HM Government

T-LEVELS

Chief Examiner Report

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

Autumn 2025 – Core Paper A and Core Paper B

NCFE CACHE

Introduction

Autumn 2025 – Core Paper A and Core Paper B

Assessment dates: Core Paper A 08 December 2025
Core Paper B 12 December 2025

Paper numbers: Core Paper A P003005 (paper-based) and P003007 (onscreen)
Core Paper B P003006 (paper-based) and P003008 (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 examinations 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 examinations.

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 tutors 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.

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

Student performance was generally in line with expectations, with a clear range of achievement visible across both papers. Students typically performed well in assessment objective (AO) 1 (recall / knowledge) questions but found higher-order skills, such as AO2 (application) and AO3 (evaluation), more challenging.

Key strengths demonstrated across both papers included fundamental knowledge: core concepts in biology (cell parts), chemistry (rate of reaction), and physics (wave types) were well handled. Most students successfully performed calculations and utilised provided equations, showing competence in basic mathematical skills. Students were also demonstrating a strong grasp of scientific ethical standards.

Common pitfalls across the paper include extensive examples of students losing marks by simply rephrasing the question rather than providing new information. There was also often a lack of depth in ‘explain’ questions, where students frequently identified a factor but failed to provide the necessary ‘how’ or ‘why’ to secure full marks.

In evaluative questions, many students sat on the fence or attempted to provide two-sided arguments without reaching a firm, reasoned conclusion.

Performance was consistent across extended-response questions (ERQs), but marks were often limited to the lower and middle bands due to a lack of evaluative reasoning and application to the specific scenario. There is also evidence that students struggled with time towards the end of the papers, particularly on the final ERQ. Misinterpretation was common in questions requiring graph analysis or specific procedural steps (for example, confusing ‘escalation’ with ‘recalibration’).

Subject-specific challenges

- Scientific methodology – there continues to be persistent gaps in knowledge regarding Newtonian / non-Newtonian fluids and positive and negative controls.
- Biology misconceptions – surprisingly, fundamental concepts like aerobic respiration and the definition of differentiation (versus specialisation) caused confusion.
- Chemistry specifics – students struggled to link gas chromatography to the requirement of the sample being in a gas phase.

To improve future performance, providers could focus on the following pedagogical reminders:

- Command verbs – explicitly teach the difference between ‘identify’, ‘explain’ and ‘assess’, and their connection to the relevant AOs. Students must move beyond identification to explanation to access higher marks.
- Avoid redundancy – remind students that repeating the question stem or provided scenario data without adding analysis does not earn credit.
- Commit to a conclusion – for ‘evaluate’ or ‘assess’ questions, students should be coached to make a clear judgement supported by evidence, rather than just listing pros and cons.
- Technical accuracy – emphasise precise definitions for frequently confused terms (for example, active versus passive transport, or Newtonian versus non-Newtonian fluids).
- Maths conversions – ensure students practise unit conversions (for example, cm to µm) rather than assuming a standard 1000x multiplier.

Responses to the external assessment questions

Core Paper A

Section A: working within the science sector

In this section the assessment objective (AO) 1 questions were generally well answered, with students demonstrating their knowledge of key concepts and understanding of core principles in line with expectations.

Questions 2: marks were lost in this question due to students misinterpreting it and answering in terms of how they would recalibrate the equipment, rather than escalation of the concerns, as required in the question.

Question 3: it was pleasing that the majority of students were aware of the benefits of degree apprenticeships, although some responded in fairly basic terms, including repeating parts of the question stem, which could not be credited.

Question 4: this question, along with questions 10, 11 and 23, was often answered in a similar style, suggesting a pattern in responses to questions using the command word 'explain'. Where students were asked to explain a single example, responses frequently lacked the detailed explanation required for full marks, with basic statements being made and the question stem being repeated. In several cases across these questions, students provided two examples rather than fully explaining one as required, meaning full marks could not be awarded.

Question 5: students were asked to assess a statement made about good manufacturing practice. Stronger students scored highly here, and where marks were lost, this was usually because answers lacked depth. For example, many students gave some good examples of reasons the manufacturer needs to maintain the quality of the products, scoring some marks. However, they often did not then go on to say why that was important, the consequences of not doing this, and how their answers related to the statement in the question.

Question 6: this is the first extended-response question (ERQ) in this paper and students generally scored in line with expectations here. Marks were often lost where answers lacked detail, repeated information from the question, and did not apply the scenario or provide the evaluative reasoning required for higher mark bands. Overall, it was clear that many students have a good understanding of the importance of innovation in the science industry, but as these responses were often lacking in the skills required for AO2 and AO3, the marks awarded were limited.

