SAIP Teacher's Module

1 Note to the Teacher.

This, and the other modules in this series, is not intended to show you how to teach a specific topic in the new CAPS document. What it is intended to do, is to help you get a better understanding of physics in general. You will find that the methods used for the chosen topic in this module can be applied to a wide variety of topics within CAPS, and any future changes to the curriculum, and it will empower you tackle them with confidence, because you have a broader, and better, understanding of physics.

Each module can be seen as a "stand-alone" unit, but it is possible that one module may be followed by another that is either a:

- continuation of a particular topic, or
- related topic.

Each module consists of some theory, which is integrated with practical work and discussions. There will be an emphasis, not only on doing a practical, but also on collecting data, recording and displaying it and then interpreting and analysing it by plotting graphs and/or doing some simple statistical analysis.

As you work your way through the module you will see that there are Glossary Boxes that contain an explanation/definition of new words and where a practical is being suggested there will be a Needs Box, explaining what apparatus will be needed to do the experiment. In all the experimental/practical work, the emphasis will be on using available materials and on improvising when certain items are not readily available.

It is important that whenever the opportunity arises that you discuss what you are doing with others, question each other and the tutor who is facilitating the module. Also remember that something that is obvious to you, may not be obvious to someone else, and vice versa, which really means that there are really no "stupid questions"! If you don't understand something, or you are not sure about some aspect of the work, ask!

At the end of each module there are a variety of self-assessment questions and problems ranging from:

- an **extension** – a simple application of the work covered,
- **enrichment** – applying some of the work covered in this module and manipulating it, and
- a **challenge** – more difficult work that might need some lateral or innovative thinking and the use of additional material or practicals/activities.

To see if you have achieved the learning goals for this Unit you should try and answer as many of the problems given at the end using the following steps:

- attempt the problems by yourself, starting with those under **Extensions**. Use the Module material and worked examples as a guide,
- try to avoid using the guidelines to the solutions and don't try to answer the **Enrichment** and **Challenging** problems until you are familiar with the material,
- if you have difficulties then consult the guidelines to the solutions,
- if you still have difficulties in solving one or more problems then consult your tutor/facilitator.

Each module will also have a **Study Outline** to help you plan your activities and work, by giving you a fairly detailed list of material covered, theory, practical and self-assessment exercises with some suggested solutions and answers. This will also give you an idea of the time allocated to each part of the module.

These modules will enable you to:

- get a better understanding of the physics content through a different and stimulating learning experience that will hopefully inculcate an appreciation of physics,
- gain skills in practical work, giving you the ability to repeat them in your classes or use them as demonstrations with confidence,
- learn how to record, display, analyse and interpret collected data,
- become familiar with handling simple apparatus and how to improvise when what you want is not readily available,
- develop an innovative, non-algorithmic and realistic approach to problem solving,
- appreciate that teaching is really about sharing knowledge!

Remember that this Module is not the only material you should be using, there are a number of other resources available, including your colleagues, the Internet*, in addition to many excellent books and some are listed in the **Further Reading** section below.

* See module on ***Using the Internet***.

Acknowledgements

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Fujrther Reading

For additional reading, the following textbooks are recommend:

- "*Physics*" by D.C. Giancoli, 5th Edition.
- "*Conceptual Physics*" by P.G. Hewitt, 8th Edition.
- "*Contemporary College Physics*", by E.R. Jones and R.L. Childers.
- "*Physics for Scientists and Engineers*" by R.A. Serway, 5th Edition.
- "*Introductory College of Physics*" by J.F. Mulligan.
- "*College Physics*" by R.A. Serway and J.S. Faughn, 5th Edition.
- "*Fundamentals of Physics"* by Haliday and Resnick.
- *"Physics for the Inquiring Mind"* by Eric Rogers
- *"Physics"* by Cutnell and Johnson, 6th Edition
- *"Physics1"* and *"Physics 2"* Cambridge Advanced Series. Ed. David Sang
- *"A-Level Physics"* by Roger Muncaster, 4th Edition.

But these are not the only ones – there are many others – ask your Tutor if you are not sure whether or not a text you have is suitable.