in all three of the assessment objectives, mathematical and practical skills. Only a minority of candidates failed to attempt the questions, but the legibility of written communication was an issue for examiners, making it difficult to tease out any creditworthy responses.

Candidates performed well in the following topics/skills:

- Interpreting graphical information (Q3el, Q6bi).
- Plants and Photosynthesis (Q2a & bi).

Some candidates found the following topics/skill challenging:

- Applying knowledge and understanding to questions which require analysis or evaluation of a practical technique (Q3, Q5).
- In general, questions requiring longer responses (Q2bii, Q3c, 4biv, 5b, 6c) were not answered well, answers were often unclear and lacked precise use of biological terminology.

Comments on individual questions/sections

Question 1

Many candidates gained 3 marks in (a)(i) as they correctly completed the calculation and recognised that they were required to give their answer to the nearest whole number. If they did not round to the nearest whole number they gained a maximum of two marks. In part (ii) many candidates did not gain a mark because they did not provide enough detail in their response, for example 'A has a tin can around it' was not enough to gain a mark as there was no reference to insulation or trapping heat. Candidates found (ii) II more accessible and many referred to the movement of the hand. However, some responses simply stated that the sweet was held on a mounted needle which was not enough detail to gain the mark. Parts (b) and (c) required candidates to recall facts and the quality of responses varied significantly. In (c) many candidates did not qualify diabetes with the term type 2 to gain credit.

Question 2

Most parts of this question proved to be accessible for higher tier candidates. This is reflected in the high facility factors. Many candidates were able to recall the green pigment in (a) (i) and state the word equation for photosynthesis in (ii). Part (b) (i) was answered well, in (ii) many higher tier candidates failed to recognise that respiration will take place in the dark in plants.

Question 3

Much of this question assessed candidates understanding of practical skills in an unfamiliar context. In part (a) many candidates were able to recall part of the definition of an enzyme such as catalyst or describing a catalyst gaining one mark but few gained two marks. In (b) a number of candidates could identify variables, but few could explain the reasoning for repeating the experiment. In several cases candidates stated that repeating the experiment increased the accuracy of the experiment as opposed to the accuracy of the mean (by eliminating anomalies when calculating the mean). In (c) a lack of detail meant candidates did not gain marks. A common omission included reference to what is gaining kinetic energy as temperature increases. Part (d) proved to be one of the least accessible questions on the paper. Candidates regularly incorrectly cited 'human error' as an inaccuracy. It is worth noting that the inaccuracy should be linked to the experimental method or equipment used not human error. In (e) many candidates drew a correct line. One reason why candidates did not gain credit was that they omitted to show a decrease in number of bubbles, with a line continuing to increase or plateau. Of those who drew a line decreasing many were able to explain that this was because enzymes are denatured at high temperatures in (e) II. However, some candidates incorrectly stated that enzymes die at high temperatures.

Question 4

In (a) (i) whilst many candidates were able to correctly identify the chambers of the heart fewer could identify that X was the lungs with a number identifying organ X as the brain. In part (a) (ii) a common error included placing the letter G on an organ as opposed to a blood vessel. In II few candidates could correctly explain their reasoning for the placement of G. Poor quality of written communication meant that candidates responses to (iii) were often unclear. In (b) (i) and (ii) candidates were required to recall facts regarding the blood plasma. In some cases, marks could not be awarded as candidates used terms such as 'store' or 'contain' named substances as opposed to 'transport' or 'carry' them. Many candidates correctly completed the calculation in (iii) and gave their answer in standard form gaining full credit. In (iv) whilst some detailed answers were seen, gaining full credit, in many cases vague answers and lack of precise scientific language prevented candidates gaining marks.

Question 5

Part (a) I was the least accessible question on the paper with the lowest facility factor. In II a common error was the idea that blotting removes water from inside the potato as opposed to surface water. In (b) the mean mark for the QER was in the bottom band. Whilst some candidates were able to show an excellent understanding of osmosis, many answers often lacked clarity, referring to solutions moving by osmosis. Other responses did not refer specifically to the concentrations listed in the question.

Question 6

Part (a) required candidates to use the information provided to conclude that the larger surface area of bushy lichens means they can absorb more pollution. Lack of detail was why many candidates failed to gain credit as statements such as 'they are bigger' was not enough to gain the first mark point. For the second mark candidates were required to give more information than just restating information provided in the stem, 'they absorb molecules through their surface' unqualified was not enough. Part (b) (i) was answered correctly by many candidates who interpreted the information provided in Graph 6.2. In (ii) many candidates did not gain credit as they did not refer to sites or trees in their conclusion. In part (iii) reference to repeating unqualified was not enough to gain credit. Candidates were required to reference testing more sites. Responses to (c) varied and while a maximum of four marks were available the mean was only 1.1. Whilst many candidates understood the general principle of eutrophication, reasons why marks were not awarded were reference to growth of plants as opposed to overgrowth, blocking light or no photosynthesis due to overgrowth of plants but not both. Reference to oxygen being used up in respiration in the incorrect context, often linked to fish respiring.

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UNIT 2: CHEMISTRY 1 – FOUNDATION TIER

Overview of the Unit

The demand of the questions was comparable to that in previous series and the paper was a suitable and fair test for the candidates at foundation tier level. The degree of difficulty of the questions increased throughout the paper, with questions in the common section providing the most challenge.

The foundation tier only section of the paper was generally well attempted. The objective style questioning used in most of this section was accessible for all candidates. Despite this, many candidates lacked the basic knowledge and understanding of the topics assessed through these questions and therefore made random guesses.

Questions that required descriptions and/or explanations were poorly answered, particularly when they required direct recall of knowledge. This included questions relating to practical work. The question on flame tests and silver nitrate tests was particularly poorly answered.

Where candidates did demonstrate some knowledge and understanding, many gave answers that were either too vague or that did not specifically relate to the question.

Writing chemical formulae and equations are key skills in chemistry and therefore have a significant number of marks allocated to them in each examination paper. Only a small number of candidates were able to give the chemical formula of a named compound, insert a number into a box to balance a given equation or complete and balance a symbol equation. Candidates aiming for a C grade should have a basic grasp of these skills.

Questions that assessed mathematical skills were generally well attempted. However, too many candidates still lack basic numeracy skills.

The quality of graph work was good and most candidates were able to successfully plot points onto a given axis and draw a suitable line of best fit. However, a significant number of candidates joined the points plotted with a ruler, rather than drawing a curve.

The PISA-style question was well attempted. Most candidates were able to select the appropriate information to answer the questions.

The QER question was poorly answered with a significant number of candidates not attempting the question or only writing two or three lines. Three diagrams were provided to prompt candidates but the majority simply stated what was happening in each diagram rather than answering the question set. The majority were awarded bottom band marks with very few achieving middle or top band marks.

Comments on individual questions/sections

Question 1

- (a)
 - (i) Most candidates were able to select the correct answer.
 - (ii) Only about one in four gave the correct answer. The majority chose 'positive'.
- (b) The first part was well answered for the atom containing five electrons. However, a significant number of candidates mixed up group and period and as a result answered the second and third parts incorrectly.

Question 2

- (a) Almost all candidates correctly identified the apparatus from the choices given.
- (b)
 - (i) About two in three candidates correctly identified the statement from the choices given.
 - (ii) About four in five candidates correctly identified the processes from the choices given.

Question 3

- (a)
 - (i) Almost all candidates correctly drew the bar chart.
 - (ii) Most candidates correctly identified the hardest water sample with the correct reason. However, a significant number stated that the sample with most lather was the hardest water sample.
- (b) About two in three candidates correctly identified the advantage of hard water from the choices given.
- (c) Only one in four gave the correct answer. Most candidates chose adding fluoride.
- (d) The ions were given in this question to avoid candidates having to refer to the table at the back of the paper. Despite this, fewer than one in three gave the correct formula.

Question 4

- (a)
 - (i) The graph was correctly plotted by the majority of candidates. However, a significant number joined the points with a ruler, rather than drawing a curve through the points.
 - (ii) Only one in four candidates stated that the reaction finished between 4 and 5 minutes. As expected, the majority gave 'between 5 and 6 minutes'.
- (b) Most candidates showed good basic knowledge of why rate changes with temperature and many gained all three marks.
- (c) Poorly answered. A significant number of candidates failed to realise that there are four oxygen atoms in the formula of zinc sulfate.

Question 5

- (a) (i) This question required careful reading but it was very well answered with four in five gaining the mark.
- (ii) Reference to time was required here and more than two in three candidates gained the mark.
- (iii) Just over a half of candidates were able to calculate the correct mass here.
- (b) (i) Almost a half of candidates correctly balanced the symbol equation.
- (ii) This question was well attempted due to the percentage yield formula being given. The most common errors were using the mass of chlorine reacted and dividing 11.7g by 9.4g to give a yield greater than 100%.

Question 6

Poorly answered with most marks awarded being in the bottom band. The majority of candidates simply stated what was shown in each diagram rather than answering the question. Most marks were given for plants/trees evolving and carrying out photosynthesis which reduced carbon dioxide levels and introduced oxygen into the atmosphere. There were only a few references to the Earth cooling and water vapour condensing to form the oceans. Other ways of carbon dioxide levels decreasing, such as being absorbed by the oceans, being absorbed by shells of marine organisms or becoming locked in fossil fuels were not seen. A significant number of responses stated the effects of increased carbon dioxide levels in today's atmosphere and the effects of global warming.

Question 7

- (a) (i) Half of candidates gained this mark. The most common incorrect answers referred to a lilac flame and a 'pop' noise.
- (ii) Only one in five candidates gained this mark. Many gave an observation common to both metals, such as fizzing and floating.
- (b) (i) Poorly answered with most candidates failing to write the correct formula for potassium hydroxide. As is usual no mark was awarded for balancing when an incorrect formula was given.
- (ii) Two in five candidates gave an acceptable colour for the universal indicator at the end of the reaction. Red and yellow were common incorrect answers.
- (c) Although the diagram helped some candidates with this question, only just under a half gave a correct answer.
- (d) Just over two in three correctly identified that rubidium is more reactive than potassium.

