School Assessment – Advice from Chief Assessor

**Assessment Type 1: Investigations Folio**

While COVID flexibilities enabled teachers to adjust their Learning and Assessment Plans, the Investigations Folio still needed to include a minimum of 2 practical tasks and one Science as a Human Endeavour investigation. In the practical investigations, the students should have had at least one opportunity to deconstruct a problem for which the outcome is uncertain. They should then design a method to investigate one aspect of this problem. The design of method should not just be a repeat of existing methods.

Assessment design criteria to be used for this assessment type are Investigation, Analysis and Evaluation and Knowledge and Application.

Teachers should ensure that they are using the current subject outline and the current performance standards to assess their students’ work.

These tasks do not carry individual weightings.

The more successful responses commonly:

DECONSTRUCT

* provided detailed evidence of their deconstruction within the maximum of four sides of an A4 page (IAE1/KA4)
* constructed hypothesises using appropriate scientific conventions rather than forms such as: “I guess that X will happen” or “The reaction will increase as the temperature rises because there is an increase in kinetic energy and velocity resulting in molecules reaching the activation energy and increasing the reaction of the enzyme.” (IAE1)
* provided an individual, creative, and thoughtful deconstruction of a problem for which the outcome was uncertain. (IAE1)
* from their deconstruction, developed a clear, logical design to investigation one aspect of the problem in which a single variable was manipulated (IAE1)
* produced a design which included a detailed list of materials and a method in a well-structured format and with sufficient detail that it could be implemented without further information. There were also justifications for the materials chosen and the method suggested. For example, reasons for choosing a particular range of pHs, or a specific number of samples for each concentration of plant hormone. (IAE1)
* identified factors which could not be controlled and why they could not be controlled (IAE1/KA4)
* included a blank data table with correct columns and headings (including units) that could be used to record the data collected. This provides evidence of both an understanding of sample size, measurement to be made and representation of data (IAE1/IAE2)
* made it clear where the four A4 pages of their deconstruction and design finished and where the report on their investigation began (KA4)

PRACTIAL REPORTS

* recognised that the Introduction of their investigation report incorporating the hypothesis and variables is included in the 1500-word count and hence provided concise and relevant information (KA4)
* followed the specifications that are shown in the subject outline for a practical report (KA4)
* represented their data in a simple, concise manner using appropriate conventions for tabulation and graphing (IAE2)
* wrote analyses of their data which were logical and critical, rather than essentially just describing what the data table and/or graphs showed. They made reference to specific data points or specific trends in their analysis and linked the trends to relevant biological concepts. They made logical conclusions with clear justification based on the data they had collected (IAE3)
* undertook critical evaluation of the procedure they had used in their investigation by considering the likely random and systematic errors, rather than noting that they ran out of time, made mistakes reading measurements or dropping equipment. They connected errors to the effect they had on the data (IAE4)

SHE REPORTS

* explored, in their Science as a Human Endeavour report, a contemporary direction of scientific research or innovation related to Stage 2 Biology and clearly linked it to one of the SHE key concepts. They narrowed their discussion down to one of the elaborations to provide evidence of their depth of understanding of the interaction between science and society rather than trying to cover the key concepts too broadly (KA3, KA4)
* in both their SHE task and their investigation reports, showed biological knowledge that was relevant to the topic and was detailed enough to be at Stage 2 standard (KA1)
* providing specific sources/evidence for each main point (KA4).

The less successful responses commonly:

DECONSTRUCT

* deconstructed a problem that had little connection to a Stage 2 Biology topic or even, in some cases, to a Stage 1 Biology topic (IAE1)
* omitted to identify the deconstruction question (IAE1)
* designed investigations with multiple independent or dependant variables (IAE1)
* ‘deconstructed’ a problem for which the outcome was well-known (e.g. the effect of pH on enzyme activity) or used a ‘design’ that simply repeated existing experiments (e.g. using liver and hydrogen peroxide) (IAE1)
* based their deconstruction and design investigation on a heavily scaffolded or structured ‘question and answer’ task sheet. This restricted the student’s potential to demonstrate depth in their problem-solving or creative deconstruction and design (IAE1)
* provided very vague deconstruction and design elements with an aim and hypothesis that were not specific and often included multiple variables (IAE1)
* failed to use a suitable sample size and offered sparse instructions for the method (IAE1)
* repeated much of the information from their deconstruction in the report of their investigation whereas a summary would be sufficient (KA4)

PRACTICAL REPORTS

* represented data using tables which:
* did not employ appropriate column and row structure
* repeated units in each cell rather than in the heading of the column
* lacked a column for the average
* used a random mix of significant figures (IAE2).
* graphed results with:
* incorrect scales
* lack of labels or incorrect labels
* incorrect type of graph according to the data obtained. For example, using a bar graph when a line graph should be used, using a dot-to dot graph when a line of best fit should be used
* relied on graphing programs to graph the data without choosing the correct graphing parameters in the graphing program, hence creating a graph that was not the appropriate style (IAE2).
* showed a lack of understanding of terms such as validity, reliability, precision, and accuracy (IAE4)
* used generic terms and/or only definitions when attempting to assess errors and their effect on the data. (IAE4)
* misunderstood that the limitations that are referred to in the Science Inquiry Skills section of the subject outline (Recognise the limitations of conclusions). They referred to aspects of the procedure such as running out of time or not having enough equipment, or group members not making correct reading. They have not recognised that any conclusion they could make was limited by the tests that they carried out. Examples of such limitations may include: only testing a small range of temperatures or pHs, having tested a single type of plant, hand sanitiser, or bacterium (IAE4)
* made conclusions which did not reflect the data that had been obtained (IAE3)
* exceeded the specified word count in their investigation report (KA4). Reasons for this included:
* putting an excessive amount of background research into their introduction
* not realising that the word count includes the hypothesis and any discussion of variables
* repeating the information in the data tables and/or graphs by describing them again in words rather than summarising the trend before analysing them
* discussing improvements or enhancements, a requirement that is not in the current subject outline.

SHE REPORTS

* selected a Science as a Human Endeavour key concept such as ‘Development’ as the focus of their investigation, then only gave a history of the technique or innovative direction rather than relating it to the interaction between science and society (KA3)
* dwelt too much on the biological background of the chosen topic in the SHE report instead of showing evidence of the interaction between science and society (KA3/KA4)
* chose to investigate a contemporary topic that had little connection to Stage 2 Biology and hence they found it difficult to explain the biological concepts involved (KA4).

Teachers are reminded that copies of research materials and/or the evaluation of source material is no longer part of the evidence required in Assessment Type 1 and should not be included in uploaded materials.

It is recommended that teachers include an assessment of all the specific features that are relevant to the assessment type in their PSR.

Many teachers omitted a record of their assessment of KA3 in AT1, even though this is the prime Assessment Type for the assessment of this specific feature.

The specific features on the PSR should be congruent with what is assessed in the tasks and with what is identified in the LAP.