T-LEVELS | IfATE Institute for Apprenticeships and Technical Education

Chief Examiner Report

T Level Technical Qualification in Science
QN: 603/6989/9

Summer 2025– Core Paper A and Core Paper B

NCFE CACHE

Introduction

Summer 2025 – Core Paper A and Core Paper B

Assessment dates: Core Paper A 16 June 2025
Core Paper B 20 June 2025

Paper numbers: Core Paper A P0020810 (paper-based) and P002812 (onscreen)
Core Paper B P002811 (paper-based) and P002813 (onscreen)

This report contains information in relation to the externally assessed component provided by the chief examiner, with an emphasis on the standard of student work within this assessment.

The report is written for providers, with the aim of highlighting how students have performed generally, as well as any areas where further development or guidance may be required to support preparation for future opportunities.

Key points:

- grade boundaries
- standard of student work
- responses to the external assessment questions
- administering the external assessment

It is important to note that students should not sit the core exams until they have received the relevant teaching of the qualification in relation to this component, and that both papers must be taken in any given series that a student sits the core exams.

Grade boundaries

Raw mark grade boundaries for the series are:

	Overall	Notional boundaries	
		Paper A	Paper B
Max	231	112	119
A*	191	92	99
A	167	80	87
B	143	68	74
C	119	56	61
D	95	45	49
E	71	34	37

Grade boundaries are the lowest mark with which a grade is achieved.

Students receive a grade for the core exam component as a whole, and although there are no official grades for the individual assessments in the core exam, it can be useful for students and teachers to see how the core exam grade was achieved. The grade boundaries given for each assessment are known as ‘notional grade boundaries’, as they are for illustrative purposes only. For further information on

notional grade boundaries, please see our guide T Levels: Notional boundaries for the Core Exam assessments (Paper 1 and Paper 2) available on the qualification page on the NCFE website.

For further detail on how raw marks are converted to uniform mark scale (UMS), and the aggregation of the core component, please refer to the Qualification Specification.

Administering the external assessment

The external assessment is invigilated and must be conducted in line with our Regulations for the Conduct of External Assessment document.
3
Students must be given the resources to complete the assessment, and these are highlighted within the Qualification Specific Instructions for Delivery (QSID) document.

Standard of student work

Across both papers there was the broadly expected range of student achievement, with improvements in some particular areas compared to previous series. More students are attempting more of the questions, leading to fewer blank responses and improved evidence being provided of students' learning. Where there were gaps in papers these were often towards the end of the paper, suggesting that some students may have run out of time and could benefit from improved coaching and practice with exam technique. In some instances, especially where students have completed the exam online, responses to the extended-response questions (ERQ) were very short, sometimes only amounting to one or two sentences, which extremely limits students' scope for demonstrating the depth and breadth of their knowledge and understanding and therefore limits the number of marks which can be awarded in these questions.

It is also worth noting that examiners noted a marked deterioration in the quality of handwriting in some cases, compared to previous series. Examiners will always try to decipher the answers students are providing, however there were some cases this series where handwriting was so poor that students have potentially missed marks because their responses could not be read. Providers could support students in ensuring their responses are legible and clear, perhaps by encouraging them not to rush their writing when completing the exam paper. Again, coaching with exam technique and practice using past and mock papers would be beneficial here.

Responses to the external assessment questions

Core Paper A

Section A: working within the science sector

Questions 1 and 2: within this section required basic recall of knowledge and were reasonably well answered by students across the ability range.
Question 2: students gave a very wide range of non-science sectors which require the application of science, indicating a breadth of understanding and consideration of this. Where marks were lost here this was sometimes because students only gave one sector, or where they gave an example of a science sector (such as food science).
Question 3: students were asked to define the different levels of technical occupations. Where marks were lost this was because students had either confused the levels of education typically associated with each type of occupation, or gave very superficial responses which did not give the required level of detail to be able to be awarded the mark.
Question 4: was the first in this paper which required students to apply their knowledge and understanding to the context provided. Many students answered this question well, however where