Question 8

- (a) This was a more demanding chromatography question than usually seen but it was surprisingly poorly answered.
- (i) Only one in five gained the mark for the R_f value which required the distance travelled to be measured rather than read off a given scale. A significant number of candidates did not attempt the question suggesting that they did not have a ruler.
- (ii) Poorly answered. Very few candidates correctly interpreted the chromatogram. Most either stated that all four athletes had taken testosterone or nandrolone or that athlete A had taken most steroids because the spot for A had travelled furthest and that athlete C had taken least steroids because the spot for C had travelled the least distance.
- (b) Poorly answered. Very few candidates referred to ethanol boiling and then condensing. Any marks awarded were mainly for stating that ethanol and water have different boiling points.

Question 9

- (a) Poorly answered with a significant number of candidates referring to adding chlorine or filtration. They found it difficult to express themselves correctly when attempting to describe sedimentation, often referring to twigs, sticks and leaves which do not sink in water.
- (b) Generally well answered with most candidates stating that chlorine is added to kill bacteria in order to make water safe to drink. However, a significant number of candidates referred to chloride, fluoride or fluorine being added. A small number of gave 'chlorination' rather than chlorine which was not given credit since the question clearly asked for the **substance** added.

Question 10

- (a) (i) Poorly answered. Very few candidates stated that a yellow flame indicates sodium ions and that potassium ions give a lilac flame. A range of incorrect colours were given including pink, blue and white. Also, very few candidates indicated that a chloride ion gives a white precipitate with silver nitrate solution. A significant number did not attempt this question.
- (ii) Very poorly answered with 'potassium' being the most common response. Only a minority named a compound.
- (b) Well attempted with a significant number of candidates giving the correct formula for silver bromide and lithium nitrate. The most prevalent incorrect formula was Li_3NO , which comes from incorrect application of a common teaching strategy.

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UNIT 2: CHEMISTRY 1 – HIGHER TIER

Overview of the Unit

This paper turned out to be less demanding than the 2024 paper and candidates performed significantly better than they did last year. The degree of difficulty increased throughout the paper and the distribution shows a good spread of marks.

All parts of the paper were generally well attempted, including the most demanding questions. Very few candidates left questions not attempted.

Performance on questions that required descriptions and/or explanations was less good, particularly when direct recall of knowledge was required. Where candidates did demonstrate some knowledge and understanding, many gave answers that were either too vague or that did not specifically relate to the question.

Whilst most candidates were able to give the formulae of simple compounds, balancing was less well done. Significant teaching time should be invested in these skills as they have a good number of marks allocated to them in each examination paper.

Questions that assessed basic mathematical skills were generally well answered. However, fewer candidates were able to calculate a simplest formula from composition data.

The quality of graph work demonstrated by candidates was good and nearly all were able to successfully plot points onto a given axis and draw a suitable line of best fit.

As in previous years, the PISA-style question was well answered. Most candidates were able to select information from the article and table to answer the accompanying questions.

The QER question was better answered than in previous years with far fewer not attempting a response, despite it being based on challenging content.

Comments on individual questions/sections

Question 1

- (a)
 - (i) Although it was less of a problem in the higher tier paper, having no ruler caused an issue for some candidates.
 - (ii) A mean mark of lower than 50% on this question shows that some struggled to interpret the chromatogram correctly. Most identified that athletes **B** and **C** have taken drugs but many made no comment about **A** and **D**.
- (b) Well answered with most candidates correctly stating that ethanol has a lower boiling point than water. However, fewer stated that ethanol evaporates first and then leaves the flask before condensing back to liquid ethanol.

Question 2

- (a) Fewer than half of candidates correctly described what happens during sedimentation. Some referred to addition of chlorine.
- (b) Well answered by most but no credit was awarded for 'chlorination' or reference to chloride or fluoride.

Question 3

- (a)
 - (i) This was better done than on the foundation tier paper but the same incorrect answers were seen.
 - (ii) Again, many candidates gave 'potassium' or 'iodide' only rather than a compound name.
- (b) Very well answered.

Question 4

- (a)
 - (i) Very well answered.
 - (ii) Very well answered.
- (b) Many candidates incorrectly stated that a fluoride ion contains 9 electrons. Most correctly stated that a fluoride atom contains 10 neutrons.
- (c) Few candidates correctly stated the formula of iron(III) fluoride. Many of those who did went on to correctly balance the equation. Many gave the formula of iron(II) fluoride and therefore could not be given the balancing mark.

Question 5

- (a) Most candidates correctly stated that catalysts increase the rate of a reaction. However, only a few went on to state that they lower the activation energy. A significant number of candidates stated that catalysts give a reaction an alternative pathway but this alone was not quite sufficient.
- (b)
 - (i) Most candidates successfully plotted the points on the graph and drew a suitable curve.
 - (ii) Most candidates correctly described a simple relationship between the mass of starch and the time it took for the bouncy ball to harden. However, only a few candidates gained the second mark by explaining that the time decreased at a decreasing rate or that there was no further decrease in time after adding 0.5g of starch.
- (c) Most candidates correctly stated that the rate of reaction increased with an increase in temperature.

Question 6

- (a)
 - (i) Most candidates correctly stated Wegener's conclusion that the continents were once joined. However, fewer made reference to the fact that similar fossils were found on the two continents shown. A minority of candidates made reference to countries rather than continents.
 - (ii) Only one in five candidates stated that the living ammonites could move freely across the ocean. Those who referred to the fossils moving gained no credit.
 - (iii) About three in five gave a correct answer which was most often a reference to the jigsaw fit of the continents.
- (b) Most candidates gained credit for stating that plates move towards one another at a destructive plate boundary causing volcanoes, earthquakes or the formation of mountain chains. Only the strongest candidates referred to the more dense/less dense plate or described them as oceanic/continental. Reference to the 'heavier plate' was not credited.

Question 7

- (a) Most candidates picked the three statements that apply to a reversible reaction.
- (b) Most candidates gained credit for stating that increasing the concentration of a reactant results in more successful collisions between particles. However, fewer made reference to the fact that a higher concentration results in more particles being present in a given volume. A small number of candidates incorrectly stated that a higher concentration increases the kinetic energy of the particles.

Question 8

Poorly answered with a facility factor of 30%. Most candidates that gained credit stated that the number of electron shells increases on going down the group. A few correctly stated that it is easier to lose the outer shell electron in the elements towards the bottom of the group. Very few candidates referred to the decreased attraction between the nucleus and outer shell electron in the elements towards the bottom of the group. A significant number of candidates referred to either protons or neutrons in the outer shell.

Question 9

- (a) Most candidates correctly stated that limescale forms over time when temporary hard water is boiled in a kettle. Some of these candidates then went on to state that this makes a kettle lose its efficiency or that it takes longer for the kettle to boil. However, a significant number of candidates simply stated that hard water takes longer to boil than soft water which was not worthy of credit.
- (b)
 - (i) Many candidates knew that 'sodium' is exchanged for 'calcium' (or 'magnesium') but didn't get the mark because they made no reference to ions. Only one in five gained the mark.
 - (ii) Only about one in eight gave an acceptable answer. The most common incorrect answers were that the process takes too long or that it is difficult to set up the apparatus.

- (c) Well answered. Most candidates correctly calculated the mass of magnesium sulfate from the number of moles. The main error was in rearranging the equation given in the question.
- (d) Candidates had to work out the products formed in this question making it more challenging than earlier formulae questions on the paper. They did reasonably well and the facility factor was 46%. The most common incorrect formula seen was NaCO_3 .

Question 10

- (a) This QER question was attempted by most candidates with only a few responses not given any credit. Although the topic of Group 7 displacement reactions was challenging, the decision to include a table of results of reactions carried out with supporting information made the question more accessible.

A number of candidates were awarded middle band marks for stating the order of reactivity with correct reasoning, using the table of results. However, only a minority stated that these were all displacement reactions and very few attempted an equation. Even fewer gave correct symbol equations. This clearly limited the number of top band marks awarded.

Bottom band marks were awarded for responses where the candidate simply stated that chlorine reacts twice, bromine reacts once and iodine does not react at all.

- (b) Only a minority of candidates calculated the correct simplest formula of FeCl_3 . A significant number divided the relative atomic mass of each element by the mass given in the question in the first step of the calculation. Most of these gained at least one mark for following the correct method after the initial error. Some candidates treated this as a reacting mass question and gained no credit.

SCIENCE (DOUBLE AWARD)

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UNIT 3: PHYSICS 1 – FOUNDATION TIER

Overview of the Unit

The breadth of the course was examined in various styles, demanding that the candidates demonstrated their knowledge, application and analysis skills to answer the questions. There was no graph drawing required in this year's paper and mathematical competence was examined throughout the paper, increasing in demand with progression on the way through. There were lots of good attempts at many of the questions.

The poor quality of writing amongst a number of candidates rendered their scripts to be almost unreadable.

Fewer than 90% of candidates attempted any question part, which is disappointing.

Setting a new starting point in any particular question failed to draw the best responses, as was evident in questions 1(b)(iii) and 3(b)(ii).

The following points refer to aspects of the specification and candidates' responses:

- Understanding of basic electrical principles was shown to be better than at some times in the past as was evidenced in answers to question 2.
- A light touch was given to the questions based on heat transfer this year in questions 4 and 5 and the evidence is that understanding of absorption of heat radiation is improving. Question 5(a) examined heat transfer through the QER and it is pleasing to note that fewer candidates failed to attempt the question than has been the case in other years.
- Extended written responses were often weak as was evidenced in answers to Q3(b)(iii) and Q4(b)

Comments on individual questions/sections

Question 1

The terms amplitude and wavelength weren't understood very well, the value of wavelength, in particular, was often given as 4 m or 16 m. The error – carried – forward principle allowed for any error in answer to (a)(ii) to not adversely affect candidates in getting credit in part (b)(i). It would seem that part (ii) of (b) was not recognised as being under the umbrella of the information given at the start of that part. This was possibly compounded by having to turn the page to calculate the distance travelled using the given equation, possibly hindered by the fact that the speed had been given on the previous page.

