

Context

The grading in science is holistic and non-hierarchical. For example, a student may have thorough knowledge and understanding of a complex concept for one topic area and they have fully understood an unfamiliar context presented to them in the exam. However, for a different topic area they may have no retention of the factual content or they may have the knowledge but cannot interpret or make the necessary connection to the context of a question. This means that whilst a student may perform very well in one particular assessment for one topic, they may not have the breadth of knowledge, skill in application or the long-term retention for the wide range of topics. Therefore, we will consider a range of data collected in different assessments that year.

Teacher Matrix

Grade	Knowledge, Understanding, Terminology and Application	Mathematical Skills	Data Analysis	Evaluation
Bronze	Is starting to link a word or experience to a scientific topic. Scientific terminology is absent and factual knowledge is lost over the short and long term.	Unable to perform addition and subtraction calculations without support.	Able to make a comment about the results of a completed practical	Able to put the steps of a simple experimental method in order.
Silver	Understanding of simple scientific concepts is challenging but present in one or two areas. Scientific terminology is currently absent and factual knowledge is lost over the long term.	Unable to carry out basic calculations without guidance.	Able to identify if there is an increase or decrease in a limited number of simply presented data but unable to relate to the variables in the investigation.	Students currently lack the understanding of scientific method to make comments beyond human error. An advantage or disadvantage is occasionally given in a simple and very familiar area of study.
Gold	Demonstrates some scientific knowledge and occasionally uses scientific terminology in a few simple topic areas. Long term retention is a significant challenge and is often absent. Application to contexts is absent.	Attempts at basic calculations in some areas occur however there are frequent errors.	Able to identify increases and decreases and occasionally identify a pattern if data is presented in simple and familiar formats.	Comments relating to experimental methods are limited and frequently limited to human error. Advantages and disadvantages are occasionally given but are limited very familiar areas of study.
1	Demonstrate some scientific knowledge and uses the scientific terminology for a few topic areas. Long term retention of topic content is a significant challenge and application to familiar contexts is rare.	Perform basic calculations in a limited number of areas, however errors occur.	Able to identify a simple pattern if data is presented in a simple format. A simple conclusion is given in some circumstances, but difficulty occurs with quantitative data or unfamiliar formats.	Occasionally make basic comments relating to experimental methods. Advantages and disadvantages given for a very limited number of situations where the topic is familiar.
2	Demonstrate some relevant scientific knowledge and understanding using limited scientific terminology for a narrow range of topic areas. Students experience difficulty in retaining knowledge over the long term and detail is often limited.	Perform basic calculations in some areas.	Able to identify and correctly describe a pattern using the correct variables for data provided in simple formats. Draw simple conclusions from qualitative or quantitative data.	Able to make basic comments relating to experimental methods. For required practicals the student can provide some evaluative points for a limited number of situations.
3	Demonstrate relevant scientific knowledge and understanding using scientific terminology in familiar contexts and rarely with unfamiliar. Long term retention of knowledge presents a challenge but is present for a number of topic areas but can lack detail. Correct application to both familiar and unfamiliar contexts is rare.	Basic calculations can be correctly done in a range of circumstances.	Able to identify and correctly describe a pattern using the correct variables for data provided in simple formats. Draw simple conclusions from qualitative or quantitative data. For a limited number of simpler topics areas, the student is able to use their knowledge and understanding to give a basic reason for the pattern.	Able to make basic comments relating to experimental methods with suggestions for improvements in a limited number of simple investigations. For required practicals the student is able to give some evaluative points based on knowledge gained through study with occasional breadth.
4	Demonstrate accuracy and appropriate knowledge and understanding in a number of different topic areas. In some cases, this knowledge can be partially applied to unfamiliar contexts as well as familiar. Students have difficulty in retaining the detail of factual content over the long term.	In some circumstances the student attempts appropriate mathematical skills to perform multi-step calculations but there are occasional errors in procedure. Basic calculations can be correctly done in a range of circumstances.	Analyse qualitative and some quantitative data and occasionally draw plausible conclusions. Simple descriptions of data can be made, and occasionally basic knowledge and understanding can be used to explain situations. This level of analysis and explanation is limited to a few basic formats of tabulates and graphical data where situations are familiar.	Able to make basic and occasionally more in-depth comments relating to experimental methods with occasional suggestions for improvements. For required practicals the student is able to give some evaluative points in based on knowledge gained through study and occasionally based on information provided in the question.
5	Demonstrate mostly accurate and appropriate knowledge and understanding and apply these mostly correctly to familiar and unfamiliar contexts, using mostly accurate scientific terminology. There is loss in the retention of detail in a number of topic areas over the long term.	Use appropriate mathematical skills to perform multi-step calculations. Complex calculations are attempted but there are errors in procedures.	I can analyse a range of data and draw conclusions from it. I can support my conclusions with some simple evidence. I can use my knowledge and understanding to explain observed patterns.	Able to evaluate methodologies to suggest basic improvements to experimental methods, and comment on scientific conclusions. For required practicals the student is able to give evaluative points within exams based on information provided and knowledge gained whilst studying topics.

