The Distance Learning Centre
STUDENT ASSESSMENT SHEET

SUBJECT: Physics
UNIT TITLE: Introduction to Physics: Solving Problems in Basic Physics
LEVEL: 3 Formative Assessment (Ungraded)
CREDITS: 3

How to use this document

Please read this document carefully alongside the current Distance Learning Centre (DLC) Student Handbook and the relevant unit specification before preparing your work for assessment (see below). Remember, your tutor is looking for evidence that you have addressed the specific assessment criteria for this unit.

Please complete all of the boxes shown in pale yellow in parts 1, 2 and 3 overleaf.

This document also contains your Tutor Assessed Questions (TAQs) for this unit, as well as information about grade descriptors for Merit and Distinction, formatting your work, word counts and references, and deadlines.

Once completed, you will need to upload an electronic copy of this document and your assignment at myDLC (for marking, to be checked for plagiarism, for cross marking and for verification). Please notify your tutor by e-mail when you have uploaded this document and your assignment at myDLC.

Don’t forget to visit the DLC Library for a wide range of useful materials.

This link will lead you to the subject sets on the Ascentis Website

DLC Student Handbook
PART 1: Student declaration

Please complete all the relevant information below.

I understand that copying / taking ideas from other sources (e.g. reference books, journals, internet, and tutor hand-outs) without acknowledging them is plagiarism.

I confirm that:

- This assignment is all my own work.
- All contributions taken from other reading and research have been referenced accurately.
- Any direct quotations taken from other reading and research have been acknowledged and attributed accurately.
- I have attached a bibliography listing all sources used in producing this assignment.
- I have added the word count below. (Note: unless specified otherwise, a 10% margin above or below the required word count is acceptable.
- I have read and understood the Ascentis document entitled ‘Policies and Procedures for Dealing with Malpractice’ provided by the tutor and understand the consequences of non-compliance with this document.

Your full name: ____________________________ Your signature *:

<table>
<thead>
<tr>
<th>Date on which assessment was set:</th>
<th>Date due:</th>
<th>Date submitted:</th>
<th>Extension - date due (if applicable):</th>
</tr>
</thead>
</table>

Actual word count per TAQ: Please remember that you are only allowed to exceed (or fall short of) the word count by 10%.

* Please type your name into the signature box above and upload this document to myDLC. This will be accepted as your electronic signature.
PART 2: Assessment criteria for this unit

The following table shows the assessment criteria that your tutor will use to mark your work, and to assess whether it should receive a Pass, OR an indicative Merit or a Distinction, as this unit is a non-graded unit. When you have completed your work, please insert the page number/s on which, in your opinion, you have met each of the assessment criteria.

<table>
<thead>
<tr>
<th>ASSESSMENT CRITERIA</th>
<th>Page number/s on which you feel you have achieved the assessment criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment criteria for Pass</strong></td>
<td></td>
</tr>
<tr>
<td><strong>The student has achieved the learning outcomes because s/he can:</strong></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Describe the concepts of force, mass, velocity, acceleration impulse and momentum</td>
</tr>
<tr>
<td>2.2</td>
<td>Perform simple calculations using gas laws</td>
</tr>
</tbody>
</table>

There are some phrases which you may not be familiar with when answering assignment questions or trying to match your answers with assessment criteria. So here are some helpful tips:

**Terminology used in assessment criteria**

| To describe | | Give an account of the properties of something, its features or characteristics, or how it looks / smells so as to provide an accurate description of it. |
INDICATIVE LEARNING CONTENT:

Learners will be provided with learning opportunities in:

- concepts of force, mass, velocity, acceleration, impulse and momentum
- laws and equations of motion and understanding Newton's First and Second Laws
- Gas laws as arising from key theoretical principles in Kinetic Theory
- simple calculations using gas laws – Boyle’s Law, Charles’ Law, Ideal Gas Law
- relationships between Avogadro's principle, molecular mass and the mole
- relationships between wave velocity, frequency and wavelength (for light and sound)
- positive and negative charges, and using Coulomb’s law for force between two charges
- Electric current as rate of flow of charged particles and voltage as energy transfer per coulomb

PART 3: Your comments on this assignment

*Please provide comments (in bullet point form) about how well you feel you have done in the assignment:*

-
TAQs for this unit

Your Tutor Assessed Questions (TAQs) for this unit are shown below.

NOTE:
Although this is an ungaded unit we are going to use grade descriptors to help you understand how these work when you start on the graded units. The grade descriptors in the next section of this document are there to help you understand how to achieve a Merit or Distinction.