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

Question 7: this question was well answered, with many students being able to identify a key aim of ethical practices outlined in ‘Rigour, respect, responsibility: a universal ethical code for scientists 2007’.

Question 8: many students were unable to recall a method scientists might use to order numbers by their relative size in a data set, with very few students scoring a mark on this question. This was a straightforward specification content recall question, suggesting a gap in students’ knowledge in this area.

Question 9: many students struggled to explain two ways in which data protection could be supported by policies. Where marks were low, this was sometimes because only one approach was explained, but more often because, although two reasons were identified, they were not explained, limiting the marks that could be awarded.

Question 10: this question was more successfully attempted by many students, with a range of creditworthy answers being provided that outlined the legal consequences for the scientist and the organisation.

Question 11: students provided some strong answers to question 11 and were able to give explanations for a wide range of consequences of omitting anomalous data. Where marks were lost, this was due to basic responses not being developed sufficiently to be able to be credited.

Question 12: students were asked to assess a proposal for a new laboratory software package. Marks were missed because answers lacked the level of depth needed to fulfil the 'assess' requirement of the question, with responses being superficial or lacking in a thorough evaluative analysis of the proposals in the question. As with other examples, many responses were simply repeating the phrasing from the question, which could not be credited.

Question 13: this was the extended-response question (ERQ) in this section, and students performed broadly similarly to question 6. Many students were able to accurately identify additional benefits and risks of the use of digital laboratory systems, but marks were lost where these ideas were insufficiently developed, as students did not apply their knowledge to the context of the question or proceed to make an informed, evaluative judgement.

Section C: health and safety in the science sector

Questions 14 and 15: these first two recall questions were answered broadly in line with expectations, with many students demonstrating their learning and knowledge in these areas.

Question 16: this question was very poorly answered, with many students demonstrating a significant gap in their knowledge of Control of Electromagnetic Fields at Work Regulations 2016.

Question 17: similarly to question 9, provided responses either only covered one aspect or gave two aspects but failed to explain either of them in any detail; therefore, limiting the marks available. In many cases, only partial marks were awarded due to answers simply repeating the question stem

Questions 18 and 19: these questions were answered reasonably well and in line with expectations. Many students were able to explain changes to health and safety processes and showed a good level of knowledge and understanding of working with dangerous biohazards.

Question 20: this was the extended-response question (ERQ) in this section and was somewhat less successful than the ERQs in the previous sections. The issues students seemed to encounter here were generally related to them trying to give answers which sit on the fence rather than making a clear,

reasoned conclusion. Where students scored higher marks, some argued in favour of the statement in the question and others argued against; however, the higher mark bands become easier to award where a clear conclusion was made and arguments were reasoned to support this.

Section D: scientific methodology, equipment and techniques

Questions 21 and 22: students answered these questions well, recalling the necessary information for these questions.

Question 23: students were asked to explain the use of a positive control in an investigation, and this proved more challenging than anticipated. Many students seemed unable to do much more than repeat the wording of the question, whilst others simply misremembered the details of a positive control, giving answers such as ‘to make sure the answer is the correct one’. This specification point has been examined in previous series, so it is disappointing that this has still not been well embedded in students’ learning.

Question 24: this question was the AO3 'discuss' question, worth four marks, and students' responses were broadly in line with expectations. Some higher-scoring responses gave accurate discussion points both in favour of and against the suggestion, correctly identifying the benefits and drawbacks of applying for ISO accreditation.

Question 25: this question was an AO2 'explain' question, and it proved more challenging than anticipated. Students were required to explain two planning methodologies, and the main issue observed was the lack of detail provided in responses; often two methodologies were named, but no real attempt to explain them was made. There were also more blank responses than expected for this question, suggesting there may be a gap in students’ knowledge of critical path analysis and risk management.

Question 26: this was the final question on the paper and the extended-response question (ERQ) for section D. This question was answered somewhat less well than the other ERQs, possibly as a result of students running out of time at the end of the paper. Providers could support students here by coaching them to manage their time during the exam. Additionally, as with other ERQs in this paper, where students were unable to be awarded the higher mark bands, this was often because they tried to argue that the methodology and analysis was both good and bad, leading to incomplete arguments and a lack of reasoned justification for their arguments and conclusions.

Core Paper B

Section A: biology

The multiple-choice questions at the start of this paper were generally answered well and provided an expected level of challenge and response.