marks were lost this was often because only one reason was explained, or the same reason was explained twice, which could not be awarded full marks. Some students' responses were only repeating information from the stem of the question, which could not be awarded marks, for instance by saying why it was important to make sure the refrigerator was correctly calibrated.
Question 5: required students to consider the impact of the decision made by the laboratory's business manager. A range of different approaches were considered here and many students gained one mark for a simplistic comment about the importance of data analysis, however relatively few were able to develop their answer sufficiently to achieve the further marks here.
Question 6: was the extended-response question (ERQ) in this section. This provided students with an opportunity to demonstrate their knowledge and understanding of a range of types of policy and procedure which are relevant to the science sector, and the range of responses was, as expected, highly variable. Some students are still answering these questions with very brief responses, not including much, if any, content which can be credited for assessment objectives AO2 or AO3, which significantly limits the banding of marks which can be awarded here. Providers could support students in answering these questions by coaching them to structure their answers round a what / why / however format to try and ensure they cover each of the AOs covered here. The quality of written communication (QWC) is also assessed in these questions, and across this paper QWC was very variable. Many students lost marks for QWC due to poor structuring of responses such as lacking punctuation or paragraphs, and inconsistently accurate use of technical language.

Section B: ethics, data and managing personal information in the science sector

Question 7 (a): a large majority of students were able to demonstrate their understanding of managing a data breach. Question 8 however provided more of a challenge, with many students unable to recall the stages of data handling and processing.
Question 9: also provided a challenge for some students, who were unable to fully explain the benefits of using a software system in a laboratory. Many lost marks by only explaining one benefit, whilst others attempted to explain two benefits, however gave very limited and superficial responses, making it difficult for them to gain higher marks here.
Question 10 (a): many students were unable to make the distinction between copyright and a trademark. The statement made by the scientist in the question is incorrect, however many students answered this question by simply agreeing with the statement, whereas relatively few students correctly identified that copyright cannot be used to protect a brand name and that a trademark would be the correct way to safeguard this type of intellectual property.
Question 10 (b): was answered much more consistently well answered, with many students able to assess one of the suggestions provided in the question.
Question 11: was the extended-response question (ERQ) in this section. This was the ERQ which students performed best on across the whole paper. Many students were able to give a reasonable attempt at evaluating the proposals given in the question. Where marks were lost these were for similar reasons given previously in question 6; brevity of response and lack of application and evaluation detail limiting which marking bands would be available for the responses.

Section C: health and safety in the science sector

Question 12: was reasonably well answered, as expected, with many students being able to correctly identify the purpose of the Management of Health and Safety at Work Regulations 1999
Question 13: many students correctly described the importance of the Environmental Protection Act 1990 with regards to regulation of waste management. Very few, however, identified the other key area covered by this act – the use and containment of genetically modified organisms – suggesting that whilst students' knowledge in this area was adequate for a one-mark recall question, additional depth of learning would be beneficial.

Question 14: many students struggled with both parts of this question. The main issues here were with students rephrasing and repeating the information contained within the question, which cannot be credited, or with students conflating the two different parts of the question – answering part (i) in terms of protecting the external environment and answering part (ii) in terms of protecting people inside the laboratory.
Question 15: provided a reasonable level of challenge for students, with a wide range of levels of response being demonstrated. Many students recognised that the mobile phone in the laboratory could interfere with the equipment and lead to inaccurate readings. Relatively few, however, recognised that the radioactive environment could damage the phone which would lead to distress for the employee and expense in replacing the phone. Many students incorrectly suggested that the levels of radioactivity released by the phone would contaminate the experiment to dangerous levels, seemingly forgetting that mobile phones are in very common use around the general population, including in food handling areas.
Question 16: students were generally able to make a basic assessment of the statement given, however marks were missed where students did not develop these answers to the extent necessary to provide a full response to the question asked. Pleasingly, a relatively small number of students attempted to counter-argue the point by saying that minor accidents may not need to be reported, suggesting a good level of basic understanding of this area.
Question 17: this question provided students with a wide range of information about an incident at a laboratory and asked them to evaluate a preliminary investigation report. In a similar manner to the other extended-response questions (ERQs) in the paper students were able to give a reasonable attempt at evaluating the findings in the report however marks were missed where answers were overly brief, lacking in detail, and did not give examiners enough structure to be able to award in the higher marking bands.