NOTE: IMPORTANT THIS IS A FORMATIVE ASSESSMENT

This assessment is formative, which means that it is there to make sure that you have understood the concepts needed to proceed with the rest of the assessment.

YOU WILL NEED TO UPLOAD SAQ 1 AND 2 AND HAVE THEM CHECKED BY YOUR TUTOR BEFORE PROCEEDING WITH THE REST OF THE SAQ’S.

INTRODUCTION / OBJECTIVES

This introductory unit has been developed to help you understand the Key concepts in Physics.

TAQ 1:

Assessment criterion criteria 1.1. Describe the concepts of force, mass, velocity, acceleration impulse and momentum

a) In a table similar to the one below, for each quantity insert the conventional symbol, the SI unit of measurement and the symbol for that unit, to fill in the blanks as done for the example in the first line:

<table>
<thead>
<tr>
<th>Physical Quantity</th>
<th>Conventional Symbol</th>
<th>SI Unit of Measurement</th>
<th>Unit Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>d</td>
<td>metre</td>
<td>m</td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Force</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceleration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
b) Alongside each case below state a suitable physical quantity corresponding to the units and write the number in the standard format, using an appropriate symbol and prefix, assuming trailing zeros are not significant

- 47,210 Newtons
- 56,500 Newtons per metre squared
- 2,500,000 Watts
- 0.0008 kilometres
- 756 microseconds
- twenty-five thousand volts

c) Convert the following values into the units shown and write down the results:

- 250 cm into m
- 0.036 m² into mm²
- 45 km/hr into m/s
- 75 miles/hr into m/s
- 22.5 m/s into km/hr
- 0.370 cm² into mm²
- 1.26 tonnes into kg
- 350 kg into Newtons
- 0.045 V into mV
- 1350 mA into A

WORD COUNT:
Not applicable
**TAQ 2:**

*Assessment criteria 2.2 Perform simple calculations using gas laws*

**Experiment:** You are to imagine that you have carried out an experiment to investigate the relationship between the volume and temperature of an ideal gas known as Charles’s Law.

**Equipment:** For this, you would need:
- a beaker
- a thermometer
- a ruler
- rubber bands
- a glass tube containing air trapped beneath a liquid (pictured below)
- water
- either a kettle of hot water  (beware of scalding if TOO hot!)
- or an insulated container holding ice

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![Diagram: Small bubble of acid and Volume of gas](image)

**Hazard:** The liquid used is sulphuric acid and the top of the tube is open. Take care not to spill it or break the tube.

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**Method (already employed):**

Throughout the experiment we are interested in the gas at the bottom of the tube. The liquid above it is there only to keep the gas trapped in place, and so that we can see where the top of the gas is and hence the length of the gas column.

The tube containing the gas should be strapped to the ruler using the rubber bands so that you can use the marks on the ruler to measure the length of the gas trapped at the bottom. Since the cross sectional area of the cylinder does not change significantly throughout the experiment, the volume is proportional to the length.

Place the ruler and tube into the beaker, along with the thermometer and put in some water. Record the temperature and length of your gas bubble in the first line of a table like the one below. We shall repeat these readings for up to 10 different temperatures. Heat the water by
adding water from the kettle. Stir the water and record the new temperature and the new length of the bubble.

<table>
<thead>
<tr>
<th>Temp / degrees C</th>
<th>Length of bubble/ mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>124</td>
</tr>
<tr>
<td>30</td>
<td>133</td>
</tr>
<tr>
<td>50</td>
<td>142</td>
</tr>
<tr>
<td>70</td>
<td>150</td>
</tr>
<tr>
<td>90</td>
<td>159</td>
</tr>
</tbody>
</table>

Suppose you have found the results above. Plot them on a graph (Using graph paper) with temperature on the x-axis and length on the y-axis and write about the following points. What does your graph tell you about the relationship between the temperature and volume of the gas in your tube?

- If the gas was cooled enough, at absolute zero of temperature it would have zero volume. Calculate a value for the absolute zero of temperature from your graph.
- Look up a value for absolute zero temperature. (you will be able to find this on any web browser) Compare this with the value you found in your experiment.
- Summarise your conclusions from the experiment in relation to Charles’s Law (and anything else you think relevant).

**WORD COUNT:**

200 words
This unit is ungraded which means that the highest grade you can achieve is a pass. However, as the unit is ungraded it also gives you a chance to find out what you would need to do to gain a merit or distinction grade. We have therefore identified some grade descriptors which could have been used if the assessment had been graded and your tutor will give you feedback on these grades when they mark your work.