Question 3: this question showed that surprisingly few students were able to give a reasonable description of aerobic respiration. Many answers were simply nonsensical, and many others were unable to be awarded full marks, as they were incorrectly describing respiration as being ‘produced’. Responses to this question were particularly disappointing, as this is a fundamental concept in biology which is taught and examined at GCSE level.

Question 4: this question was generally well answered. Some examples of incorrect answers given included endo- / exothermic and very basic responses, such as ‘chemical reactions’, but it was clear that many students have good levels of knowledge and understanding of these concepts.

Question 5: students were asked to identify two parts of a labelled bacterial cell, and many were successful in identifying the flagellum and the plasmid. Some students were awarded marks for credible

alternative responses, such as ribosomes; however, where marks were lost, this was often because organelles were named which are not found in prokaryotes, such as mitochondria.

Question 6: this question was answered broadly in line with expectations, with many students identifying that waste would build up or leak from the broken pipe. Some students were unable to be awarded some marks as they provided responses which repeated the question rather than providing any new information.

Question 7 (a): this question was the first test of mathematical skills in this paper, and students' responses were largely in line with expectations. Many students performed very well and scored full marks. Where this was not the case, it was often because the rearranging of the equation was not completed correctly. Other common mistakes here included incorrect conversion between centimetres and micrometres, as required in the question. Students need to be careful to use the correct conversion factors, rather than assuming these will always be multiples of x1000.

Question 7 (b): many students provided a good response, as expected.

Question 8: many students were able to accurately identify three components of ribonucleic acid (RNA).

Question 9: this question proved more challenging than expected, with a number of students failing to provide an adequate explanation to achieve both marks available. It was clear that the vast majority of students had some level of understanding of the principles of mutation of DNA; however, they were often unable to develop an explanation to a level suitable for being awarded full marks.

Question 10 (a): many students were able to identify cellular transport processes. Some students only gave one response, despite the question asking for two, and other students who were unable to be awarded marks were those who stated 'active transport', as this was the example provided in the question.

Question 10 (b): students were asked to interpret some data relating to active and passive transport. Students broadly answered this as expected, with many being able to interpret at least some of the data correctly. Higher-achieving students were able to assess the data and understand that the transport must be at least partially active, as the rate decreases when the inhibitor is present, but then some exchange continues so some other transport could be taking place. Some students also suggested that there could just be active transport taking place, and maybe after the inhibitor is introduced there is some residual adenosine triphosphate (ATP) present so a lower rate of transport can take place. This rationale is feasible, and so marks were awarded for these responses.

Question 11 (a): many students were correctly able to identify differentiation as the process which drives specialisation. Some students stated 'specialisation' as their answer, which could not be awarded marks, as this was the term given in the question.

Question 11 (b): this question was very well answered, with most students giving an accurate example of a specialised cell. Where marks were lost, this was often because students thought that stem cells are differentiated.

Question 12: this question performed broadly in line with expectations, with many students scoring some marks here. Some found this challenging, but again this was largely because they shied away from making a firm conclusion. Those who gave more flowing, higher-scoring responses were those who made a decision and then used the evidence provided in the question to justify these. Some students were able to score highly by giving arguments for and against the suggestion, and these were largely successful because the responses were well organised and structured accurately.

Question 13: this is the extended-response question (ERQ) in this section. This performed largely in line with expectations, with many students achieving marks in the middle and lower bands of the marking grids, and stronger students being awarded marks in the higher bands. Students who scored lower marks were those who seemed to struggle to apply the knowledge to the context in the question and who didn't give a firm conclusion with supporting reasoning.

Section B: chemistry

Question 14: this question was answered well by the majority of students.

Question 15: this question performed as expected, with many students being able to name a quantitate method of separating components from a mixture.

Question 16: this question was also well answered, with most students being able to correctly complete the calculation. Where marks were lost, this was due to transposing the position of the values in the calculation, effectively calculating time / amount of product.

Question 17 (a): students were asked to justify the use of thin layer chromatograph (TLC), and many students gave some good, creditworthy responses, demonstrating a sound level of knowledge and understanding of this technique.

Question 17 (b): this question proved more of a challenge, with with relatively few students recognising the link between gas chromatography and the need for the sample to be a gas. A small number of responses referenced the fact that some compounds may break down upon heating, making them unsuitable for vaporisation required for gas chromatography. Many responses provided vague answers about 'the gas phase', which largely suggested that students had a gap in their knowledge of this technique.