Section D: scientific methodology, equipment and techniques

Question 18: asked students to identify the correct definition of a positive control, and was answered well by some students. A significant minority, however, were unable to answer this correctly and instead chose option D, which is the definition of a negative control, suggesting a lack of detailed knowledge in this area. Providers could support students by ensuring students fully understand the definitions of these key terms.
Question 19: students were generally able to give a brief overview of the reasons for holding a planning meeting before commencing a new laboratory project. Further marks were often missed because students did not go on to develop answers fully into detailed explanations.
Question 20: students were able to make a basic statement about why calibration would be important but could not extend this into a more detailed explanation.
Question 21: this question was fairly well answered, with most students being able to explain that the use of sensitive equipment requires training to avoid inaccurate readings being made and the potential consequences of this not being in place. Where marks were lost this was where students gave very shallow responses and did not fully apply their answer to the context given in the question.
Questions 22 and 23: across the paper these questions were the ones with the most blank responses. This was possibly due to students running out of time, as other responses were of a comparable level to similar style questions in the paper. As with other questions assessing AO3, responses here were mixed with some students providing good responses which achieved high marks and others lacking in detail with very little development of the answer to give access to the higher level marks for application and evaluation of the information provided. In question 23 students frequently missed the point that broad internet searches are likely to produce results which are less relevant, biased, and unreliable, in contrast to the use of research databases which can be accurately filtered to find relevant, peer-reviewed literature which would lead to more reliable research outcomes.

Core Paper B

Section A: biology

Questions 1 and 2: The first two questions in this section required basic recall of knowledge, and were answered broadly in line with expectations with many students scoring well on both these questions.
Question 3 (a): provided opportunities for students to demonstrate their knowledge and understanding of the function of cell organelles. Again, these were generally answered in line with expectations; where students missed these marks they generally gave incorrect statements of the functions of the organelles, demonstrating some missing fundamental knowledge and understanding.
Question 3 (b): was the first calculation question on the paper and was generally answered well. Some students rearranged the provided equation incorrectly, whilst others miscalculated the conversions from mm to µm producing an answer which was therefore incorrect. Where possible, error carried forward was awarded however some responses were very jumbled and it became difficult to identify opportunities to award these marks.
In question 4 (a): students were generally able to provide an example of passive transport. Where marks were missed this was often because students stated ‘active transport’, which is incorrect.
Question 4 (b): asked students to explain the reasons for large numbers of mitochondria in the lining of the small intestine, and was reasonably well attempted by most students. Many correctly identified that energy was required for transporting glucose into the bloodstream, however fewer mentioned ATP as the mechanism of transferring that energy from respiration to be used in active transport.
Question 5: required students to identify carbon, hydrogen, and oxygen as the components of monosaccharides. Many students incorrectly tried to name three monosaccharides, suggesting an issue with exam technique rather than with fundamental knowledge and understanding.
In question 6 (a): students were asked about triglycerides. Part (i) required them to identify the types of molecule which make up a triglyceride, and many students scored both marks here. Where marks were lost this was generally because this question was unanswered, suggesting a gap in fundamental knowledge. In part (ii) this was extended to ask students to describe the formation of a triglyceride. Fewer were successful here, with many blank responses suggesting some gaps in knowledge of this aspect of the specification. Some students attempted to answer this in terms of condensation or hydrolysis reactions, however these did not include sufficient detail to be creditworthy.
Question 6 (b): asked students to explain the advantages of lipid storage for hibernating bears. Many students answered this well, providing detailed responses covering both the thermal insulation and energy storage aspects of this. A small number of students appeared to misunderstand this concept, providing responses referring to the bears eating the lipids during hibernation, demonstrating a fundamental misconception about this topic.
Question 6: Many students struggled with this question (c), with lots of these being blank responses. Where a response was attempted, marks were missed by students providing very brief, superficial responses which did not provide any creditworthy material, or simply repeated the wording in the question.
Question 7 (a): parts (i) and (ii) were largely well answered. Where students missed marks in part (i) this was generally because they misremembered the name of tRNA, providing responses such as ‘transport RNA’. In part (ii) marks were missed where students gave the incorrect organelle, with ‘mitochondria’ being the most common incorrect response. Whilst energy from ATP is required for protein synthesis, ribosomes are the organelle responsible for this process.
Question 7 (b): students were asked to consider a hypothetical statement about the use of RNA compared to DNA in coding for proteins. Many students seemed to find this difficult, suggesting that because RNA contains uracil rather than thymine this would not be possible. Students should be aware that messenger RNA carries a complimentary copy of the DNA sequence during transcription, and therefore should have been able to assess the statement made and appreciate that RNA could act as a DNA coding molecule more broadly.
Question 8: asked students to assess a statement about the effect of enzyme concentration on the digestion of a protein. Many student struggled to give sufficient detail here to score full marks, instead

