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Year 9 Physics Homework Booklet



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| --- | --- | --- | --- |
| **­­Homework 1** | Key science terms 1 | Due date: | Completed? |
| **Homework 2** | Maths in physics homework 1 | Due date: | Completed? |
| **Homework 3** | Practical Homework: Forces acting on a rocket | Due date: | Completed? |
| **Homework 4** | Key science terms 2 | Due date: | Completed? |
| **Homework 5** | Maths in physics homework 2 | Due date: | Completed? |
| **Homework 6** | Practical Homework: Plan an investigation into speed | Due date: | Completed? |
| **Homework 7** | Key science terms 3 | Due date: | Completed? |
| **Homework 8**  | Maths in physics 3 | Due date: | Completed? |
| **Homework 9** | Practical Homework – lunar landing module  | Due date: | Completed? |
| **Homework 10** | Key science terms 4 | Due date: | Completed? |
| **Homework 11** | Maths in physics 4 | Due date: | Completed? |
| **Homework 12** | Keyword science 5 | Due date: | Completed? |

**Homework 1 - Key Science Terms 1**

Learn the spelling of the key term and their definition. Use each of the terms in a sentence and bring this to your lesson

|  |  |
| --- | --- |
| **Term**  | **Definition** |
| Variable | These are physical, chemical or biological quantities or characteristics. |
| Categoric variables  | have values that are labels  |
| Continuous variables  | can have values (called a quantity) that can be given a magnitude either by counting or by measurement |
| Control variable  | A variable which may, in addition to the independent variable, affect the outcome of the investigation and therefore has to be kept constant or at least monitored.  |
| Dependent variable  | The variable of which the value is measured for each and every change in the independent variable. |
| Independent variable  | The variable for which values are changed |

History Homework Task Term 5

**Homework 2 – Maths in Science 1**

Complete the questions on the maths in science homework sheet 1

**Homework 3 – Practical Science Homework**

Forces acting on a rocket:

Draw a picture of a rocket or build a model rocket.

State the forces that act on a rocket. Which directions do these forces act in, and how do these directions change during fight?

Challenge - Describe Newton’s three laws of motion and how they are related to the principle of rockets. The link below is one possible source you could use <https://www.grc.nasa.gov/www/k-12/rocket/rktfor.html>

**Homework 4 - Key Science Terms 2**

Learn the spelling of the key term and their definition. Use each of the terms in a sentence and bring this to your lesson

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| **Term**  | **Definition** |
| Accuracy | A measurement result is considered accurate if it is judged to be close to the true value. |
| True value | This is the value that would be obtained in an ideal measurement. |
| Uncertainty  | The interval within which the true value can be expected to lie, with a given level of confidence or probability |
| Calibration | Marking a scale on a measuring instrument.  |
| Data | Information, either qualitative or quantitative, that has been collected. |

**Homework 5 – Maths in Science 2**

Complete the questions on the maths in science homework sheet 2

**Homework 6 – Practical Science Homework**

* Plan a practical to investigate the walking and running speeds of 5 different people (this can be family or friends)

*OR*

* Plan a practical to investigate walking and running speeds on different terrains.
* In your report you should include:
	+ What the independent, dependent and control variables are
	+ A bullet point method you used
	+ Table of results
	+ Conclusion (describe how the independent variable affected the dependent)
	+ Evaluation (how could you improve the validity of the method)

**Homework 7 - Key Science Terms 3**

Learn the spelling of the key term and their definition. Use each of the terms in a sentence and bring this to your lesson

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| **Term**  | **Definition** |
| Measurement error  | The difference between a measured value and the true value.  |
| Anomalies  | A value that doesn’t fit the pattern |
| Random error | These cause readings to be spread about the true value, in an unpredictable way from one measurement to the next. |
| Systematic error | These cause readings to differ from the true value by a consistent amount each time a measurement is made  |
| Zero error | An indication of a false reading measuring system, therefore systematic uncertainty  |

**Homework 8 – Maths in Science 3**

Complete the questions on the maths in science homework sheet 3

**Homework 9 – Practical Science Homework**

Descending to the lunar surface is one of the most critical and difficult phases of a lunar landing. The spacecraft needs to decrease its speed from 6000 km/h in lunar orbit to a few km/h for a soft touchdown. Design, and if you can build, a landing module to secure the survival of the crew (in the form of an egg-naut) landing on the Moon**.**

**Option 1**

**Design on paper** your landing module. State the materials you would use and describe the different design features that would secure the survival of the crew.

**Option 2**

**Design and build a** landing module to secure the survival of the crew in the form of an egg-naut. Use an actual egg (raw or cooked) and then any materials you have at home to build a suitable landing module. Take a picture of landing modular! Or bring it into school

Mark a test-landing site on the ground. You can mark a cross with tape on the floor, or draw a target as a bullseye and rings marking the distance from the centre. Drop your module from a height.

Hand in a report that includes

* Picture of landing module (this can be a drawing or a photo
* Did the module hit the target?
* Did the egg-naut survive (not break)?
* State some improvements you would make
* Describe how you could calculate the velocity and acceleration of your module

**Homework 10 - Key Science Terms 4**

Learn the spelling of the key term and their definition. Use each of the terms in a sentence and bring this to your lesson

|  |  |
| --- | --- |
| **Term**  | **Definition** |
| Range | The maximum and minimum values of the independent or dependent variables  |
| Repeatable  | A measurement is repeatable if the original experimenter repeats the investigation using same method and equipment and obtains the same results. |
| Reproducible  | A measurement is reproducible if the investigation is repeated by another person, or by using different equipment or techniques, and the same results are obtained.  |
| Validity  | Suitability of the investigative procedure to answer the question being asked  |
| Valid conclusion  | A conclusion supported by valid data, obtained from an appropriate experimental design and based on sound reasoning  |

**Homework 11 – Maths in Science 4**

Complete the questions on the maths in science homework sheet 2

**Homework 10 - Key Science Terms 5**

Learn the spelling of the key term and their definition. Use each of the terms in a sentence and bring this to your lesson

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| **Term**  | **Definition** |
| Precision  | Measurements are ones in which there is very little spread about the mean value.  |
| Prediction  | A prediction is a statement suggesting what will happen in the future, based on observation, experience or a hypothesis.  |
| Hypothesis  | A proposal intended to explain certain facts or observations.  |
| Fair test  | A fair test is one in which only the independent variable has been allowed to affect the dependent variable.  |
| Resolution  | The smallest measurement possible on the instrument  |

**Homework 2 – Maths in Science 1**

Complete the questions on the maths in science homework sheet 1