**Grade descriptors for Merit and Distinction**

The grade descriptors for this unit are as follows:

### QAA Grade descriptor 1: Understanding the subject

<table>
<thead>
<tr>
<th>Indicative content for Merit</th>
<th>Indicative content for Distinction</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student's work is demonstrates a very good grasp of the relevant knowledge base and is generally informed by the major conventions and practices of the area of study.</td>
<td>The student's work demonstrates an excellent grasp of the relevant knowledge base and is consistently informed by the major conventions and practices of the area of study.</td>
</tr>
</tbody>
</table>

**Extra help and pointers** (this help is not exhaustive):

You need to show that you have understood the subject matter you have used in your assessment very well. Make sure that you write your assessments in the third person unless you have been asked for your own thoughts on the subject and that you reference using the Harvard referencing system. For a Merit, there may be some inconsistencies in your referencing, though these should be few. Pay attention to the assessment criteria and use evaluation where required to a very good level.

You need to show that you have an excellent understanding of the subject matter you have used in your assessment. Make sure that you write your assessments in the third person unless you have been asked for your own thoughts on the subject and that you reference using the Harvard referencing system. For a Distinction there should be no inconsistencies in your referencing. Pay attention to the assessment criteria, especially when evaluation of the theories is asked for. Evaluation should be up to date, comprehensive and concise, using multiple points of evaluation.

### QAA Grade descriptor 2: Application of knowledge

<table>
<thead>
<tr>
<th>Indicative content for Merit</th>
<th>Indicative content for Distinction</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student's work makes use of relevant:</td>
<td>The student's work makes use of relevant:</td>
</tr>
<tr>
<td>• ideas</td>
<td>• Ideas</td>
</tr>
<tr>
<td>• facts</td>
<td>• facts</td>
</tr>
<tr>
<td>• theories</td>
<td>• theories</td>
</tr>
<tr>
<td>• perspectives</td>
<td>• perspectives</td>
</tr>
<tr>
<td>• concepts</td>
<td>• concepts</td>
</tr>
<tr>
<td>with either breadth or depth that goes beyond the minimum required for a Pass.</td>
<td>with both breadth and depth.</td>
</tr>
</tbody>
</table>

**Extra help and pointers** (this help is not exhaustive):

For this grade descriptor you need to know how to apply your knowledge and the research you have done. You need to be...
mindful of the word count for each of the TAQ’s and keep to the rule of 10% either way. The work should show that you are able to cover the criterion in your own words and at the correct breadth or depth for the subject.

<table>
<thead>
<tr>
<th>QAA Grade descriptor 3: Application of skills</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicative content for Merit</strong></td>
</tr>
<tr>
<td>The student's work <strong>generally</strong> selects appropriate, skills, techniques and methods and applies appropriate skills, techniques and methods with <strong>very good</strong> levels of confidence, consistency, precision and accuracy.</td>
</tr>
<tr>
<td><strong>Indicative content for Distinction</strong></td>
</tr>
<tr>
<td>The student's work <strong>consistently</strong> selects appropriate skills, techniques and methods and applies appropriate skills, techniques and methods <strong>excellent</strong> levels of confidence, consistency, precision, and accuracy.</td>
</tr>
</tbody>
</table>

**Extra help and pointers** (this help is not exhaustive):

The correct techniques are identified and used **most of the time**, showing **very good** confidence and flair. The work is **mainly consistent**, with only a few ambiguities, and **strives for** precision and accuracy in the execution of the assessment criteria.

The correct techniques are identified and used **all of the time**, showing an **excellent** level of confidence and flair. The work is **consistent**, with only very minor ambiguities, and **achieves** precision and accuracy in the execution of the assessment criteria.

<table>
<thead>
<tr>
<th>QAA Grade descriptor 4: Use of information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicative content for Merit</strong></td>
</tr>
<tr>
<td>The student's work identifies new information from sources which are <strong>generally</strong> appropriate, and <strong>generally</strong> appraises the relevance and value of new information accurately.</td>
</tr>
<tr>
<td><strong>Indicative content for Distinction</strong></td>
</tr>
<tr>
<td>The student's work identifies new information from sources which are <strong>consistently</strong> appropriate, and <strong>consistently</strong> appraises the relevance and value of new information accurately.</td>
</tr>
</tbody>
</table>

**Extra help and pointers** (this help is not exhaustive):

This is where you show how you have used all the research you have found, making sure that you only use information that is relevant, up to date, reliable and valid. You will show that you are able to use your understanding of the subject to advance your arguments and ideas to a **very good** standard.

This is where you show how you have used all the research you have found, making sure that you only use information that is relevant, up to date, reliable, and valid. You will show that you are able to use your understanding of the subject to advance your arguments and ideas to an **excellent** standard, taking into account the assessment criteria and the other grade descriptors used in the assessment.