Part 1(c) was not well answered.

Question 2

The question was answered well by the majority of the candidates, aided by the questions being sequential with the exception of the final part. The hint to use previous answers fell on stony ground with many who were unable to add the two required values.

Question 3

Part (a) was generally well answered but in part (b)(i) a number of answers were seen in which the voltages were written in descending numerical order in the boxes from left to right, in which case 1 mark was awarded.

In (b)(ii), underlining the correct phrase was often done well but in (b)(iii), many poor answers were seen. It was common to read of higher power from nuclear power stations than from other power stations as an advantage or that they emit carbon dioxide as a disadvantage.

Part (c)(i) required that candidates did two things well, identifying the renewable resources from the list and then successfully adding the power values given in the table. Mistakes were made on both aspects in the answers seen with only about one third of candidates getting the desired outcome correct.

The final part demanded that a fair comparison was made between the CO₂ emissions from coal and gas based on an equal power comparison. A good number of correct answers were seen, demonstrating good analytical skills.

Question 4

The structure of this question was appealing to the candidature from whom good responses were made to both parts of (a).

Part (b) however was found to be more testing, inviting free prose on the benefits to the environment from insulating homes in Wales. Often, the advantages of cost were quoted or the comfort in keeping the home warm in winter or in it **preventing** global warming. This part was not answered well.

Question 5

The stimulus given by the graph and diagram spurred candidates to answer this question on heat transfer by radiation. Many good answers were seen, with the most common mistake being the reluctance to use the word **radiation** in their answer and not calculating the temperature **rise** for each of the test tubes' waters. Frequently, the final temperature was quoted instead. The last part was poorly answered.

Question 6

This question was common with the higher tier paper.

The first part was often answered correctly and part (b) was done well in using the rearranged density equation that was given. The 3 kg of the plastic containers was often overlooked in this part. The mathematics involved in both parts of (a)(ii) was not well handled. The link between the figures 35 and 3 500 000 was not recognised by many.

In part (c)(i), candidates gained a mark for identifying that the 1995 washing machine used more units of electrical energy per wash than the 2010 machine but then lost marks with loose use of language on the consequences for the energy rating label.

Care and clear thinking were needed for parts (ii) and (iii). The costs based on the units used by the two machines needed to be calculated using an equation from page 2, which was often ignored. The 9 p saving per wash was then available to be carried into the last part of the question instead of starting the calculation from scratch again, but that was often missed. A multitude of different approaches were adopted for answering this part but to little avail by the foundation tier candidates by and large.

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UNIT 3: PHYSICS 1 – HIGHER TIER

Overview of the Unit

The paper gave candidates the opportunity to demonstrate their skills and understanding of the subject in all three of the assessment objectives. The paper was of comparable standard with previous series.

Questions allowed candidates to:

- demonstrate and apply their knowledge and understanding of scientific ideas, processes, techniques and procedures;
- analyse, interpret and evaluate scientific information and evidence, including making judgements and reaching conclusions;
- demonstrate their proficiency in substituting numerical values into equations and solving them, rearranging equations, analysis of data in graphical, tabular and diagrammatical forms.

The quality of extended response was assessed in a question that required knowledge of an experimental method, and answers lacked both knowledge and clarity, so most responses seen were in the bottom band. The quality of handwriting in a significant number of cases was poor, causing examiners to spend some considerable time in deciphering the wording.

Recall based questions tended to have lower mean marks than other types. Rearranging equations was one area of the paper that was often poorly done, with substitutions into incorrect equations costing candidates marks. The question on electrical circuits was very poor and an area of concern to examiners.

Comments on individual questions/sections

Question 1

This common question was usually better handled by higher tier candidates than foundation. Candidates had to compare two different washing machines, looking at comparative carbon dioxide emissions and cost. Many candidates struggled to interpret the presented data in (a)(ii) and despite being relatively simple, this was often incorrect. Similarly, in (a)(iii) few candidates realised that they needed to multiply their previous answer by 100 000 and started again redoing their previous calculation, often with errors. In part (b) most candidates were able to use the density equation correctly, but it was rare to award 3 marks here as very few realised that they needed to add the 3 kg on to get the total mass, perhaps because they did not read the question carefully. Weaker candidates cubed the volume given in the question. In (c)(i) responses were often too vague to be credited. In (c)(ii) candidates were expected to determine the money saved per wash, comparing one washing machine to another. Many errors were seen with units here, often with the given cost per unit converted into pounds, despite the question demanding an answer in pence. The final payback time comparison in (iii) was very poorly done.

Question 2

This question explored the electromagnetic spectrum. The definition of a transverse wave was not well known and few candidates attained credit in (a)(i), this being one of the lowest performing items on the paper. In (a)(ii) candidates were expected to produce a wave diagram from the information given. This was poorly done with many candidates unsure how to attempt this. Candidates would benefit from practising this skill to better understand how to determine wavelength and amplitude from a wave diagram. In (b)(i) candidates were expected to interpret the given section of the em spectrum, linking wavelength, frequency and energy. It was very common to see candidates identifying that UV has the shortest wavelength, perhaps due to problems with interpreting the negative indices in the values given. Similar problems appeared in (b)(ii) where candidates were expected to determine the highest frequency of the gamma rays in the diagram. Selecting the correct wavelength was problematic and rearranging was poor. Calculations often didn't yield the correct power of 10 despite a correct substitution. It was common to see incorrect rearrangement before substitution, costing the candidates a mark. Many candidates could not identify a common property of em waves in (iii), this basic recall again being a very low performing section of the paper. In part (c) many candidates attained 2 marks, forgetting to halve either the time or the calculated distance. Again, poor rearranging impacted many.

Question 3

This question was about the National Grid. Most candidates could identify a step-up transformer but explaining its role was less successful, with many attaining 1 of the 2 marks. A common error was to state that a step-up transformer prevents heat loss, rather than reducing it. In (b)(i) candidates were expected to determine the percentage of electricity imported to the grid by examining the provided data. Many determined that 1.2 GW was required but did not calculate this as a percentage. In (b)(ii) many correct responses were seen - many have obviously studied Dinorwig and its role in the National Grid.

Question 4

This question explored current electricity and included the QER. In common with recent series, the current electricity calculations were poorly done, and this was the lowest performing question on the paper. The QER in (a) involved the recall of an I/V characteristic experiment, and despite the prompt of the circuit diagram there were many poor responses or non-attempts. Answers worthy of credit often got no further than stating that they would use an ammeter to measure current and a voltmeter to measure voltage. Weaker responses just gave knowledge of circuits. Most candidates attained bottom band marks.

In (b)(i) candidates were expected to use values from the I/V graph to determine a resistance. Rearranging here was poor and many lost marks for not substituting first or using incorrect triangles. The unit of resistance was not well-known.

In (b)(ii) candidates were expected to read voltage values from the graph for the given current. It was surprising how poor the responses were here, with few attaining 2 marks. Common responses included 12 V or 6 V across each, with no evident use of the graph despite the clear prompt to do so. In (b)(iii) candidates were asked to state the voltage in the parallel circuit branch. This was not done well highlighting a poor knowledge of basic circuits. Similarly, in (ii) correct responses were rare, with few candidates realising that they needed to add the current through each branch to determine the total current in the parallel circuit. The final part of this question was beyond the scope of all but the most-able candidates and highlighted many misconceptions about current electricity. This was the worst performing clip on the paper.

Question 5

This question was set in a practical context. Many candidates attained well in (a)(i) although incorrect rounding or failing to remove the anomaly from their mean calculation, despite it being clearly indicated as anomalous, limited lots to 1 of the 2 marks here. In (a)(ii) many correct responses were seen. In (iii) most could identify that the results were most repeatable for an angle of 45° but often struggled to express why. The best responses used superlatives or referenced data such as the range or the uncertainty. In (a)(iv) poor use of data limited the marks attained, even though most interpreted the data correctly. The final part of this question expected candidates to suggest reasons why the results may vary between groups. Many sensible suggestions here gained credit, but weaker candidates just referenced issues with equipment not working correctly which were not credit-worthy.

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UNIT 4: BIOLOGY 2 – FOUNDATION TIER

Overview of the Unit

Topics assessed included

- Senses
- Cell division
- Adaptation
- Classification
- Biological control
- Disease and defence (QER)
- Quadrat sampling
- Control of blood glucose and diabetes
- Conservation
- Reaction times

The first four questions on Low Demand, were split into short sections calling for mostly short answers. Questions calling for specification knowledge (AO1) were generally supplied with prompts to facilitate recall, such as Cloze comprehension style word selection from a limited list of options, or a True/False exercise. The low demand questions were well attempted by most candidates. Standard demand questions incorporated the full range of AO skill areas as well as calculations, graph work and practical skills.

In general, the majority of candidates attempted all of the questions with very few leaving blanks. However, the quality of written communication was an issue for some candidates. If a word or words cannot be read then positive marking becomes very difficult, as exemplified in Q8a.

Some candidates answered incorrectly due to not reading the questions carefully as shown in Q1 and Q4a. This meant that candidates were not able to identify questions requiring comparative answers as in Q4, 6, 7 and 8. Overall candidates recall was satisfactory but their access to questions and answers was sometimes hampered by their lack of understanding and /or use of key terminology. Spelling of key terminology also limited access to marks. This affected success in Q2, 5, 7, 8.

The QER (Q5) was well attempted. Candidates seem to appreciate that they are expected to use the information provided to support their answers, as with this question on preventing the spread of influenza. It was good to see that many students used side headings which helped them to construct their answers more logically. As a result, many gained marks in the middle band. The limiting factor on this question was use of correct terminology. There were far too many using the term 'germ.' Sentence construction was an issue for some candidates.

Identification of variables in practical questions was answered relatively well by most candidates, as well as how to improve confidence in results. Candidates often struggled to link the purpose of the practical with the science behind the outcomes and therefore, were unable to draw a correct conclusion, impacting performance on populations in Q6.