giving very simple statements such as the rate of reaction would increase. Some tried to answer in terms of other factors (for example temperature, pH) and the denaturation of the enzymes – whilst some of these were scientifically accurate, they were not relevant to the question asked and could not be credited.
Question 9: was the first extended-response question (ERQ) on this paper. The points made above are very much applicable to this question – where marks were missed this was largely because students gave only limited, recall-based responses lacking the application and evaluation detail needed for higher marks to be awarded. In this question specifically students generally appeared to understand the core principle behind the question, and there were some fairly good technical responses demonstrating their knowledge of mutations and the immune system.

Section B: chemistry

Question 10: was very well answered, with a large majority of students being able to correctly identify the salt produced in the neutralisation reaction described.
Question 11: students were generally able to provide an accurate example of a quality of acids.
Question 12 (a): most students were able to correctly explain how carbonates can neutralise excess stomach acid and reduce the symptoms associated with this. These three questions taken together suggest students have demonstrated a sound basic understanding of the properties of acids and bases.
Question 12 (b): students were asked to explain why phenolphthalein did not work in a titration between a strong acid and a weak base. Many students seemed to find this relatively difficult, suggesting a very limited level of understanding of the use of indicators in titrations. Most students gave very limited, disorganised responses with little creditable material.
Question 13 (a): The calculation in this question was largely well answered, with students correctly calculating the rate of reaction. Where errors were made this was often due to students unnecessarily subtracting the initial and final amount of product – where the calculation was laid out clearly some students were able to gain an error carried forward mark in this instance.
Question 13 (b): many students answered correctly. Where marks were missed this was often because responses were not fully developed enough to explain why a larger surface area increases the rate of reaction. Other incorrect approaches included some students who mistakenly thought that smaller particles had a smaller surface area and therefore a smaller rate of reaction, or those whose answers attempted to explain this in terms of other factors such as temperature or concentration of reactants.
Question 13 (c): Students performed similarly in this question. Where marks were missed this was often because students did not recognise that to make a final conclusion, they would need to take into consideration the relative costs associated with the increase in temperature and use of the catalyst, as well as the added value gained from increasing the rate of reaction. Without this, students tried to make conclusions based on arbitrary assumptions and consequently found it difficult to fully argue these, leading to incomplete and disorganised responses.
Question 14: was largely well answered, with most students recognising that elements with a larger number of electron shells will be more reactive, and many of these gave good explanations beyond this in terms of the force of attraction between the outer electron and the nucleus, or in terms of electron shielding.
In Queston 15: most students were able to assess the different properties of carbon fibre and the suitability for the use by an athlete. A small number made errors by giving incorrect properties of carbon fibre or by contradicting themselves, such as saying carbon fibre is both hard and soft, or cheap and expensive, limiting the scope of marks which could be awarded.
Question 16: was the extended-response question (ERQ) asking about Thin Layer Chromatography (TLC). Students generally struggled with this, with a number of fundamental misconceptions being demonstrated. Many students were unable to express any understanding of the principle of TLC in terms of affinity for the mobile phase or stationary phase. Some students went on to suggest that the quantification of the components of the mixture based on the darkenss of the spots was much more precise than could realistically be assumed. Additionally very few students went on to discuss other separation techniques such as gas chromatography and mass spectrometry which could be used to quantify the components in the mixture. As described earlier, many students ultimately gave very brief,

superficial responses to this question which limits the level of marks which can be awarded on these questions.

