

International Advanced Level

Subject: Biology

The need for Transferable Skills

Sources: Cognitive/Intrapersonal and Interpersonal skills adapted and taken from the NRC framework

In recent years, higher education institutions and employers have consistently highlighted the need for students to develop a range of transferable skills to enable them to respond with confidence to the demands of undergraduate study and the world of work. The Organisation for Economic Co-operation and Development (OECD) defines skills, or competencies, as 'the bundle of knowledge, attributes and capacities that can be learned and that enable individuals to successfully and consistently perform an activity or task and can be built upon and extended through learning'.

To support the design of our qualifications, the Pearson Research Team selected and evaluated seven global 21st-century skills frameworks. Following on from this process, the team identified the National Research Council's (NRC) framework as the most evidence-based and robust skills framework, and have used this as a basis for our adapted skills framework.

The framework includes cognitive, intrapersonal skills and interpersonal skills. These skills have been interpreted to ensure they are appropriate for this subject. All of the skills listed are evident or accessible in the teaching, learning and/or assessment of the qualification.

Identifying and highlighting these skills in International Advanced Level qualifications ensures that it is not only the academic and cognitive skills that are developed, but those broader elements that universities highlight as being essential for success. Skills such as self-directed study, independent research, self-awareness of own strengths and weaknesses and time-management are skills that students cannot learn from a textbook but have to be developed through the teaching and learning experience that can be provided through an international curriculum.

In the tables below, we have taken the NRC framework skills and provided definitions of how each skill can be interpreted for this subject. This will enable teachers and learners to understand examples of how they can develop each skill through an International Advanced Level qualification.

Intrapersonal skills		Interpersonal skills		Cognitive skills	
Intellectual Openness		Teamwork and collaboration		Cognitive Processes and Strategies	
Adaptability	Select and apply knowledge and understanding of scientific processes, which is not prompted or provided, to problems in biology.	Communication	Communicate a biological process or technique, either verbally or written, to peers and teachers and answer questions.	Critical thinking	Use many pieces of information from different areas of the subject and synthesise the information to make judgments.
Personal and social responsibility	Appreciate the ethical and social issues in biology.	Collaboration	Carry out a peer review and provide supportive, constructive feedback to another.	Problem solving	Apply unifying patterns and themes in biology and use them in new and changing situations.
Continuous Learning	Plan and reflect on own learning, setting goals, meeting and reviewing them regularly.	Teamwork	Work collaboratively with other students in practical work so that the contribution of every student is valued and effective.	Analysis	Analyse and interpret data, experimental methods and results, drawing conclusions which are consistent with evidence from experimental activities.
Intellectual interest and curiosity	Identify a problem under own initiative, plan a solution and carry this out.	Co-operation	Share own resources and learning techniques with other students.	Reasoning/argumentation	Evaluate evidence related to biology and then bring it together to form a conclusion.
Work ethic/conscientiousness		Interpersonal skills	Use verbal and written communication skills in a dialogue about a topic in biology.	Interpretation	Select, organise and present relevant information clearly and logically using appropriate vocabulary, definitions and conventions.
Initiative	Use knowledge of biology independently, without guided learning, to further own understanding.	Empathy/perspective taking	Support the position of another in a piece of writing or in an oral presentation.	Decision Making	Evaluate data, experimental methods and results, drawing conclusions that are consistent with evidence from secondary sources and other experimental activities. Suggest possible improvements and

Self-direction	Plan and carry out investigations independently.
Responsibility	Take responsibility for any errors or omissions in own work and create a plan to improve.
Perseverance	Seek new ways to continue and improve own learning, despite setbacks.
Productivity	Develop a fluency in technical vocabulary so that sophisticated answers are produced in extended answers.
Self-regulation (metacognition, forethought, reflection)	Appreciate own knowledge of biology and understand a learning task. Develop and refine a strategy over time for applications of biology to different contexts, reflect on the success or otherwise of the strategy.
Ethics	Produce output with a specific moral purpose for which one is accountable.
Integrity	Take ownership of own work and willingly respond to questions and challenges.
Positive Core Self Evaluation	
Self-monitoring/self-evaluation/self-reinforcement	Plan and review own work as a matter of routine.

Negotiation	Debate an ethical topic or issue in biology, attempting to reach shared conclusions with others, compromising where appropriate using negotiation skills.
Leadership	
Leadership	Lead others in a group activity to effectively encourage and develop learning.
Responsibility	Take responsibility for the outcome of a team activity, even if one is not solely responsible for the outcome.
Assertive communication	Chair a debate, allowing representations and directing the discussions to a conclusion.
Self-presentation	Utilise a number of different opportunities to exhibit communication skills in variety of ways including written and verbal, including presenting a topic to the class.

	further investigations to extend an investigation.
Adaptive learning	Understand unifying patterns and themes in biology and apply them in new and possibly unfamiliar contexts.
Executive function	Plan investigations using knowledge and understanding of experimental and investigative skills, with due regard for correct and safe laboratory procedures. Evaluate the effectiveness of an investigation in terms of accuracy, repeatability and validity.
Creativity	
Creativity	Apply existing knowledge and understanding of biological processes to situations set in a new and possibly unfamiliar context.
Innovation	Use a novel strategy to apply existing knowledge and understanding of biological concepts in new and unfamiliar situations.