Most candidates were able to correctly calculate an average and then use this value to estimate population size. However, the ability to calculate area proved challenging for some candidates. Plotting a bar chart with a given scale was performed successfully by nearly all candidates with only a few not attempting this at all, and some with limited plotting errors.

Comments on individual questions/sections

Question 1

Nearly all candidates attempted and gained marks on part (a). Marks were lost where candidates had not read the question properly and therefore wrote the name of the sense rather than the sense organ as requested. Nearly all candidates were able to access (b), a cloze question on the central nervous system with a high success rate.

Question 2

The presence of the diagram and the nature of the question style, true/false, made cell division more accessible to candidates, with the average mark in (a) being 2/3.

Part (b)(i) asked candidates to state the term for genetically identical organisms. It had a low facility factor and highlights that candidates are not learning key terms and definitions. The common incorrect answer was 'twins' rather than 'clones'.

There was a similar issue for (b)(i), not learning the meaning of key terminology. As ever, the spelling of mitosis needs to be correct.

Question 3

Nearly all candidates were able to pull the relevant information from the image to correctly identify the penguin's adaptations for the state purpose. Although there was a slightly lower facility factor for (b)(ii), the majority were able to correctly describe the term vertebrate as 'has a backbone'. Still some candidates answering with 'spine', which is not an accepted response.

Question 4

Part (a) was about what information scientists would need to find out and so answers needed to be phrased either as a question, eg, 'do they have any predators?' or what they may or may not do, eg. 'if they will kill the greyback beetle', 'if they can survive in the new environment'. Most marks were lost on this question due to candidates either just quoting the facts from the stem of the question about where cane toads originated from and why they were being brought to Australia, or they tried to write statements from the table of facts in (b), such as, 'cane toads will reproduce twice a year', 'cane toads don't have any predators'. Again, this comes down to reading the question carefully.

In (b), candidates were asked to provide reasons for why the cane toad outcompeted the native frogs using a table of information on the two. This question was generally answered well. Where candidates lost marks, it was because they failed to recognise that a comparative answer was required with regards to commonalities. Eg. 'Cane toads reproduce more often than native frogs', 'cane toads lay more eggs than native frogs'. Those who lost marks just copied out the statements from the table, eg 'cane toads lay 8000-30000 eggs'.

Question 5

98% of candidates attempted the QER with an average mark of 4. Candidates seem to recognise that they have to use the information they are provided with in their answer. More candidates are using side headings which helps them to organise their response.

Basic sentence construction is still an issue for many candidates, as is using the correct terminology. Despite being told that influenza is virus, many talked about bacteria and some wrote about bacteria and viruses in the same sentence. Credit was not given for the term 'germ' which was as the reason for many students not gaining top band marks.

Candidates were able to pick out the five descriptions of what to do to prevent spread of the virus which gave them access to the middle band. However, they were hindered from accessing the top band due to discussing methods of spreading 'germs'. Although there were some good descriptions of methods of transfer, candidates would have more easily accessed the four explaining indicative points if they had used the correct terms, eg aerosol transmission, contact, ingestion.

Question 6

Part (a) had a very low facility factor with nearly all candidates seeming to lack awareness that quadrats are placed randomly to avoid bias. Most referred to fair testing.

Calculation of the mean in (b) was correctly completed by the majority of candidates, although some still find simple mathematics challenging.

However, more candidates found calculating the area sampled challenging with the most common error being to add the two dimensions together rather than multiplying them.

Using the two previous answers to use the given equation to estimate population size was performed better with most accessing this mark.

Part (b)(ii) was poorly answered. Candidates did not seem to be able to apply their knowledge and understanding of factors affecting population size within the context of the question. Even with the stimulus of images 6.1 and 6.2, they failed to identify that camouflage was the prime factor. Those that did correctly identify this, struggled to express themselves and hence gave vague answers such as, 'easier to see' which was not linked the banded or unbanded snail. Once again, candidates were let down by not using key terminology such as, 'camouflage' or 'predators'.

Most candidates were able to suggest ways of improving confidence in results for this method in (b)(ii). Main confusion in response was due to candidates referring to using different locations rather than a larger sample area in the same place.

Nearly all candidates completed the bar chart in (c)(i) and plotted accurately, correctly using the scale provided. Would be good to see candidates using a ruler to draw the bars and this would aid awarding plotting marks.

Candidates found (c)(ii) challenging as they failed to identify that a comparative answer was required to show the difference in the bird population before and after the conservation method had been employed. They also needed to link this observation to why this would impact on the snails. Many simply wrote, 'birds eat snails', rather than, 'there were birds to eat the snails'.

Candidates found identifying control factors for repeating quadrat sampling challenging in (c)(iii). Some could find one factor but rarely two. Same location, time or year/season, time of day and weather were accepted. Most candidates would answer with same field but then may 'time' which was not specific enough to be credited.

Question 7

Most candidates gained 1 mark on (a) by correctly labelling X as 'pancreas releases insulin'. Spelling of pancreas was ignored as the word was provided for them so it was clear that it was the organ being named. Candidates tended to label Y as, 'liver converts glycogen to glucose'. This is probably as the statement in the previous box referred to the liver, so candidates just chose the 'liver' option statement rather than using their own knowledge to correctly choose, 'glucose converted to glycogen.' Due to both glucose and glycogen being in the same statement, glycogen had to be spelt correctly.

Most candidates achieved 1 mark in (b) as they were inclined to describe the graph of volunteer A completely independently, failing to make comparative descriptions to volunteer B. Again, candidates were not reading the question carefully as they were asked to use the evidence from the graph rather than general knowledge statements such as 'it takes longer to return to normal'. Although this is a correct fact, the graph of volunteer A did not return to normal at all. When using figures from graphs to describe, candidates must correctly read these figures.

Part (b)(ii) was a straight recall question on the colour change of Benedict's reagent which approximately half of candidates had not learnt. The usual reasons for not gaining marks in (b)(iii) such as 'exercise' rather than 'regular exercise', 'eat less sugar' rather than 'reduced carbohydrate/sugar diet' and candidates just writing 'insulin' which didn't answer the question. There was some confusion with EpiPens too.

Question 8

Approximately half of Foundation candidates lost the marking point in (a) due to poor handwriting and therefore either no capital letter for Milvus genus or an 'm' indistinguishable from lower case or the 'm' was the same size as the other lower-case letters used in the name. Candidates must write their capital letter clearly to enable positive marking.

A recall response for the definition of 'extinct' required in (b)(i). Foundation candidates understood what this term meant but struggled with their written expression, regularly omitting to mention 'species', whilst mainly describing 'permanent loss'.

Again in (b)(ii) and (iii), foundation candidates struggled recalling the correct terminology and their descriptions for methods were vague, often cobbling together words from different methods. General misconception that zoos are the equivalent of 'captive breeding'.

Foundation candidates seemed to lack confidence in their calculated answer to this percentage increase question in (b)(iv), often obtaining the correct answer of 69900% and then writing 699% or 69.9% on the answer line. The majority were able to correctly substitute the numbers into the provided equation, but would then forget to multiply by 100. Hence, calculating percentage change continues to be an issue.

Again candidates struggled to identify factors affecting population size so (b)(v) had a very low facility factor. When mentioning 'competition', candidates must state what is being competed for.

Question 9

More than half the foundation candidates who used the conversion graph, were able to obtain the correct value of 185 in (a)(i). Incorrect values were mainly due to not reading the scale correctly.

The Foundation candidates found (a)(ii) considerably more challenging than the Higher tier candidates. These answers required comparative statements and identifying trends in the results of the students with respect to the results of the teachers. Some candidates identified the correct trends and wrote comparative answers but used them to support the wrong hypothesis. The Foundation candidates often misunderstood the reaction time unit and hence thought that the higher the reaction time value the faster the reaction.

A number of candidates referred to catch distances rather than reaction times. There were the usual poor expressions of faster and slower times rather than longer or shorter, although this was not penalised.

Most candidates were able to identify control variables in (a)(iii), although a number of candidates quoted the age of the students despite being told they were all year 11 students. Candidates would benefit from being taught how to pick out or highlight control variables as they read through the stem of a question or method.

Part (b)(i) – stating the effect of alcohol on reaction times was answered reasonably well. Incorrect answers occurred where candidates talked about the effect of alcohol on the brain, rather than what the question had asked for, ie. the reaction time.

The answer to (b)(ii) required long term effects of drinking alcohol for which there was an extensive list of conditions. Reference to 'problems' was not accepted.

SCIENCE (DOUBLE AWARD)

GCSE

Summer 2025

UNIT 4: BIOLOGY 2 – HIGHER TIER

Overview of the Unit

This year's paper covered a wide range of topics from the double award unit 4 specification. The paper proved to be similar in demand to previous years. In general questions increased in challenge as candidates progressed through the paper, the exception being question 4 in which some sections had some of the lowest facility factors. In some cases, presentation of work and quality of handwriting made it difficult for examiners to decipher answers.

Candidates performed well in the following topics/skills:

- Questions assessing mathematical skills were answered well, with all except one question (Q5b) having a facility factor above 70% (Q3bii, Q7ai) and half over 80% (Q1aiv, Q2ai, Q3bi) demonstrating their accessibility.
- Questions assessing AO1 which did not require direct recall of definitions were answered well (Q2bi, Q2bii, Q6ai).

Some candidates found the following topics/skills challenging:

- Certain questions assessing AO1 (Q4al, Q4all, Q4c and Q5civ) were not answered well.
- In general, questions requiring longer responses (Q5a, Q6aii, Q7aiii and Q7bi) were not answered well, answers were often unclear and lacked precise use of biological terminology.
- Questions requiring candidates to demonstrate their understanding of AO3 were generally not answered well.

Comments on individual questions/sections

Question 1

While (a) was answered well on higher tier, the main reason for candidates not gaining credit was not putting a capital letter for the genus. Part (b) (i) (ii) & (iii) required candidates to recall information, enabling assessment of AO1. Higher tier candidates tackled these questions more successfully than foundation tier. Part (iv) required candidates to calculate a percentage increase using an equation provided. Again, this posed far fewer problems for higher tier candidates. Possibly because they were given the equation to perform the calculation.