Question 18 (a): many students answered well, showing a good fundamental understanding of the effect of temperature on rate of reaction. Where marks were lost, this was often due to responses being too vague; for example, nonspecific statements about the rate of reaction 'changing' or being 'different' or 'affected', rather than being specific and saying the rate increases. Some students also approached this from a different perspective, answering in terms of potential inaccuracy of equipment calibration as temperature changes, which is accurate and was credited as another suitable response.

Question 18 (b): this question performed similarly, with many students correctly identifying the most appropriate indicator for use in the given context. Where marks were unable to be awarded, there were a number of responses which seemed very confused about the role of indicators in a titration, suggesting that the presence of the indicator would change the pH of the end point, making the result unreliable.

Question 19 (a): students provided some good explanations of the reasons for selecting specific metals for use in water pipes, with stronger students being able to expand their responses to explain this in the context of the question, gaining full marks.

Question 19 (b): this question was also related to rate of reaction, and students generally responded to this in line with expectations. A small number of students lost marks as they misunderstood the question, thinking instead they were being asked about pressure in a copper pipe, leading to some confused responses.

Question 20: this was the extended-response question (ERQ) in the chemistry section, and was generally well answered, with most students showing a reasonable level of knowledge and understanding of the properties of the different materials. Similarly to other ERQs, students who scored lower marks were those who seemed to struggle to apply their knowledge to the context of the question and did not give a firm conclusion with supporting reasoning.

Section C: physics

Question 21: students answered this question well.

Question 22: this question proved a challenge for many students who were unable to state the meaning of a Newtonian fluid, suggesting an ongoing gap in knowledge in this area, which has been examined previously. Many students lost marks here by confusing the definitions of non-Newtonian and Newtonian fluids.

Question 23: this question performed in line with expectations. Some students were unable to provide all three key features of mains electricity, but many managed to score at least some of the marks available here.

Question 24: this question was a calculation question, which, similarly to other calculation questions, was reasonably well answered. A relatively large number of students struggled with rearranging the equation, meaning their marks were limited to those available through 'error carried forward' consideration.

Question 25: this question also performed in line with expectations, with many students being able to correctly review the information provided about different types of wave. Where marks were unable to be awarded, this was generally because responses did not develop ideas in sufficient detail to fully analyse the suggestion in the question.

Question 26: students were asked to assess the validity of a suggestion about increasing the strength of an electromagnet, and it was generally well answered by a wide range of students. Where lower mark bands were achieved, this was generally due to the responses lacking in depth and detail, often repeating the stem of the question rather than providing students' own assessment of the information provided.

Section D: scientific concepts

Question 27: students struggled to achieve both marks for this question, seemingly connected to the difficulties they had with question 22 in the previous section where there was a gap in the knowledge of the properties of Newtonian / non-Newtonian fluids. Some tried to argue that the ketchup would get thicker when the bottle is squeezed, missing the key point that non-Newtonian fluids can become more or less viscous when pressure is applied, suggesting a limited level of knowledge and understanding in this area.

Question 28 (a): many students were able to score one mark for a basic response, but relatively few could thoroughly explain how ATPase deficiency might affect muscle strength. Where marks were lost, this was largely due to a lack of detail being provided.

Question 28 (b) (i) and (ii): many students accurately explained that 37 °C is approximately human body temperature and enzyme action would increase. Some students could not be awarded marks here, as they tried to answer in terms of enzymes being denatured and becoming inactive at this temperature, which is not the case for human ATPase in the context of the question. In part (ii) of this question, students were then asked to explain what happens when the temperature is increased to 100 °C. Here, students performed more in line with expectations, although surprisingly few were able to fully explain the effect of denaturation, giving relatively simplistic responses and therefore limiting their mark achievements in this question.

Question 28 (c): students were given a very typical graph comparing the rate of reaction to substrate concentration, and asked to assess the suggestion that continuing to increase substrate concentration

could cause the rate of reaction to further increase. It is clear from the graph that the reaction has reached the maximum rate and that no further increase would be possible by simply increasing the substrate concentration; however, some students tried to argue that this could happen. Some students misinterpreted the graph to suggest that the reaction had actually stopped when the curve levels off, which is incorrect, and then made it very difficult for them to reason what would happen at higher concentrations. Overall, this question demonstrated a gap in students' understanding of the effects of substrate concentration on the rate of reaction, as well as a lack of skill in interpreting graphs.

Question 29: this was an extended-response question (ERQ) requiring students to evaluate a statement about the use of specific radioisotopes. As with other ERQs, this question was answered in line with expectations, with many students able to demonstrate a good understanding of this topic. Where marks were limited to lower bands, this was because of a lack of evaluative detail and application to the context provided in the scenario.

Document information