# Sample Assessment Task Year 11

# Investigating Science

## Sample for implementation for Year 11 from 2018

### Context

Theories provide a coherent understanding of a wide range of phenomena. A law is usually a statement that can be expressed as a mathematical relationship. It describes phenomena in nature, with no exceptions, at a point in time. Testing scientific theories drives scientific breakthroughs and questions current understandings. Students examine how complex models and theories have developed.

| Task number: 2 | Weighting: 30% | Timing: Term 3, Week 6 |
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| Outcomes assessed A student:   * selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media INS11/12-4 * analyses and evaluates primary and secondary data and information INS11/12-5 * solves scientific problems using primary and secondary data, critical thinking skills and scientific processes INS11/12-6 * communicates scientific understanding using suitable language and terminology for a specific audience or purpose INS11/12-7 * describes and assesses how scientific explanations, laws and theories have developed INS11-11 | | |

| Nature of the task: **Research and Presentation**  **Scenario:**  You are a reporter for a scientific journal and you have been sent on a fact finding mission to find information about an issue which is associated with commonly held assumptions. This assignment for the upcoming edition dealing with informing readers about how scientific understandings change over time. The Chief Editor has given you a choice of topics you can investigate for this mission. You can choose from one of the following:   * spontaneous generation and the investigations that led to the proposal of the germ theory * radioactivity: including the work of Henri Becquerel and Marie Curie * phlogiston theory * human influences on atmospheric pollution * steady state theory of the Universe * discovery of the electron which challenged the Dalton model of the atom including Thompson’s experiment and Rutherford’s gold foil experiment * explanations of superconductivity   In order to have your article published, however, you need to prepare a presentation to the Chief Editor and company board.  The following information must be included in the presentation:   * description of previous understanding of the concept * evidence on which this understanding was based * description of the new understanding * how the new understanding was developed (description of experiment or analysis of data) * the technologies that needed to be developed that allowed for the advancement of scientific understanding   You can choose a digital platform for your presentation, eg: Prezi, pencast, podcast, iMovie. Your presentation must be no longer than 5 minutes and you will have a written word limit of 20 words for the entire presentation. You will then prepare an article for the journal which covers the main points identified in no more than 1000 words which will be submitted on the due date (even though you may not present on this day).  Your article must have your references listed at the end using an accepted format.  **Key Dates:**  Proposed idea to Chief Editor (your teacher): ***Week 2***  Draft article to Chief Editor: ***Week 4***  Due date for article and presentation: ***Week 6***  **Resources:**  Various scientific journals |
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| **Success in this task will be reflected in the student’s ability to:**   * Select an assumption that makes links between this assumption and other content areas. * Use scientific terminology correctly and accurately in the presentation and article. * Utilise ICT to prepare a presentation about the selected assumption. * Demonstrate the ability to apply critical and creative thinking skills to communicate information and provide solutions to problems. * Utilise qualitative and quantitative data to validate statements and ideas. |

### Marking guidelines

| A student: | Marks |
| --- | --- |
| * demonstrates extensive knowledge and understanding of the selected assumption including complex relationships within the content * displays an outstanding ability to describe and assess how scientific explanations, laws and theories have developed abstract ideas, clearly and accurately * applies a high level of creative and critical thinking skills in developing an appropriate digital presentation and article including related content from other focus points and topics * demonstrates a high level of ability to analyse and evaluate primary and secondary data and information * shows extensive competence in selecting and processing appropriate qualitative and quantitative data and information using a range of appropriate media * communicates succinctly, logically and sequentially using qualitative and quantitative data to support findings and ideas | 21 – 25 |
| * demonstrates thorough knowledge and understanding of the selected assumption including complex relationships within the content * displays an effective ability to describe and assess how scientific explanations, laws and theories have developed abstract ideas, clearly and accurately * applies an excellent level of creative and critical thinking skills in developing an appropriate digital presentation and article including related content from other focus points and topics * demonstrates a comprehensive ability to analyse and evaluate primary and secondary data and information * shows competence in selecting and processing appropriate qualitative and quantitative data and information using a range of appropriate media * capably communicates succinctly, logically and sequentially using qualitative and quantitative data to support findings and ideas | 16 – 20 |
| * demonstrates sound knowledge and understanding of the selected assumption including relationships within the content * displays a clear ability to describe how scientific explanations, laws and theories have developed abstract ideas, clearly and accurately * applies a broad level of creative thinking skills in developing an appropriate digital presentation and article including related content from other focus points and topics * demonstrates a sound ability to analyse and/or evaluate primary and secondary data and information * selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media * communicates succinctly, logically and sequentially using qualitative and quantitative data to support findings and ideas | 11 – 15 |
| * demonstrates basic knowledge of the selected assumption including some relationships within the content * displays a limited ability to describe how scientific explanations, laws and theories have developed abstract ideas * limited evidence of creative thinking skills in developing an appropriate digital presentation and article including some basic links with related content from other focus points and topics * demonstrates an elementary ability to analyse and/or evaluate primary and secondary data and information * selects and processes limited qualitative and quantitative data and information using appropriate media * communicates using qualitative and quantitative data to support findings and ideas | 5 – 10 |
| * demonstrates limited knowledge of the selected assumption * displays a very limited ability to describe how scientific explanations, laws and theories have developed abstract ideas * develops a digital presentation and article which includes some basic links with related content from other focus points * demonstrates an elementary ability to select appropriate secondary data and information * shows very basic competence in selecting and processing fundamental qualitative and quantitative data and information using a range of appropriate media * communicates using qualitative or quantitative data to support findings and ideas | <5 |

| **Feedback: Student** |
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| **I think I demonstrated proficiency in these areas of the assessment:** |
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| **I think I need to work on these areas for future success:** |
|  |
| **My plan for achieving success in these areas is to:** |
|  |
| **Feedback: Teacher** |
| **You demonstrated proficiency in these areas of the assessment:** |
|  |
| **You need to work on these areas of the assessment in the future:** |
|  |
| **Some ideas to help you achieve success in these areas include:** |
|  |