In (v) candidates were required to apply their knowledge and understanding of factors affecting population size. This proved to be challenging for both higher and foundation tier candidates. A number of responses did not gain credit as they referred to competition without qualifying with what resources the organisms are competing for.

Question 2

Part (a) (i) did not pose any issues for higher tier candidates and had one of the highest facility factors on the paper. In part (ii) answers were sometimes vague, and terms such as 'better reaction time' did not gain credit. In a number of cases candidates incorrectly identified that a higher reaction time meant a faster reaction time. In (a) (iii) there was a large range of possible correct answers. The most common correct response referred to drop height of the ruler. In some cases, candidates failed to gain credit as they referred to age of the students when the question stem stated that the participants were year 11 students. Part (b) (i) & (ii) were answered correctly by a large number of candidates on higher tier. However, in (ii) vague responses using the term as 'liver problems' instead of 'liver disease' did not gain credit.

Question 3

This question had some of the highest facility factors on the paper, despite capture-recapture being higher tier only content candidates found most parts very accessible. In (a) the majority of candidates were able to give a correct definition of the term invertebrate.

In (b) many candidates were able to calculate the population size but fewer were able to use their answer to calculate the number of woodlice per m². In (iii) lots of candidates were able to correctly identify an inaccuracy and suitable improvement in this investigation. However, a number of candidates incorrectly stated an improvement would be allowing time for immigration/ emigration or breeding.

Question 4

In part (a) candidates were required to recall definitions of two key terms used in genetics. Whilst many correct answers were seen, there were lots of vague and incorrect answers. Part (b)(i) proved to be the least accessible question on the paper and had the lowest facility factor. Candidates were required to apply their knowledge and understanding of inheritance to an unfamiliar context. Part (ii) was answered well, but it is worth noting that candidates should use letters provided to represent alleles for a particular gene and not choose their own. In some cases, genotypes or sex chromosomes were put in the Punnett square instead of gametes. Part (c) required candidates to outline the process of DNA profiling. Many candidates showed that they could concisely describe the process. A common error seen was a description of DNA being separated into strands.

Question 5

The QER had an attempt rate of over 98%. The mean mark was at the lower end of middle band. Many candidates gave detailed answers which put them into top band, achieving 5 or 6 marks but a common omission was that candidates either described or explained the changes in blood glucose but their response did not cover both parts of the question. Part (b) had one of the lowest attempt rates on the paper. This may be because a written answer was not required, consequently candidates did not notice the question as there were no response lines. In (c) (i) a common error included comparing 2010 and 2018 but not the trend between those dates. In (ii) candidates were required to make a judgement and justify their reasoning. Many did not do both and so did not gain credit. In (iii) candidates were required to demonstrate an understanding that there is a link between obesity and type 2 diabetes. The term type 2 was required and lots of candidates did not gain credit as they did not include this. In (c) (iv) two correct responses were required for 1 mark. The main reason candidates failed to gain credit was due to vague answers such as 'change diet', 'exercise', 'jabs', 'drugs'.

Question 6

Part (a) (i) was answered well and the majority of candidates were able to give the complementary base sequence for the DNA sequence provided. In (ii) clarity of expression prevented some candidates from gaining higher marks. Whilst some candidates were able to clearly describe protein synthesis, a large number wrote that one amino acid makes a protein, or that the bases make the protein. In (b)(i) most candidates were able to identify the unknown effects on health of eating GM crops. General disadvantages such as production of superweeds did not gain credit as the question asked about concerns related to human consumption. In (ii) many candidates were able to refer to the information provided in the stem and identify two advantages of slowing ripening in tomatoes.

Question 7

The calculation in part (a) (i) did not cause any significant issues, reflected in the high facility factor. In (ii) whilst many correct responses were given, there were also many that referred to bacteria becoming immune to antibiotics. In some cases, candidates incorrectly referred to viruses despite the question stating that *Vibrio cholerae* is a bacterium. In (iii) there were many excellent answers, where candidates demonstrated their ability to apply their knowledge of natural selection to the context provided gaining full credit. However, common misconceptions seen were that resistance caused a mutation to take place, cholera mutates, weaker bacteria killed. Part (b) was answered well and candidates showed a good understanding of how vaccines work using correct scientific terminology. They were then able to apply their understanding to (ii) explaining why two doses of the vaccine would give longer term immunity to cholera.

SCIENCE (DOUBLE AWARD)

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UNIT 5: CHEMISTRY 2 – FOUNDATION TIER

Overview of the Unit

This paper proved to be less demanding than in previous years and the mean mark increased to a healthy 28.7. It was a suitable and fair test for candidates at foundation tier level. The difficulty of the questions increased throughout the paper, with questions in the common section providing the most challenge.

The foundation tier only section of the paper was generally well attempted. The objective style questioning used in much of this section was accessible for all candidates. Despite this, many lacked the basic knowledge and understanding of the topics assessed in these questions and therefore made random guesses.

Questions that required descriptions and/or explanations were poorly answered, particularly when they required direct recall of knowledge. This included questions relating to practical work.

Where candidates did demonstrate some knowledge and understanding, many gave answers that were either too vague or that did not specifically relate to the question.

As in previous years, few candidates demonstrated the skills required to write chemical formulae and equations. These questions continue to be poorly answered, despite being a key part of the assessment of chemistry and therefore having a significant number of marks allocated to them in each examination paper. Few candidates were able to give the chemical formula of a named compound, insert a number into a box to balance a given equation or complete and balance a symbol equation.

Questions that assessed mathematical skills were generally well attempted. However, too many candidates still lack the basic numeracy skills required to successfully access these questions.

The quality of graph work demonstrated by candidates was better than in previous years and most were able to successfully plot points onto a given axis and draw a suitable straight line. However, a small number of candidates had difficulty interpreting a scale where one small square represents 0.4g.

As in previous years, a significant number of candidates were unable to answer questions where they are required to recall or apply the basic knowledge and skills taught in Unit 2 (year 10). For example, many were unable to calculate the relative molecular mass of a compound given its formula.

The PISA-style question was well attempted. Most candidates were able to select information from the article to answer the accompanying questions.

The QER question was set on some straightforward content requiring little detailed recall. It was attempted by almost 93% of candidates and many good answers were seen.

Comments on individual questions/sections

Question 1

- (a) All parts were well answered but only just over a half of candidates identified pH 9 as a weak alkali in part (ii).
- (b) (i) Parts I and II were well answered but fewer than a half of candidates selected the correct formula for calcium chloride from the four options given.
(ii) Just under a half of candidates chose the correct pH change for the reaction.

Question 2

- (a) Almost a half of candidates recognised that iron oxide was the substance reduced during the reaction in part (i). There was no choice of answers given in part (ii) and only one in eight recalled why limestone is added to the furnace.
- (b) Almost a half of candidates were able to use the given information to select **B** as the correct statement. The most common incorrect choice was statement **D**.
- (c) Many candidates were able to give the correct symbol for copper but fewer gave MgO as the formula of magnesium oxide. Incorrect responses included Mg_2O_2 and MgO_2 . There were also a number of candidates who re-wrote the names of the products on the answer lines.

Question 3

- (a) Almost a half of candidates selected the instant cold pack as the correct answer.
- (b) Few candidates were able to choose the correct words to complete both sentences relating to energy changes during reactions but the facility factor of 54% suggests that most made one correct choice.
- (c) (i) Pleasingly nine out of ten candidates read the scale correctly and gave the correct temperature change. No error carried forward was applied.
(ii) About a half of candidates chose the correct calculation for the energy change of the reaction.
(iii) Only one in three candidates were able to identify the use of digital thermometer as the change that **would not** reduce heat loss. Incorrect responses were equally split among the other three choices suggesting that many candidates misread the question.

Question 4

- (a)
 - (i) This was better answered than ionic bonding questions set in previous papers and many candidates were able to give both the charge on the potassium ion and the electronic structure of the chloride ion. Responses that gained one mark were usually got it for the charge of the potassium ion only.
 - (ii) Just under a half of candidates were able to correctly insert numbers to balance the given equation.
- (b) This was better answered than covalent bonding questions asked in previous papers and just over a half of candidates gained the mark. The most common error was failing to complete the octet of electrons on the fluorine atom.
- (c)
 - (i) The majority gained both marks for the properties of the given nano-particles.
 - (ii) This question should not have been set on the foundation tier paper as it is identified in the specification as higher tier only content. All candidates were awarded the mark in order to ensure that none were disadvantaged by this error.
 - (iii) Very few candidates were able to choose the correct name for both structures as shown by a facility factor of 37%. More recognised diamond than fullerene. Some candidates drew two lines from each structure.

Question 5

- (a)
 - (i) A half of candidates completed the formula correctly in part I and the most common incorrect answer was C_8H_3 . Only one in three identified the bond as a covalent bond in part II.
 - (ii) Only one in three candidates selected the correct general formula for alkanes. The most common incorrect choice was C_nH_{2n} , which they will have been taught about for alkenes.
 - (iii) Three in four candidates were able to complete the structure of pentane. Those who didn't get the mark omitted some bonds or some hydrogen atoms or included a double bond.
- (b)
 - (i) The facility factor for this question was a surprisingly low 33%. Very few candidates chose the correct words to complete all three sentences. The most common errors were putting the words 'monomers' and 'polymers' the wrong way around and choosing 'two' or 'four' instead of 'many' as the number of ethene molecules that join together.
 - (ii) Three in five candidates were able to select the correct monomer.
- (c)
 - (i) Only three in ten candidates selected the correct observation suggesting that the majority guessed the answer here.
 - (ii) Very few candidates were able to calculate the relative molecular mass of the given compound. This is a very simple skill but covered in Unit 2. Some candidates still appear not to realise that some key year 10 content is assessed on this paper.

Question 6

This QER question was attempted by most candidates with only a few responses not given any credit.

