**Yr11 Investigating Science Depth Study Marking Rubric**

**Name(s): Title: Class:**

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| **Curriculum****Outcomes****Skills** | **Descriptor** | **Depth Study****Reference** | **Above Stage** | **At stage** | **Beginning Stage** |
| **Questioning and predicting\*****INS11-1** **(Section 1 and 2 of Depth Study)** | develops and evaluates questions and hypotheses for scientific investigation | **Questioning*** 1. Q 6,
	2. Q 1, 2, 3
	3. Q 1, 2, 3,
	4. Q 1, 2

**Predicting****2.2 & 2.6** Q 2 | ● develops and evaluates a range of inquiry questions and hypotheses to identify an original concept that can be investigated scientifically, involving original primary data and clearly linked to and supported by secondary data ● multiple reviews and justified modifications of questions and hypotheses to reflect growing depth of knowledge and incorporation of new evidence | ● develops and evaluates inquiry questions and hypotheses to identify a concept that can be investigated scientifically, involving primary and secondary data ● single modification of questions and hypotheses to reflect new evidence | ● develops an inquiry question and hypotheses to identify a concept that can be investigated scientifically, involving primary and/or secondary data ● modifies question or hypotheses |
| **Planning investigations****INS11-2****(Section 2 of Depth Study)**  | designs and evaluates investigations in order to obtain primary and secondary data and information | **Aim****2.1****Variables****1.1** Q 1, 2, 3, 4, 5**2.3** Q 1, 2, 3, 4**Designing****2.5** Q2 & **3.1****Method & Risk****2.7 & 2.8** | ● assesses more than 2 risks, and selects appropriate materials and technologies when designing and planning an original investigation ● justifies and evaluates the use of dependent and independent variables and experimental controls to ensure that a valid procedure is developed that allows for the reliable collection of data. Attention to detail in method when identifying and avoiding influence of controlled variables. ● evaluates, modifies and justifies an investigation in response to new evidence  | ● assesses two risks, and selects appropriate materials and technologies when designing and planning an investigation ● justifies and evaluates the use of dependent and independent variables and experimental controls to ensure that a valid procedure is developed that allows for the reliable collection of data ● evaluates and modifies an investigation in response to new evidence  | ●identifies a risk, and/or selects appropriate materials or technologies when designing and planning an investigation ● justifies and/or evaluates the use of variables and/or experimental controls for a mostly valid procedure that allows for repetition of data● modifies an investigation in response to new evidence  |
| **Conducting Investigations** **INS11-3****(Section 2 and 3 of Depth Study)** | conducts investigations to collect valid and reliable primary and secondary data and information | **Secondary source research****2.4** Q 1, 2, 3, 4**2.5** Q1**Data collection****3.2 & 3.3****Referencing****2.4** Q4**Bibliography**Section 5 | ● employ, evaluates and documents safe work practices and managed risks● uses appropriate technologies to ensure and evaluate accuracy ● selects, extracts and cross references information from a wide range of reliable secondary sources and acknowledges them using an accepted referencing style | ● employs and evaluates safe work practices and manages risks ● uses appropriate technologies to ensure and evaluate accuracy ● selects and extracts information from a wide range of reliable secondary sources and acknowledges them using an accepted referencing style | ● employs safe work practices● uses appropriate technologies to ensure accuracy ● selects and/or extracts information from reliable secondary sources and acknowledges them using a referencing style |
| **Processing data and information****INS11-4****Analysing data and information****INS11-5** **Problem Solving****INS11-6** **(Section 3 and 4 of Depth Study)** | 11-4 selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media 11-5 analyses and evaluates primary and secondary data and information11.6 solves scientific problems using primary and secondary data, critical thinking skills and scientific processes | **Data representation****3.3** Graph**4.3** Sankey**Data trends****4.1** Q1, 2**Assessment****4.2** Q1, 2, 3, 4**Problem Solving****4.6** Q1, 2, 3 & **4.7**  | ● selects qualitative and quantitative data and information and represents them using a range of formats, digital technologies and appropriate media ● evaluates, improves and justifies the quality of data● derive trends, patterns and relationships in data and information ● assess error, uncertainty and limitations in data ● assess the relevance, accuracy, validity and reliability of primary and secondary data and suggest improvements to investigations● use modeling (including mathematical examples) to explain phenomena, make predictions and solve problems using evidence from