# Applied Science ASC2: Grade descriptors

* Please note for 2022, students are still required to follow all six of these listed activities but in recognition of the difficulties faced by some students in some centres, we have reduced the number of activities that students are required to carry out through direct hands on lab work.

For 2022 only, students are allowed to follow the standard procedure stated in either PO1(a) or PO1(b) '*whilst it is conducted through a demonstration or simulation provided by their teacher*' as long as they follow the other procedure by '*directly carrying out hands on lab work*'; the same permission applies to PO2(a) and PO2(b) and to PO3(a) and PO3(b).

Please note: In all six activities, students must provide evidence that they have recognised and understood the steps in the standard procedure stated and recorded the data obtained from each procedure independently, in order to meet the criteria listed above.

The above notes apply to:

- PO1(a)
- PO1(b)
- PO2(a)
- PO2(b)
- PO3(a)
- PO3(b)

| | To achieve a pass the learner must evidence that they can: | | In addition to the pass criteria, to achieve a merit the learner must evidence that they can: | | In addition to fulfilling the pass and merit criteria, to achieve a distinction the learner must evidence that they can: | |
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| | **Pass Criteria** | ✓ | **Merit Criteria** | ✓ | **Distinction Criteria** | ✓ |
| **PO1 Biology** | **P1** Outline the uses of physiological measurements of respiration and photosynthesis. | | **M1** Explain the scientific principles of physiological measurements. | | **D1** Explain how these physiological measurements can be applied in a medical or commercial context. | |
| **PO1(a) Rate of respiration** | **P2** Follow* a standard procedure to measure the effect of varying **one** given factor on the rate of respiration of a living organism | | **M2** Use formulas / calculations graphical representations to explain the data. | | **D2** Evaluate the results and the method used. | |
| **PO1(b) The light dependent Hill reaction** | **P3** Follow* a standard procedure to measure the Hill reaction and record results. | | **M3** Explain how this standard procedure could be adapted to investigate **three** limiting factors. | | | |
| **PO2 Chemistry** | **P4** Outline basic principles and uses of volumetric analysis and colorimetry | | **M4** Explain the scientific principles of: volumetric analysis and colorimetry with reference to: standard solutions, choice of indicators, consideration of the Beer-Lambert Law. | | | |
| **PO2(a) Volumetric analysis** | **P5** Follow* a standard procedure for volumetric analysis by: preparing a standard solution, carrying out a titration, recording all measurements and data | | **M5** Carry out calculations that support:<br>• preparation of the standard solution<br>• the titration | | **D3** Explore how the technique is used in industry, with reference to accuracy and precision and the use of primary standards. | |
| **PO2(b) Colorimetric analysis** | **P6** Follow* a standard procedure for colorimetric analysis using solution dilutions, by recording all data and measurements, producing a calibration graph, determining the unknown concn | | **M6** Explain the choice of filter/wavelength, describe any inconsistencies in the data recorded making reference to the Beer-Lambert Law. | | **D4** Evaluate the outcome of analysis with reference to precision, reliability and accuracy. | |
| **PO3 Physics** | **P7** Explain the terms:<br>• resistivity<br>• specific heat capacity (SHC)<br>in relation to material properties | | **M7** Describe how the values of resistivity and SHC determine the uses of materials in industry. | | | |
| **PO3(a) Resistivity** | **P8** Follow* a standard procedure to measure the resistivity of **one** material and record results. | | **M8** Compare results in resistivity with industry standard data, accounting for anomalous readings | | **D5** Compare the methods used in industry to measure resistivity of materials, including levels of accuracy and precision. | |
| **PO3(b) Specific heat capacity** | **P9** Follow* a standard procedure to measure the SHC of **one** material and record results | | **M9** Calculate percentage error and produce a graph to show change in temperature of **one** material over time and explain the shape of the graph. | | **D6** Explain how this standard procedure could be adapted to measure the SHC of a material which is in a different phase. | |
| **PO4 RAs** | **P10** In using experimental techniques: safely use a range of practical equipment and materials, identify hazards, Produce RAs for **one** experiment from **each** of B,C,P | | | | | |
| | **Pass Criteria Met:** | | **Merit Criteria met:** | | **Distinction Criteria Met:** | |
| | **Overall Total (max 25):** | | | | | |