The fire triangle topic was well suited to the ability of the candidates, and this, together with the use of photographs to show the different firefighting methods, provided some scaffolding to assist them.

Some candidates were awarded top band marks for being able to describe the fire triangle, explain how it is used in each of the firefighting methods and give an appropriate example of a fire that uses each method.

Middle and bottom band answers were awarded where candidates:

- did not refer to all three of the firefighting methods shown
- did not give examples of fires that are put out using each of the firefighting methods shown
- did not fully explain what is meant by the fire triangle – either that fuel, heat and oxygen are all needed for a fire to burn or that removing one of these components puts out a fire

No credit was awarded for describing what is shown in the photographs.

Question 7

- (a) (i) Only one in eight candidates named this as a displacement reaction. No credit was awarded for redox, competition or exothermic.
- (ii) The facility factor of 83% shows that the graph was generally well done. Those who lost a mark usually did so by misinterpreting the scale on the y-axis where one small square represents 0.4g. Some lost a mark because they did not have a ruler to draw the required straight line. Some weaker candidates attempted to draw a bar chart. Most candidates were able to read a value from the graph in part II but fewer than a half correctly worked out the mass in part III.
- (b) Very few candidates were able to complete and balance the equation. Unusually, due to the exact layout of the partially completed equation, the balancing mark could be awarded even if the formula given for copper(II) sulfate was incorrect. Most who scored one mark only did so for adding a 2 in the box.

Question 8

- (a) Very few candidates were able to correctly identify all six statements as being true or false. However, nearly all were able to identify at least two of them.
- (b) This was not well answered and only a minority of candidates were able to refer to zero exhaust emissions. No credit was awarded for vague statements such as 'doesn't produce carbon dioxide'. Acceptable answers undermining the claim were usually linked to the manufacture of the cars or charging their batteries.
- (c) Many candidates were able to use the data from the table to calculate the running cost per mile of the electric car over a three-year period. A significant number lost a mark by failing to convert the answer from pounds to pence.

SCIENCE (DOUBLE AWARD)

GCSE

Summer 2025

UNIT 5: CHEMISTRY 2 – HIGHER TIER

Overview of the Unit

The demand of this paper was slightly lower than in previous years and the mean mark of 25.1 was about 3 marks higher than each of the last three years. It was a suitable and fair test for candidates at higher tier level. The degree of difficulty increased throughout the paper, with the most challenging questions towards the end.

Almost all parts of the paper were attempted by almost all candidates.

Performance on questions that required descriptions and/or explanations was sometimes poor, particularly when direct recall of knowledge was required. Where candidates did demonstrate some knowledge and understanding, many gave answers that were either too vague or that did not specifically relate to the question.

Whilst most candidates were able to give the formulae of simple compounds and insert a number into a box to balance a given equation, very few demonstrated the ability to bring all these skills together to successfully complete or write full symbol equations. Significant teaching time should be invested in these skills as they have several marks allocated to them in each examination paper.

Questions that assessed basic mathematical skills were generally well answered. However, as in previous years, many candidates had difficulty with calculations specified in Unit 2. Some still appear not to know which key year 10 content can also be assessed in the Unit 5 paper. This includes flame test colours and the colours of silver halide precipitates.

The quality of graph work demonstrated by candidates was good and nearly all were able to successfully plot points onto a given axis and draw a suitable straight line.

As in previous years, the PISA-style question was well answered. Most candidates were able to select information from the article to answer the accompanying questions.

The QER question was better answered than in previous years with only 6% of candidates not attempting it. The decision to include a diagram with supporting information made the question more accessible and it was good to see that a significant number scored middle or top band marks.

Comments on individual questions/sections

Question 1

- (a) (i) This question was better answered than on the foundation tier paper and three in five candidates recalled that this is a displacement reaction.
- (ii) The graph was plotted very well and five out of six candidates accurately read off the graph to gain the mark in part II. Two out of three also gained the mark for the slightly more challenging part III.
- (b) This was well done and the majority gained both marks.

Question 2

- (a) This question was better answered than on the foundation tier and more candidates were able to correctly identify all six statements as being true or false.
- (b) This question was better answered than on the foundation tier and more candidates were able to give a balanced response to the statement that 'Electric cars do not contribute to global warming'. There were again many vague statements and the facility factor was slightly less than 50%.
- (c) This was well answered and only a small number failed to convert the answer from pounds to pence.

Question 3

- (a) Many candidates were able to complete the dot and cross diagram to show the ionic bonding in magnesium fluoride. The scaffolding within the question made it more accessible and responses were better than those seen in the more traditional style questions set in previous papers. Some lost a mark needlessly through not showing the transfer of electrons on the top diagram.
- (b) Most candidates were able to explain the electrical conductivity of metallic substances in terms of delocalised electrons. In contrast, very few were able to explain the electrical conductivity of ionic substances in terms of free moving ions in the molten state or when dissolved.
- (c) (i) The facility factor of 51% was lower than that for the ionic bonding question. This is a slightly more difficult example than is sometimes used as it involved two double bonds. No credit was given unless two shared pairs were shown on both sides of the carbon atom. Most scored either 0 or 2 marks.
- (ii) The facility factor here was only 24%. Very few candidates were able to explain the low melting point of carbon dioxide in terms of weak intermolecular forces needing little energy to be overcome. Vague references to 'weak bonds' gained no credit. The most common incorrect answers referred to 'weak bonds within molecules' or 'weak attraction between ions'.
- (d) (i) Most candidates were able to link the given uses of nano-scale silver particles to them being antibacterial but there was evidence of poor revision with properties of other nano-scale materials and even smart materials being given commonly.

- (ii) Many candidates were able to recall the concern that nano-scale particles can easily enter the body and link this to the long-term effects being unknown but vague language, such as stating that they are 'harmful', again resulted in marks being lost. The facility factor was a surprisingly low 37%.

Question 4

- (a) (i) Only about one in three gave the general formula for alkanes in part I. Many gave the equivalent for alkenes. Some lost the mark for strange formatting such as including a + symbol between the C and H symbols. A similar proportion gained the mark in part II by referring to compounds without a carbon-carbon double bond. Poor expression and lack of clarity again cost marks as statements such as 'alkanes have single bonds' and 'the carbon in alkanes have four bonds' were not credited.
- (ii) Only around one in three correctly gave the meaning of the term isomer. Lack of clarity again resulted in lost marks, e.g. 'compounds with the same number of atoms but arranged differently' was not sufficient. About one in three drew the correct structure of the third isomer in part II.
- (b) (i) About one in three gave the expected observation in part I. Some lost the mark for referring to the solution becoming 'clear' rather than 'colourless'. Parts II and III were the worst answered questions on the paper with facility factors of 15% and 9% respectively. This is straight recall although challenging for GCSE students. Polymerisation was the commonest incorrect answer in part III.
- (ii) Very few candidates were awarded full marks for this question. This is again challenging but it is a familiar recall question. Where credit was given, this was usually for drawing the correct repeating unit of the polymer. Explanations often contained irrelevant information or did not specifically describe the 'double bond breaking' or how the monomers are able to 'join together'.
- (c) (i) The majority of candidates were able to use the given information to calculate the energy released in forming an O—H bond. The facility factor was a very pleasing 74%. Incorrect answers were usually a result of mis-counting the number of C=O or O—H bonds so candidates were awarded error carried forward marks for correct steps in the method.
- (ii) Only about one in four candidates correctly gave the energy needed to break all the bonds in the reactants. Many carried out additional steps after finding the required value and lost the mark.

Question 5

- (a) Few candidates were able to complete the equations for all three of the given reactions and the facility factor was 38%. More were able to give the correct formula for hydrogen gas (in equation 1) and sodium sulfate (in equation 3), than for nitric acid (in equation 2). Common errors included 2H for hydrogen gas, HNO for nitric acid and NaSO₄ and Na₂(SO)₄ for sodium sulfate.

- (b) (i) This question was poorly answered. This is disappointing as the method should be very familiar from practical work and from previous exam papers. Although a number identified the need to add excess zinc carbonate powder, they often failed to name sulfuric acid as the other reactant. Responses that described the filtration stage without having described the first stage were not given credit.
- (ii) About one in four candidates stated that the evaporation would need to be carried out slowly in order to produce large crystals. This was implied in a number of ways, e.g. leave overnight. Credit was not given to responses that referred to leaving it in a warm place without there being any reference to time.
- (c) (i) Few candidates were able to calculate the formula of iron(II) chloride and conclude that neither student was correct. This is based on content from Unit 2 which may not have been revisited. Similar questions have been set on recent papers so it should not have been unexpected. Unit 5 content on metals and their extraction offer good opportunities to practise this type of calculation as part of the teaching. Where candidates understood the method needed, the most common errors were dividing the numbers the wrong way around in the first step and not expressing the numbers in the simplest whole number ratio.
- (ii) Only around one in four gained the mark in part I. It is simple recall but again from Unit 2 content. A similar number chose the correct ionic equation for the formation of silver chloride in part II.

Question 6

This QER question was attempted by most candidates with only a few responses given no credit.

Although the topic choice of the reactions inside the blast furnace was challenging, the decision to include a diagram with supporting information made the question more accessible to candidates.

A significant number of candidates were awarded top band marks for explaining the role of each of the three identified reactions and giving relevant equations.

Middle and bottom band marks were awarded where candidates:

- only discussed one or two of the identified reactions
- did not give more detail than is included in the diagram
- got the identified reactions mixed up e.g. reaction 1 producing carbon monoxide
- included incorrect information in relation to one or more of the reactions e.g. reaction 3 uses limestone to produce slag
- did not include relevant equations for each of the reactions
- gave inaccurate equations for one or more of the reactions

SCIENCE (DOUBLE AWARD)

GCSE

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UNIT 6: PHYSICS 2 – FOUNDATION TIER

Overview of the Unit

The exam paper included questions set from each of the topics from Unit 6 and were based on all three assessment objectives so tested recall of knowledge, (40%), application and understanding of knowledge, (40%), and analysis, interpretation and evaluation of information (20%). Questions from the stars and planets topic were done well in question 1 where multiple choice was given but questions from the types of radiation topic (question 6) were not answered well.