primary and secondary sources ● use scientific evidence and critical thinking skills to solve problems | ● selects qualitative and quantitative data and information and represents them using a range of formats, digital technologies and appropriate media ● evaluates and improves the quality of data ● derive trends, patterns and relationships in data and information ● assesses error, uncertainty and limitations in data ● assesses the relevance, accuracy, validity and reliability of primary and secondary data and suggest improvements to investigations● use modeling (including mathematical examples) to explain phenomena, make predictions and solve problems using evidence from primary and secondary sources ● use scientific evidence and critical thinking skills to solve problems | ● selects qualitative and/or quantitative data and/or information and represents them ● improves the quality of data ● derives a trend, pattern or relationship in data and information ● assess an error, uncertainty or limitations in data ● assess the relevance, accuracy, validity and/or reliability of primary and/or secondary data and suggests an improvement to investigations● uses modeling to explain phenomena, make predictions and/or solve problems using evidence from primary and/or secondary sources ● use scientific evidence and/or critical thinking skills to solve problems |
| **Communicating\*****INS11-7** (**Section 5 of Depth Study)** | communicates scientific understanding using suitable language and terminology for a specific audience or purpose | **Planning communication****Section 5**Q1, 2, 3, 4, 5&**Actual communication of investigation** | ● selects and uses suitable forms of digital, visual, written and oral forms of communication ● selects and always applies appropriate scientific notations, nomenclature and scientific language to communicate in a variety of contexts ● constructs evidence-based arguments with strong links to collected data. Engages in peer feedback to evaluate an argument or conclusion, incorporates that feedback into Depth Study | ● selects and uses suitable forms of digital, visual, written and/or oral forms of communication ● selects and mostly applies appropriate scientific notations, nomenclature and scientific language to communicate in a variety of contexts ● constructs evidence-based arguments and engages in peer feedback to evaluate an argument or conclusion | ● selects or uses digital, visual, written and/or oral forms of communication ● selects or applies scientific notations, nomenclature and/or scientific language to communicate in a variety of contexts ● constructs arguments  |
| **Curriculum****Outcomes****Content** | **Inquiry Questions** | **Depth Study****Reference** | **Above Stage** | **At stage** | **Beginning Stage** |
| **Scientific Models****INS11-10\***develops, and engages with, modeling as an aid in predicting and simplifying scientific objects and processes  | **Models to Inform Understanding** What is a scientific model?What makes scientific models useful?  | **Role of a Model****4.4** Q1, 2, 3, 4**Strengths and Limitations****4.5** Q1, 2 | ● examines 3 or more types and use of models that may be used in science – with specific relevance to the Depth Study● explains how scientific models are used to make predictions that are difficult to analyse in the real world due to time frames, size, cost and other limitations● assesses the effectiveness of models at facilitating the understanding of scientific processes and concepts | ● examines 1 or 2 types and uses of models that may be used in science – with relevance to the Depth Study● explains how scientific models are used to make predictions that are difficult to analyse in the real world due to time frames, size and cost ● assesses the effectiveness of models at facilitating the understanding of scientific processes | ● examines the types or use of models that may be used in science● identifies how scientific models are used to make predictions● identifies how models can facilitating the understanding of scientific processes |
| **Constructing a Model** How can a model be constructed to simplify understanding of a scientific concept | **Model planning and Building****2.5** Q2**3.1** | ● investigates a scientific concept and process that can be represented using a model, by: – planning a model with reference to the scientific literature and clear and extensive incorporation of the literature findings into the building of the model– constructing a model using appropriate resources beyond the ATSE kit to represent the selected scientific concept | ● investigates a scientific concept or process that can be represented using a model, by: – planning a model with reference to the scientific literature – constructing a model using appropriate resources to represent the selected scientific concept  | ● investigates a scientific concept or process that can be represented using a model, by: – planning a model – constructing a model using appropriate resources |
| Comment: |

\*Compulsory section of Depth Study (Note: any one of the 4 Modules can be extended)