

A L e v e l P h y s i c s

OCR Physics Specification A - H156/H556

Module 1: Development of Practical Skills in Physics

| **You should be able to demonstrate and**  **show your understanding of:** | **Progress and understanding:** | | | |
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| **1** | **2** | **3** | **4** |
| **1.1 Practical skills assessed in the written exam** | | | | |
| Experimental design, including solving problems set in a practical context and including the selection of suitable apparatus, equipment and techniques for the proposed experiment. |  |  |  |  |
| Identification of variables that must be controlled, where appropriate. |  |  |  |  |
| Evaluation that an experimental method is appropriate to meet the expected outcomes. |  |  |  |  |
| How to use a wide range of practical apparatus and techniques correctly as outlined in this specification. |  |  |  |  |
| Appropriate units for measurements. |  |  |  |  |
| Presenting observations and data in an appropriate format. |  |  |  |  |
| Processing, analysing and interpreting qualitative and quantitative experimental results, including reaching valid conclusions where appropriate. |  |  |  |  |
| Use of appropriate mathematical skills for analysis of quantitative data. |  |  |  |  |
| Appropriate use of significant figures. |  |  |  |  |
| Plotting and interpreting suitable graphs from experimental results, including:   1. selection and labelling of axes with appropriate scales, quantities and units. 2. measurement of gradients and intercepts. |  |  |  |  |
| How to evaluate results and draw conclusions. |  |  |  |  |
| The identification of anomalies in experimental measurements. |  |  |  |  |
| The limitations in experimental procedures. |  |  |  |  |
| Precision and accuracy of measurements and data, including margins of error, calculating percentage errors and uncertainties in apparatus. |  |  |  |  |
| The refining of experimental design by suggestion of improvements to the procedures and apparatus. |  |  |  |  |
| **1.2 Practical skills assessed in the practical endorsement [A Level only]** | | | | |
| Apply investigative approaches and methods to practical work including how to solve problems in a practical context. |  |  |  |  |
| Safely and correctly use a range of practical equipment and materials including identification of potential hazards and how to minimise the risks involved. |  |  |  |  |
| Follow written instructions. |  |  |  |  |
| Make and record observations/measurements. |  |  |  |  |
| Keep appropriate records of experimental activities. |  |  |  |  |
| Present information and data in a scientific way. |  |  |  |  |
| Use appropriate software and tools to process data, carry out research and report findings. |  |  |  |  |
| Use online and offline research skills including websites, textbooks and other printed scientific sources of information. |  |  |  |  |
| Correctly cite sources of information using either the Vancouver or Harvard referencing system. |  |  |  |  |
| Use a wide range of experimental and practical instruments, equipment and techniques appropriate to the knowledge and understanding included in the specification. |  |  |  |  |
| Use of appropriate analogue apparatus to record a range of measurements (to include length/distance, temperature, pressure, force, angles and volume) and to interpolate between scale markings . |  |  |  |  |
| Use of appropriate digital instruments, including electrical multimeters, to obtain a range of measurements (to include time, current, voltage, resistance and mass). |  |  |  |  |
| Use of methods to increase accuracy of measurements, such as timing over multiple oscillations, or use of fiduciary marker, set square or plumb line. |  |  |  |  |
| Use of a stopwatch or light gates for timing. |  |  |  |  |
| Use of calipers and micrometers for small distances, using digital or vernier scales. |  |  |  |  |
| Correctly constructing circuits from circuit diagrams using DC power supplies, cells, and a range of circuit components, including those where polarity is important (e.g diodes). |  |  |  |  |
| Designing, constructing and checking circuits using DC power supplies, cells, and a range of circuit components. |  |  |  |  |
| Use of a signal generator and oscilloscope, including volts/division and time-base. |  |  |  |  |
| Generating and measuring waves, using microphone and loudspeaker, or ripple tank, or vibration transducer, or microwave/radio wave source. |  |  |  |  |
| Use of a laser or light source to investigate characteristics of light, including interference and diffraction. |  |  |  |  |
| Use of ICT such as computer modelling, or data logger with a variety of sensors to collect data, or use of software to process data. |  |  |  |  |
| Use of ionising radiation, including detectors. |  |  |  |  |

The material in this checklist is based on the OCR Physics A Specification published at [ocr.org.uk/**alevelphysicsa**](http://www.ocr.org.uk/qualifications/as-a-level-gce-physics-a-h156-h556-from-2015/) by Oxford, Cambridge and RSA Examinations.