Similar to previous series the challenge in early questions in the Foundation tier was eased to allow more accessibility to candidates. This was shown by the high attempt rate in early questions in the paper, but the level of challenge increased through the paper with fewer candidates successfully answering the common question where a greater understanding would be expected.

Some candidates missed key instructions in the question such as using data in 3(a)(ii) and to complete the graph in 4(b)(iii).

Where recall was required, candidates found questions difficult. When given multiple choice the attempt rate was better, but many did not select the correct term or definition such as in 2(a) and 3(c)(ii) but when not given terms to select definitions were poorly answered such as in 4(b)(ii) and 6(b)(iii). Where recall was required in more extended writing questions such as 4(c)(ii) and 5, answers were often vague and confused and rarely showed good recall or understanding of the topic. Where candidates were required to apply skills, questions were answered better. Plotting the graph in 3(a)(i) was done well but interacting with information from the graph was more difficult. Questions involving using equations or calculations such as 4(c)(i) were done better than questions where descriptions or explanations were required.

Comments on individual questions/sections

Question 1

This had the highest attempt rate on the paper reflecting the easing of the challenge in early questions in the Foundation tier.

(a) Candidates were able to select the correct numbers from the diagram to answer the questions for 1(a)(i) and (ii) but some attempted to name the planets for (iii) rather than following the instruction to use the numbers 1-8. Part (b) was reasonably well answered with a mean mark of 2.1 showing that candidates were able to recall some definitions about stars and planets when given multiple choice to select from.

Question 2

Part (a) required recall of definitions of gamma emission and of half-life, despite being given the terms to select this was not answered well with a mean mark of 1.

- (b) This required application of skills including using a graph and calculating half-life. Many candidates did achieve full marks but often candidates were not able to apply understanding to half-life calculations. Part (i) required understanding that activity would half after 1 half-life, the mean mark was 0.6 so more than half of candidates were able to do this correctly, but many attempted to halve the wrong value e.g. halving 60 to 30. The second part required candidates to use the graph to find the half-life, half the candidates were able to do this correctly, but many did not understand the meaning of half-life attempting to halve values from the graph.
- (b) (ii) The attempt rate was lower for this question than others early in the paper but many candidates did show clearly how to calculate the mass remaining after 2 half-lives, using a sequence of halving and showing clearly using numbered arrows to show how many times it was halved. One common error seen was calculating that 0.4 halved to 0.2 after 1 half-life but then subtracting 0.2 for the second half-life to give an answer of 0 rather than halving a second time. Many candidates did not understand how to attempt a half-life calculation and simply multiplied the values given in the question or attempted other calculations.

Part (c) was not well answered despite having a high attempt rate. Understanding that the half-life of a substance does not change was not well known. Some candidates rewrote the same statement that is noted as incorrect in the question.

Question 3

Application of skills in question 3 was done better than questions where recall was required.

Part (a)(i) had the highest facility factor on the paper showing a good application of graph skills. Most candidates were able to correctly plot the points and use a ruler to join the dots. A small number of candidates did not use a ruler so were not awarded a mark for the line. Others attempted to draw a line between each pair of points before moving the ruler to draw a line between the next pair of points resulting in a disjointed line. A small number of candidates did not understand the scale used and plotted the points (150,1.5) and (250,2.5) incorrectly; these points were plotted 5 small squares above 1 and 2 rather than recognising that the scale had 0.5 as 10 small squares.

- (a) (ii) Was not answered well. Few candidates recognised the instruction in the question to compare an increase in mass to the increase in weight and compared the factor connecting the mass to the weight such as stating the weight was 10 times the mass. Many candidates ignored the instruction in the question to use data from the graph so were not awarded any marks. Others did not answer the question fully by not stating whether they agree or disagree with the statement so were not awarded full marks.
- (b) (i) Required candidates to use information from the table to convert 150 g to a weight of 1.5 N; very few did this correctly. Many candidates attempted to use an equation instead.

- (b) (ii) Required candidates to recall that acceleration required a bigger force, this was done correctly by a majority of candidates.
- (iii) Required candidates to calculate a resultant force by subtracting the weight from the diagram from the thrust shown on the diagram. Very few candidates were able to do this. Nearly all candidates attempted to use an equation to calculate the resultant force using $F = ma$ despite not being given any value of a in the question.
- (iv) Required candidates to substitute their answer from (iii) and divide by the mass given in the question so it was common to award 2 marks applying ecf for this part. It was very rare to see an attempt to convert the mass from g to kg before calculating the acceleration so the 3rd mark was not awarded.
- (c) Required recall of Newton's third law. Many candidates were able to recall that the direction of the pair of forces were opposite and were able to state that the force on the rocket was upwards but less than half recognised that they were equal.

Question 4

- (a) Had a mean mark of 1.6 showing that many candidates were able to correctly describe the motion shown by the speed-time graph. The common errors were with candidates who had confused speed-time graphs and distance time graphs and stated that B-C was stationary. Or candidates who did not understand that the straight line meant that the acceleration was constant; often these candidates were awarded 1 mark for constant speed between B-C but had stated that A-B had an increasing acceleration because the gradient is positive and a decreasing acceleration in D-E because the gradient is negative.
- (b) (i) Required interaction with the graph to select values to substitute into the equation. Most candidates were able to select the correct speed; 15 m/s, but selecting the correct time was more difficult for many. Many candidates selected the time at C or at D rather than the time between C and D. Some had difficulty reading the scale and counted 3 small boxes but used a time of 0.3 s rather than 0.6 s.
- (ii) Candidates did not recall the term thinking distance, some were able to recognise that it depended on reaction time and gave that answer but many selected terms from the box in part (a).
- (iii) Had the lowest attempt rate on the paper; many candidates missed the instruction to complete the graph. Many that did attempt the graph recognised that the reaction time would be longer and correctly added a longer horizontal line but then did not realise that the braking distance would be unchanged and had a shallower gradient for that part of the graph. Some candidates attempted to write on their graphs in order to explain the difference between the graphs but without attempting to show the how the graph would be different correctly were not awarded a mark.
- (c) (i) Was a simple substitution and calculation and done well by most.
- (ii) Required recall of how crumple zones work and was poorly answered by most. Many responses were vague and confused about how they work, and some candidates used crumple zones as a term synonymous with safety features and described air bags and seatbelts.

Question 5

The QER required recall of the next stages in the Sun's life cycle. Some candidates were able to recall the names of the next stages but were often confused and mixed with the stages in the life cycle of high mass stars. Few candidates were able to describe the process involved in terms of forces and fusion and repeated parts of the question rather than describing the changes in the forces.

Stars and planets is a topic where some candidates show enthusiasm about the subject and were able to recall some information but did not answer the actual question. Some attempted to describe the stages in a high mass star or described the formation of the Sun. Others had learned other information such as rocky or gas planets and answered their own question.

Question 6

This was the common question many FT and HT candidates found it difficult.

- (a)
 - (i) Very few candidates were able to recall that rocks caused the difference in concentration of radon.
 - (ii) Required the interaction with the diagram and the pie chart and no recall was required so this was answered better than other parts in question 6. Many candidates were able to recognise that F3 had less radon than B2 and some were able to describe that the radon section of the pie chart would be smaller. Few candidates on the FT described the effect on the other sections.
 - (iii) Very few candidates were able to recall that radioactive decay is random and were unable to explain why increasing the time would give a more accurate reading.
- (b)
 - (i) Few candidates were able to interact with the information to recognise that radon was an alpha emitter and fewer were able to explain why this means it could cause cancer.
 - (ii) FT candidates had difficulty with balancing the equations and were unable to calculate the numbers or use the correct symbol for alpha despite it being shown in the diagram.
 - (iii) Very few candidates were able to recall the term "isotopes".
 - (iv) Very few candidates were able to calculate the number of protons and neutrons to draw a conclusion here. Many candidates did make a conclusion but did not apply any understanding to show why.

SCIENCE (DOUBLE AWARD)

GCSE

Summer 2025

UNIT 6: PHYSICS 2 – HIGHER TIER

Overview of the Unit

The exam paper included questions based on all three assessment objectives so tested recall of knowledge, (40%), application and understanding of knowledge, (40%), and analysis, interpretation and evaluation of information (20%).

The degree of difficulty of questions increased throughout the paper. Most question parts had very high attempt rates. Candidates need to take more care in reading the questions and taking note of information in tables and diagrams.

The performance of candidates in recall questions tended to be weaker than in non-recall questions. This is evident in questions that required descriptions and/or explanations. This is nothing new and has been commented on in exam reports for several series. This was particularly evident in questions relating to practical work. Where candidates demonstrated some knowledge and understanding, many answers were vague or confused and sometimes did not relate exactly to the question asked. This should cause concern since 40% of the questions are based on recall.

Questions that assessed mathematical skills were generally well attempted with some candidates gaining full marks. Some questions required equations to be rearranged and this caused problems for some candidates. There is still a group of candidates that substitute incorrectly into given equations. They do not consider units during the substitution process. It is emphasised that workings should be shown in the provided spaces when answering calculation questions. Marks are often provided for selection of values and substitution. These marks cannot be awarded if all that is shown is an incorrect answer on the answer line. Many candidates lost a mark for not giving their answer to a calculation to two significant figures. It must be mentioned that it is becoming increasingly difficult to differentiate between certain numbers in answers particularly 1, 2 and 7.

Responses to the QER question were poor. It should be noted it depended on recall. Too many responses are difficult to read.

Comments on individual questions/sections

Question 1

- (a) (i) A minority of candidates knew that the variation in radon levels is due to differences in the rocks present in a location.
- (ii) The majority of candidates scored 2 out of 3 marks here. They referred to the map and stated the effect on the radon segment of the pie chart of a lower radon concentration at F3. Most lost a mark for not understanding how this would affect the other segments.

