

## International Advanced Level

### Subject: Physics

### 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	
<b>Intellectual Openness</b>		<b>Teamwork and collaboration</b>		<b>Cognitive Processes and Strategies</b>	
Adaptability	Reflecting on a method and the apparatus used when carrying out practical work and considering what improvements could be made.	Communication	Developing an ability to form an argument using verbal and written, linguistic and/or mathematical, expression.	Critical thinking	Using more than one area of Physics concepts to link ideas and synthesise knowledge when solving a problem.
Personal and social responsibility	Discussing areas of the specification e.g. big bang theory of the universe and how it is based on factual scientific evidence.	Collaboration	Sharing ideas when discussing approaches to class practical work.	Problem solving	Applying knowledge and understanding to familiar and unfamiliar contexts to produce a reasoned explanation or calculate a value.
Continuous Learning	Consolidating the AS topics within Physics as many of the A2 topics are related.	Teamwork	Working with others to develop an understanding of a key concept.	Analysis	Considering data from an experiment and using a graph to test for correlations or causal relationships.  Developing the ability to solve physics problems, including those of a mathematical nature.
Intellectual interest and curiosity	Undertaking a research project such as the extended project.	Co-operation	Listening, discussing and criticising respective answers/presentations from groups of students to a problem solving activity.	Reasoning/argumentation	Drawing a valid conclusion from a practical, using reasoned arguments.
<b>Work ethic/conscientiousness</b>		Interpersonal skills	Using verbal and non-verbal skills in presenting, or listening to, a reasoned argument.	Interpretation	Recognising that information can be presented in different forms.

Initiative	Showing a willingness to study and read beyond that routinely suggested by the teacher.
Self-direction	Planning and carrying out individual lines of enquiry.
Responsibility	Taking responsibility to manage one's own learning and creating a plan to improve.  Managing practical work safely.
Perseverance	Recognising areas of weakness and prioritising these as a way to improve.
Productivity	Developing a succinct written style to answer questions directly and fluently.
Self-regulation (metacognition, forethought, reflection)	Developing strategies over time, including self-assessment and critical review, for reflecting on the success or otherwise of the work.
Ethics	Engaging in discussions and arguing from an appropriate standpoint whilst being considerate to other views and positions.
Integrity	Employing working methods which are honest and appropriate.
<b>Positive Core Self Evaluation</b>	
Self-monitoring/self-evaluation/self-reinforcement	Developing the ability to reflect both positively and negatively about one's understanding of the concepts being covered.

Empathy/perspective taking	Being considerate of the position of others during class discussions.
Negotiation	Learning to agree to someone else's position or using the art of persuasion to reach a common understanding of a particular scenario or problem.
<b>Leadership</b>	
Leadership	Taking a leading role during discussions, shared problem solving sessions and practical work whilst ensuring other students are able to contribute appropriately.
Responsibility	Considering others when participating in class discussions.
Assertive communication	Learning to address conflicting viewpoints, using persuasive techniques effectively to convince a point of view which leads to a singular conclusion or answer.
Self-presentation	Developing a reflective attitude to one's behaviour during classroom discussions, shared problem solving sessions and practical work.

Decision Making	Selecting suitable apparatus and an appropriate method for an experiment.
Adaptive learning	Responding to a novel context and using knowledge and understanding to identify the key physics concepts under discussion.
Executive function	Working to appropriate time scales when planning and conducting practical work.
<b>Creativity</b>	
Creativity	Identifying possible sources of uncertainty when planning a practical. Explaining how these may be reduced or eliminated.
Innovation	Commenting on how an experiment may be improved, possibly by using additional apparatus.