Section C: physics

Question 17: was answered well by many candidates, underscoring a fundamental strength of knowledge and understanding of the features of a wave. This is reinforced when considering questions 20 (b) and 20 (c) which also draw on students' knowledge of properties of waves.
Question 18: both part (a) and (b), provided an unexpected challenge for many students. In question 18 (a) many students gave answers which were very vague and did not cover the points required for the marks. Some understood part of the definition with regards to constant velocity but tried to express this over time rather than across the moving body of fluid.
Question 18 (b): many tried to answer this question in terms of the thickness of a fluid or the density, rather than providing a definition of these terms.
Question 19: students performed broadly as expected. Many students were able to give relatively simple responses, correctly identifying that at lower temperatures particles move with less energy, colliding with each other and the cylinders with less energy, leading to lower pressure. Fewer students, however, were able to extend their answers to fully assess the statement made and achieve full marks here, failing to consider the full picture and provide the balanced discussion with regards to possible advantages and disadvantages of this strategy and therefore higher marks could not be awarded.
Question 20 (a): asked students to recall a reason for the use of scientific notation and appropriate significant figures, which provided more of a challenge than expected. Where marks were not awarded this was because responses were very vague, for example discussing 'easier' handling of data, making it very difficult to credit these responses.
Questions 20 (b) and 20 (c): were generally well answered, as with question 17; students seem to have a sound understanding of wave properties and behaviour. In the calculation in question 20 (b) some students made simple mathematical errors and were awarded error carried forward where possible.
Question 21: students were asked to evaluate a suggestion made about exposure to X-rays and radioactive tracers. Students answered this question broadly in line with expectations, with many understanding the fundamental risks of repeated exposure to ionising radiation, however fewer were able to expand these answers to apply them to the context of the question and develop a reasoned, balanced evaluation.

Section D: scientific concepts

Question 22: asked students to describe evidence from a HPLC trace. Many students were able to recognise that the abundance shown on the graph correlates to the concentration of the compound in the sample, however fewer were able to link the retention time to the affinity for the mobile phase – instead many students described this in terms of time taken for a reaction to take place or similar, which could not be credited.
In question 23 (a): many students were correctly able to identify anaphase as the stage of mitosis, however some did not provide any explanation for their choice. Others mistook this stage for another, most commonly metaphase where chromatids line up along the equator of the cell prior to division.
Question 23 (b): many students went on to give very good explanations of the importance of meiosis and mitosis, clearly demonstrating their understanding of the mechanism and purpose of different types of cell division.
Question 24: students were asked to consider the importance of selecting a radioactive source with an appropriate half-life for diagnostic use. Some students provided strong responses here, covering both the requirement for the half-life to be long enough to remain in the body and sufficiently radioactive to be useful, whilst balancing this with the need for the radiation to decay quickly enough to minimise the patient's unnecessary exposure to ionising radiation.

Queston 25: asked students to assess a suggestion made with reference to the behaviour of compressed gas cylinders in a fire. Some students were correctly able to analyse the details of Boyle's law and the behaviour of gases, however most failed to recognise that Boyle's law does not directly relate to temperature (unlike Charles' law) and therefore were unable to score more highly in their responses. A number of students instead structured their answer around more general fire safety issues and generally missed marks here.
Question 26: asked students to evaluate a claim about providing sanitation for a low-income country to help reduce the spread of a bacterial disease. As with other extended-response questions (ERQs) there were a range of responses including some demonstrating a good level of understanding and evaluative skills. Most however, were fairly superficial, and gave little application or evaluation to enable access to the higher mark bands. Very few students gave responses demonstrating deeper understanding of the key features of disease transmission and the potential impact of hygiene measures.

Document information

The T Level Technical Qualification is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.

NCFE is authorised by the Institute for Apprenticeships and Technical Education to develop and deliver this Technical Qualification.