- (iii) This part was not answered well. Few responses referred to the randomness of radioactive decay.
- (b) (i) Less than half of candidates stated that radon is an alpha emitter. Fewer referred to its highly ionising property.
- (ii) This was poorly answered with only a small minority of candidates achieving 2 or more marks. The decay series showed that polonium was an alpha emitter but it was common to see the symbol for a beta particle inserted into the top equation.
- (iii) The term isotopes was known by less than half of candidates. About 15% of candidates did not attempt to give an answer.
- (iv) Answers were very poor. Few candidates could use the symbols Pb-210 and Pb- 214 to compare the numbers of neutrons and protons in the atoms of these isotopes.

Question 2

Some textbook examples of how to present answers were seen. Clear workings are shown and they are well set out.

In each part that required it, the recommended order of carrying out calculations is:

- Write down the equation
- Make substitutions
- Rearrange
- Complete calculation

When candidates do not adopt this style mistakes are frequently made. Too often the first step shown is an incorrect rearrangement of values which earns no credit.

- (a) Most candidates scored well in both parts of this question. They were able to interpret the photographs and complete the calculations correctly. However, a common error was multiplying 1.5 m by 6 rather than 5. This arose from a count of the number of white lines rather than the spaces between them. In part (ii), some candidates calculated the speed of the car and failed to determine how much over the speed limit this speed was. Others thought a photograph was taken as the car passed every white line so used an incorrect time in the speed calculation. Candidates need to read questions carefully. There is still a group of candidates who substitute incorrectly into equations showing a disregard of units.
- (b) (i) Most candidates performed well here. However, errors in rearranging the speed equation were evident. Also, substitution errors appeared again. A lack of careful reading was evident since some candidates did not use the TLR thinking distance for a speed of 14 m/s and others used data from the highway code instead.
- (ii) Responses were poor. Very few candidates could reason whether the length of the zig-zags was sufficient. No data was provided in the table for a speed of 8.9 m/s but there was for 11 m/s and candidates were expected to realise that the thinking distance would be less than 17 m. The braking distance of 6 m given in the question was usually ignored.

- (c) (i) This was a recall question and few complete statements of Newton's First Law were seen. Some answers omitted to state the motion is uniform. Others omitted to say the constant speed must be in a straight line. Responses that did not refer to 'at rest' or 'resultant force' were also seen. Some candidates attempted to state Newton's Second or Third Law.
- (ii) The most common reason for awarding a mark was due to statements that seat belts prevent continued motion through the windscreen in an accident. Most candidates ignored the instruction to explain how Newton's First Law applied to seat belts.

Question 3

Both parts of this question required recall of knowledge. They were not answered well.

- (a) The QER question was based on knowledge of the life cycle of large stars. The required explanation required descriptions of fusion, super giants, supernovae and recycling elements. There were inaccuracies such as the life cycle progressing from nebula to main sequence stars to red giant then white dwarf. There were no references of super giants or supernovae. There was also a lot of detail about forces which was not relevant to the question.
- (b) Few candidates could explain why main sequence stars are stable in terms of forces.

Question 4

- (a) (i) A minority of candidates were able to give a full explanation. The statement in the question included '5.3 years' and this value was required in the answer however it was not always included. Frequently, responses did not give an acceptable property that would halve.
- (ii) Even when the correct radioisotope was selected the reasoning was flawed. Usually an incorrect radioisotope was selected and it was clear from the reasoning that these candidates did not understand the purpose of a tracer.
- (b) (i) A minority of candidates succeeded to determine the time. These were able to work out the number of half-lives to reduce to $\frac{1}{32}$ correctly. Not all continued to work out a time. Some proceeded to divide 59 by 32, instead of showing a sequence of halving. It should be noted that when producing a half-life sequence, some candidates count the numbers and not the arrows/intervals so producing an error.
- (ii) This was a novel question and was answered poorly. Few candidates engaged with the information in the table and were unable to apply their knowledge to the given situation.

Question 5

This question was based on a specified practical so it was assumed that candidates would have done this experiment during the course.

- (a) Both parts were related either to the method or to the analysis of results. Both were answered poorly and in the case of part (ii), very poorly.
- (b)
 - (i) A minority of candidates recognised the significance of points for spring 1 all being on the line.
 - (ii) This part was better answered than the previous parts. The usual errors in substitution and rearranging were seen. In this calculation some candidates lost the final answer mark because they either ignored the instruction to give their answer to two significant figures or did not know how to do that.
 - (iii) & (iv) The first two parts were poorly answered with a massive improvement in part (iv)II. This was probably due to the required equation being given in the final part and because an ecf was allowed. Many candidates selected an incorrect equation from page 2. They also misread the question and selected data for spring 2, when the question clearly stated earlier on that spring 1 was used.

SCIENCE (DOUBLE AWARD)

GCSE

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UNIT 7- PRACTICAL ASSESSMENT

Overview of the Unit

In this unit candidates are assessed on their practical skills including, forming hypotheses, recognising and preventing hazards and risks, recording and presenting data, understanding the variables that are involved in experiments, evaluating the success of the experiment and planning improvements. There was evidence that candidates are familiar with practical work and the analysis of practical results, although in some areas candidates' skills were not as well-developed as in previous series, this was particularly evident in graph plotting.

The nature of experimental work means that, on occasions, centres may feel the need to provide candidates with unformatted results to us in section B for graph plotting. This happens in a small number of cases each year. This year it was notable that many centres who gave their candidates results did not explain that they had done so and did not include a copy with the scripts. It is imperative that in such circumstances centres provide a copy of the original results to ensure that markers can accurately evaluate and award credit for correct data plotting.

The tasks all proved to be accessible for most candidates who usually attempted all sections. As in previous series, candidates were largely successful in making hypotheses and in identifying variables. Notable areas that candidates found challenging were scaling graphs and plotting points with accuracy. Lines of best fit were often very poor.

Comments on individual questions/sections

Section A – Hypotheses and risk assessments

Most candidates were able to make a sensible hypothesis in each of the 9 tasks, which linked the independent and dependent variables. The exception to this was in the investigating the effect of glucose concentration task where many candidates failed to link the independent and dependent variables and instead just predicted that a colour change would occur. In producing risk assessments, the most successful candidates linked the risk with a particular action in the method, such as burning your hand if you touch a hot beaker and were able to suggest a sensible control measure for that risk. Less successful candidates often did not link the risk to an action, for example, stating simply that apparatus can burn you with no reference to either the action of touching or the affected body part. It was also very common for candidates to create a risk for experiments when there were no significant risks such as in the impact craters task.

Section A - Tables of results

Most candidates produced well-structured tables with all the data recorded. Whilst most candidates only include units in the table headings it was more common than in previous series to see units in the body of the table. The unit for hydrogen peroxide concentration (vol) did cause issues in one task. In the glucose task many candidates confused the heading, concentration, with the unit, percentage. Incorrect abbreviations of units (e.g. secs for s / seconds) was commonly seen. Candidates should be reminded that they should always calculate a mean from their repeats as they will not be prompted to do this. The conversion of time from minutes to seconds in the glucose task posed issues for a significant minority of candidates which then led to errors in graph plotting.

Section B – Variables

Each of the 9 tasks included a section on variables. Candidates were usually able to identify the independent and dependent variables, and most were able to state the range of these variables when required. Many of the tasks explored how certain variables were controlled, and in common with previous series this was not well answered, with no clear indication of the apparatus used or the required measurement of that variable. For example, in the glucose task candidates needed to identify that the volume of Benedict's solution was measured to be 2 cm³ with a pipette. In the impact craters task candidates were asked to explain why an identified controlled variable was controlled. This was poorly answered with many responses referring to making it fair, rather than focussing on the effect that this would have on the diameter of the impact crater.

Section B – Graphs

The most successful candidates obtained most of the available marks in this section. However, a significant number of candidates displayed very weak graph plotting skills, more so than in previous series.

Even where suitable scales were chosen, many candidates struggled with the accuracy of their plotting. Scales were also often poor with multiples of 3 commonly seen, these are not accepted. In tasks where the data range was narrow, candidates often did not truncate and this made plotting the data difficult and the drawing of a suitable line of best fit. Whilst candidates were not penalised for not truncating scales, there were numerous candidates who incorrectly truncated by not starting the scale with a suitable number and either omitted a zero on the y-axis or did not indicate truncation had taken place.

Lines of best fit continued to be problematic as many candidates simply joined the first and last point with no consideration of the spread of data above and below the line. Joining point-to-point is only usually acceptable in Biology tasks but this was seen commonly in all tasks.

In all tasks candidates are often asked to identify the relationship between the plotted variables and this was usually done well. Whilst most candidates were able to describe a relationship between the independent and dependent variables in the graph, a description of the shape of the graph, where it was required for the second mark, was poor.

Section B – Evaluation of results

In many of the tasks, candidates were asked to evaluate accuracy, validity of the experiment, closeness to the true value, repeatability and / or reproducibility of their results of given data. Whilst it is evident that the terminology is familiar and broadly understood, the clarity of candidates' responses often limited the marks attained. When considering repeatability candidates should make clear reference to the closeness of repeat readings; it was common to see vague responses referring to all the results being close which gained no credit. Of the candidates correctly referring to repeats, few went on to use the data to support their judgment.

When evaluating the reproducibility of given data in the glucose experiment, many candidates were able to recognise that the reproducibility was poor because the results were different between groups. Very few recognised that all groups had the same pattern in their results.

Section B - Improvements

Identifying inaccuracies and corresponding improvements was poorly done by many this year. Candidates should be encouraged to consider what they found difficult in carrying out an experiment and base their responses around this. In the glucose task, many suggested that the timing was inaccurate and considering using a stopwatch with a better resolution as an improvement, rather than describing how difficult it was to judge when the endpoint had been reached. Similarly, in the craters task many discussed the levelness of the sand which gained no credit.

Section B – Plans

Where tasks included a plan at the end, these were generally better answered than in previous years. In the electrolysis task most candidates attained marks for stating that the current would be measured and describing how the solution would be heated. In common with other plans, candidates did not always state at least 4 values of the independent variable or list at least two controlled variables.

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