Student Matrix

Grade	Knowledge, Understanding, Terminology and Application	Mathematical Skills	Data Analysis	Evaluation
Bronze	<p>I can identify an investigation and link it to the topic.</p> <p>I can understand some of the keywords.</p>	<p>I can perform addition and subtraction calculations with support.</p>	<p>I can make very simple comments about the results of an experiment.</p>	<p>I can put the steps of a simple experimental method in order.</p>
Silver	<p>I can understand some simple scientific ideas.</p> <p>I need support to use keywords.</p>	<p>I can carry out basic calculations without help.</p>	<p>I can identify if there is an increase or decrease in simply presented data.</p>	<p>I can identify human error in scientific methods.</p> <p>I can provide an advantage or disadvantage about how an investigation is carried out.</p>
Gold	<p>I can show some scientific knowledge about a topic.</p> <p>I am starting to use some keywords more often.</p>	<p>I can attempt simple calculations but often make some mistakes.</p>	<p>I can identify increases and decreases and sometimes identify patterns in simple data.</p>	<p>I can explain how human error can affect experimental results.</p> <p>I can give simple advantages and disadvantages in familiar topics.</p>
1	<p>I can show some scientific knowledge in a few topic areas.</p> <p>I am using keywords more often in my answers.</p>	<p>I can do some basic calculations in a small number of topics, with some mistakes.</p>	<p>I can identify a simple pattern in data if it is presented in a simple format.</p>	<p>I can give advantages and disadvantages for a small number of topics.</p>
2	<p>I can recall some scientific knowledge and understanding.</p> <p>I can use scientific keywords in my answers.</p>	<p>I can do basic calculations in some areas.</p>	<p>I can identify the variables in an investigation.</p> <p>I can describe a pattern in data.</p> <p>I can draw simple conclusions from the results of an investigation.</p>	<p>I can make basic comments about how good an experimental method is.</p> <p>I can provide some evaluative points for a limited number of situations.</p>
3	<p>I can show scientific knowledge and understanding.</p> <p>I can use keywords if working on a familiar topic.</p> <p>I can recall some details about the topic I am studying but my answers can lack detail.</p>	<p>I can do basic calculations correctly in a range of circumstances.</p> <p>I can construct graphs with help.</p>	<p>I can identify the variables in an investigation.</p> <p>I can describe a pattern in data.</p> <p>I can draw conclusions from the results of an investigation.</p> <p>I am starting to provide basic reasons for patterns in investigations.</p>	<p>I can provide basic suggestions for improvements to investigations.</p> <p>Some of these points are based on knowledge gained through study.</p>
4	<p>I can show knowledge and understanding in a number of different topic areas.</p> <p>I can apply knowledge to familiar situations, and I am starting to apply knowledge to new situations.</p>	<p>I can complete basic calculations correctly, in a range of topics.</p> <p>I can attempt multi-step calculations with some errors.</p> <p>I can draw graphs accurately, with some errors.</p>	<p>I can analyse data and draw a simple conclusion.</p> <p>I can apply my knowledge to explain situations.</p>	<p>I can make comments relating to experimental methods and sometimes suggest improvements.</p> <p>I am able to evaluate investigations based on my own knowledge.</p>
5	<p>I can often show knowledge and understanding in a number of different topic areas.</p> <p>I often use the correct keywords to explain myself.</p> <p>I can apply my knowledge to familiar and new situations.</p>	<p>I can attempt complex calculations with some errors.</p> <p>I can use a range of maths skills to preform multi-step calculations.</p> <p>I can identify the type of graph to use and draw it with few errors.</p>	<p>I can use a range of data to draw a conclusion and support it with evidence.</p> <p>I can apply my knowledge to explain observed patterns.</p>	<p>I can evaluate investigations and suggest improvements to the method.</p> <p>I can comment on scientific conclusions from my investigations.</p> <p>I can evaluate a situation, based on the information provided and my own knowledge and understanding.</p>