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| **GOOD COUNSEL COLLEGE** |
| **SCIENCE DEPARTMENT** |
| STUDENT NAME: |
| TEACHER CODE: SMIS |



**ASSESSMENT ITEM 01**

**Student Experiment**

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| **ASSESSMENT CONDITIONS** |
| **Date Received:** Start of week 7  **Time Given:** 3 weeks  **Checkpoint:** End of week 8  **Due Date:** End of week 9 |

**YEAR 10 SCIENCE**

Physical Sciences

**SEMESTER 1, 2022**

**TOPIC ASSESSED:**

Force

**CRITERIA ASSESSED:**

Science Understanding

Science Inquiry Skills

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| **Assessment Instructions:**   1. Individual reports must be written. 2. Word count: 600-800. 3. References: all researched information must be cited, and a reference list included according to APA standards. 4. Assignment to be completed in accordance with the school assessment policy. |

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| **SUMMARY OF RESULTS** | | | | | |
| **CRITERIA ASSESSED** | **STANDARD** | | | | |
| **A** | **B** | **C** | **D** | **E** |
| Science Understanding |  |  |  |  |  |
| Science inquiry skills |  |  |  |  |  |

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| **Cognitive Verbs** | | | | | |
| **Retrieval & Comprehension** | | **Analysis** | | **Knowledge Utilisation** | |
| Calculate  Clarify  Comprehend  Construct (eg. a diagram)  Define  Demonstrate  Describe  Document  Execute  Explain | Identify  Implement (a plan or proposal)  Recall  Recognise (eg features)  Sketch  Summarise  Symbolise  Understand  Use | Analyse  Apply  Categorise  Classify  Compare  Consider  Contrast  Critique  Deduce  Derive | Determine  Differentiate  Discriminate  Distinguish  Identify (errors/problems)  Infer/Extrapolate  Interpret  Judge  Organise / sequence / structure  Reflect (on) | Appraise  Appreciate  Argue  Assess  Comment (make a judgment)  Conduct (eg investigations)  Construct (eg an argument)  Create (eg a unique product; language texts; meaning)  Decide/determine  Design (eg a methodology, proposal)  Develop (a strategy, product or process)  Devise  Discuss/explore | Evaluate  Experiment/test  Express  Generate/test (eg hypotheses)  Hypothesise/propose (eg arguments, solutions, ideas)  Investigate/examine  Justify/prove  Make Decisions  Manipulate (eg language texts, skills, tech)  Modify  Predict  Realise/Resolve  Solve  Synthesise |

**Marking Criteria – Year 10 Research Investigation: Force**

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|  | A | B | C | | D | E | |
|  | The student work has the following characteristics: | The student work has the following characteristics: | The student work has the following characteristics: | The student work has the following characteristics: | | The student work has the following characteristics: | |
| Science Understanding | Justified explanation of the concept of energy conservation and accurate representation of energy transfer and transformation within systems | Informed explanation of the concept of energy conservation and detailed representation of energy transfer and transformation within systems | Explanation of the concept of energy conservation and representation of energy transfer and transformation within systems | Description of the concept of energy conservation and partial representation of energy transfer and transformation within systems | | Statements about energy  and motion | |
| Science inquiry skills | Questioning and prediction | | | | | | |
| Development of justified questions that can be investigated scientifically | Development of informed question that can be investigated scientifically | Development of question that can be investigated | Guided development of question | | Directed development of question | |
| Planning and conducting | | | | | | |
| Independent design and justified improvements to appropriate methods of investigation  Explanation of how reliability and safety actions are managed in methods | Independent design and  informed improvements to appropriate methods of investigation  Explanation of how the implications of reliability and safety, are considered in methods | Independent design and  improvement of appropriate  methods of investigation  Explanation of how  reliability and safety are  considered in methods | Partial design of methods of  investigation that consider  reliability and safety | | Use of provided methods of  investigation  Identification of safety  considerations | |
| Processing and analysing data and information | | | | | | |
| Identification and justification of plausible alternative explanations for findings and justified explanation of any sources of uncertainty when:   * analysing data * selecting evidence to develop and justify conclusions | Identification of plausible alternative explanations for findings and informed explanation of any sources of uncertainty when:   * analysing data * selecting evidence to develop and justify conclusions | Identification of alternative  explanations for findings and  explanation of any sources of  uncertainty when:   * analysing data * selecting evidence to develop and justify conclusions | * Statements about alternative explanations * Identification of patterns in data * Drawing of conclusions | | Statements about:   * alternative explanations * data and findings | |
| Communicating | | | | | | |
| Concise and coherent communication of science ideas for specific purposes through:   * Construction of justified evidence based arguments * Discerning selection of appropriate representations and text types | Coherent communication of science ideas for specific purposes through:   * Construction of informed evidence based arguments * Informed selection of appropriate representations and text types | Communication of science ideas for specific purposes through:   * Construction of evidence based arguments * Selection of appropriate representations and text types | | Communication of science ideas for specific purposes through:   * Construction of arguments * Selection of representations, everyday language and text types | | Fragmented communication of science ideas for specific purposes |

**Student Experiment - Forces**

**Conditions**

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| Topic: | Forces |
| Duration: | 3 weeks |
| Individual/group: | Individual response   * Student may collaborate to develop the methodology and perform the experiment |
| Resources: | School science laboratory and library (online: internet and  school intranet, databases, journals) |

**Context**

You completed the following practical in class:

* Calculating Acceleration
* Calculating Force
* Calculating energy efficiency

**Task**

Modify (i.e. refine, extend or redirect) an experiment in order to address your own related research question.

You must use the practical performed in class and a related stimulus as the basis for your methodology and research question.

**To complete this task, you must**

* **Identify** an experiment to modify
* **Develop** a research question to be investigated
* **Research** relevant background scientific information to inform the modification of the research question and methodology
* **Conduct** a risk assessment and account for risks in the methodology
* **Conduct** the experiment
* **Collect** sufficient and relevant qualitative and/or quantitative data to address the research question
* **Process** and present the data appropriately
* **Analyse** the evidence to identify trends, patterns or relationships
* **Analyse** the evidence to identify uncertainty and limitations
* **Interpret** the evidence to draw conclusion/s to the research question
* **Evaluate** the reliability and validity of the experimental process
* **Suggest** possible improvements and extensions to the experiment
* **Communicate** findings in an appropriate scientific genre, i.e. scientific report

**Checkpoints**

Term 1 Week 7: Select experiment, identify proposed modifications

Term 1 Week 7 and 8: Develop research question, perform experiment, process data, analyse and evaluate evidence

Term 1 Week 8: Submit draft

Term 1 Week 9: Submit final response

**Authentication strategies**

* You will be provided class time for task completion.
* Your teacher will observe you completing work in class.
* Your teacher will collect and annotate a draft.
* You must acknowledge all sources.
* Your teacher will compare the responses of students who have worked together in groups.