# Sample Assessment Task Year 11 Physics

## Sample for implementation for Year 11 from 2018

### Context:

Newton’s Laws of Motion can be used to describe the effect of forces on the motion of single objects and simple systems. Forces are always produced in pairs that act on different objects and add to zero.

By applying Newton’s laws directly to simple systems, and, where appropriate, the law of conservation of momentum and law of conservation of mechanical energy, students examine the effects of forces. They also examine the interactions and relationships that can occur between objects by modelling and representing these using vectors and equations.

| Task number: 2 | Weighting: 40% | Timing: Due Term 2 Week 9 |
| --- | --- | --- |
| Outcomes assessed: A student:   * + conducts investigations to collect valid and reliable primary and secondary data and information PH11/12-3   + selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media PH11/12-4   + analyses and evaluate primary and secondary data and information PH11/12-5   + communicates scientific understanding using suitable language and terminology for a specific audience or purpose PH11/12-7   + describes and explains events in terms of Newton’s Laws of Motion, the law of conservation of momentum and the law of conservation of energy PH11-9 | | |
| Nature of the task: This individual student task is in three parts:   * Conducting an investigation * Submitting an investigation report * Presenting a four to five minute synopsis of your investigation to the class.   Students select from ONE of the following aims:   * To verify that the net force in two dimensions on an object in static equilibrium is zero * To verify that the work done on an object is equal to its change in kinetic energy * To verify that the work done on an object is equal to its change in gravitational potential energy.   Students will be provided with three hours of class time to plan, choose equipment and resources and perform a first-hand investigation. Students compose an investigation report outlining their investigation process and results (refer to the marking criteria for a breakdown of the components to be assessed).  From the investigation, students are to develop and present a four to five minute presentation summarising their experimental methodology, results, discussion of results and conclusions drawn, in an appropriate format. | | |
| Marking criteria:Knowledge and Understanding – 10 marks  * **PH11-9 Describes and explains events in terms of Newton’s Laws of Motion, the law of conservation of momentum and the law of conservation of energy, particularly:** * apply Newton’s two laws of motion to a static equilibrium situation * apply the law of conservation of mechanical energy to the quantitative analysis of motion.  Conducting Investigations – 10 marks  * **PH11/12-3 Conducts investigations to collect valid and reliable primary and secondary data and information, particularly:** * employs and evaluates safe work practices and manage risks * uses appropriate technologies to ensure and evaluate accuracy.  Processing, Analysing and Communicating – 20 Marks  * **PH11/12-4 Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media, particularly:** * selects qualitative and quantitative data and information and represents them using a range of formats, digital technologies and appropriate media * applies quantitative processes where appropriate * evaluates and improves the quality of data. * **PH11/12-5 Analyses and evaluates primary and secondary data and information, particularly:** * derives 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 suggests improvements to investigations. * **PH11/12-7 Communicates scientific understanding using suitable language and terminology for a specific audience or purpose, particularly:** * selects and uses suitable forms of digital, visual written and/or oral forms of communication * selects and 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. | | |
| Feedback provided: To inform future learning your feedback will consist of:   * written annotations to the submitted report * notes and comments made in real time during the presentation * limited guidance during the three-hour first-hand investigation phase. | | |

### Marking Guidelines

| Outcome | Developing | Elementary | Substantial | High |
| --- | --- | --- | --- | --- |
| **PH11-9 Describes and explains events in terms of Newton’s Laws of Motion, the law of conservation of momentum and the law of conservation of energy**  **Max. Marks 10** | * demonstrates limited knowledge of Newton’s laws of motion law, the law of conservation of momentum and law of conservation of energy   **Marks 1-3** | * states Newton’s laws of motion law, the law of conservation of momentum and law of conservation of energy without application   **Marks 4-5** | * applies Newton’s laws of motion to a static equilibrium situation   or   * apply the conservation of mechanical energy to the quantitative analysis of motion   **Marks 6-8** | * apply Newton’s two laws of motion to a static equilibrium situation   and   * apply the conservation of mechanical energy to the quantitative analysis of motion   **Marks 9-10** |
| **PH11/12-3 Conducts investigations to collect valid and reliable primary and secondary data and information**  **Max. Marks 10** | * requires teacher assistance to conduct the investigation and to select appropriate equipment   **Marks 1-3** | * some suitable equipment is chosen * safe practices are employed * minimal identification of risks   **Marks 4-5** | * provides some evidence of validity reliability of data and sources * safe practices are employed * explanation of risks   **Marks 6-8** | * evaluates validity reliability of data and sources * employs and evaluates safe work practices and manage risks * uses appropriate technologies to ensure and evaluate accuracy * data and source information is included   **Marks 9-10** |
| **PH11/12-4 Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media**  **Max. Marks 7** | * data is disorganised and only one set of data from one experiment present   **Marks 1** | * selects data and information and represents them using a range of formats, digital technologies and appropriate media   **Marks 2-3** | * selects qualitative and quantitative data and information and represents them using a range of formats, digital technologies and appropriate media * applies quantitative processes where appropriate * discusses the reliability and validity of the data   **Marks 4-5** | * selects relevant qualitative and quantitative data and information and represents them using a range of formats, digital technologies and appropriate media * applies quantitative processes where appropriate * evaluates the reliability, validity and accuracy of the data   **Marks 6-7** |
| **PH11/12-5 Analyses and evaluates primary and secondary data and information**  **Max. Marks 7** | * presents data with limited analysis   **Marks 1** | * identifies trends, patterns and relationships in data and information with limited analysis * identifies errors, uncertainty and limitations in data   **Marks 2-3** | * describes trends, patterns and relationships in data and information * describes error, uncertainty and limitations in data   **Marks 4-5** | * explains 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 suggests improvements to investigations   **Marks 6-7** |
| **PH11/12-7 Communicates scientific understanding using suitable language and terminology for a specific audience or purpose**  **Max. Marks 6** | * presents limited information * shows limited understanding of the scientific concepts   **Marks 1** | * communicates basic information through descriptive texts * uses some scientific terminology   **Marks 2** | * presents a well-organized report * selects and uses suitable forms of digital, visual written and/or oral forms of communication * selects and applies appropriate scientific notations, nomenclature and scientific language to communicate   **Marks 3-4** | * presents a sustained, logical and cohesive report supporting conclusions/ideas with evidence * selects and uses effective forms of digital, visual written and/or oral forms of communication * selects and applies appropriate scientific notations, nomenclature and scientific language to communicate in a variety of contexts   **Marks 5-6** |