<table>
<thead>
<tr>
<th>QAA Grade descriptor 7: Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicative content for Merit</strong></td>
</tr>
<tr>
<td>The student's work is structured in a way that is <strong>generally</strong> logical and fluent.</td>
</tr>
<tr>
<td><strong>Indicative content for Distinction</strong></td>
</tr>
<tr>
<td>The student's work is structured in a way that is <strong>consistently</strong> logical and fluent</td>
</tr>
</tbody>
</table>

Taken as a whole, demonstrates a **very good** response to the demands of the

Taken as a whole, demonstrates an **excellent** response to the demands of the
This grade descriptor looks at the overall quality of your work. Is it set out properly? Have you numbered the pages? Have you put your work in the right sort of folder? Does the work read well and uses the appropriate language and terminology? This grade descriptor looks at the quality of the work as a whole.

**Extra help and pointers** (this help is not exhaustive):

**Formatting your assignment, word counts and references**

**a) Formatting your assignment**

When you are submitting assignment for assessment, please put your full name in the document header of every page, along with the title of the unit as shown on the front page of your learning materials. Please put the page number of each page in the footer. Unless a hand drawn diagram is asked for, please **present all of your work in word processed form.** If the work is handwritten material (for example hand drawn diagrams), please take a copy for your own records before sending the original to your tutor, so that if any of your work gets lost in the post you will have a copy.

**b) Word counts**

Please include a word count for each Tutor Assessment Question (TAQ) at the end of the TAQ. A target word count for each TAQ is provided above. The overall word count for a 6 credit unit is 2000-2500 words and for a three credit unit 1000-1500.

**Why do we have a word count?**

The purpose of the word count is to ensure that the assessment across all units within every Access to HE Diploma is standardised and equal. Writing to a word count is a skill which will be required at University and in many professions. The addition of the word count gives students a guide as to the amount of work that is expected, the level of detail that is required and the amount time that should be spent on each assignment.

**What is included in the word count?**

The word count takes into account everything in the main body of text. This includes quotations, citations, headings and tables. However, the word count does not include the title, footnotes, any appendices, reference list or bibliography. You must remain within the word count range.”

However, if the assessment contains a table or a diagram that you have been asked to complete, the words that are already in the table or diagram are not counted in the word count.

If your work does not fit within the word count it will be returned to you by your tutor before it is marked for you to either make additions or for you to reduce the words.

**c) References**

A good approach when it comes to referencing is to always reference and to do so after each TAQ. Your references should follow the Harvard system, and Anglia Ruskin University produce a useful guide to the Harvard system of referencing (see below). **Any TAQ with a word count of less than 200 words does not need to be referenced.**
Subject: Physics
Unit title: Introduction to Physics Formative assessment

Student Assessment Sheet

There are also websites that will generate a Harvard reference for you and it is a good idea to get into the habit of referencing, as this is a skill which will be required throughout your studies.

Anglia Ruskin University - Guide to the Harvard System of Referencing

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Deadlines

a) If you are completing your course in 12 months:

Your deadline for this assignment is one week on a 12 month programme.

b) If you are completing your course in less than (or more than) 12 months:

Please refer to the table below to help you negotiate your deadlines with your tutor if you are not expecting to complete your course in 12 months.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>12 months</th>
<th>10 months</th>
<th>8 months</th>
<th>6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>Just over 1 Credit per week (1.15)</td>
<td>Just under 1 ½ Credits per week (1.38)</td>
<td>Just under 2 Credits per week (1.73)</td>
<td>Just over 3 Credits per week (2.31)</td>
</tr>
</tbody>
</table>

You must inform your tutor of your target completion date if you are aiming to complete your course in less or more than 12 months.

c) If you need an extension to a deadline:

If you are unable to meet your deadline you must apply for a formal extension to a unit assessment deadline. This must be done on the working day (excluding weekends) before a unit is due to be assessed, at the very latest. To do this, you must contact your tutor by email requesting a formal extension for a unit assessment, and giving the reasons for the extension.

d) If you have been unable to request an extension or to meet a deadline:

If you do not ask for an extension because exceptional circumstances (such as serious illness or bereavement) have made it difficult to do so, you must complete and submit an Extenuating Circumstances form, which is available to download in MS Word format from the Policies and Procedures page of the DLC website (see below).

If you do not submit an Extenuating Circumstances form, you will only be able to attain an overall pass grade for the unit assessment.

DLC Extenuating Circumstances form (scroll down the page to download the form)