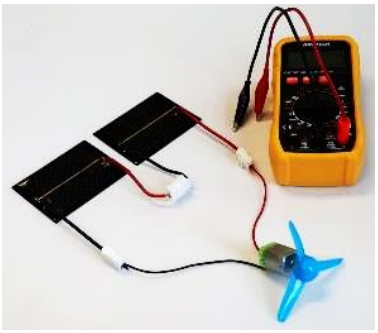
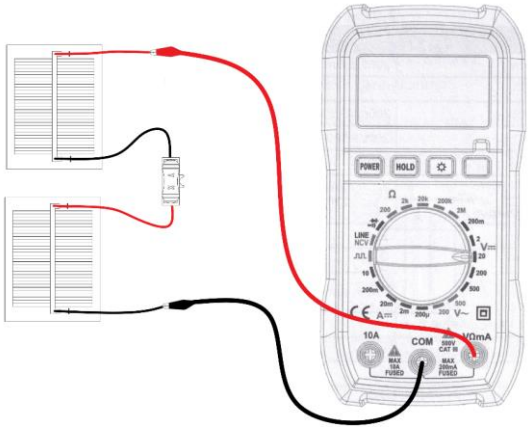
INTRODUCING SOLAR ENERGY
(Code: SOLARINTRO)

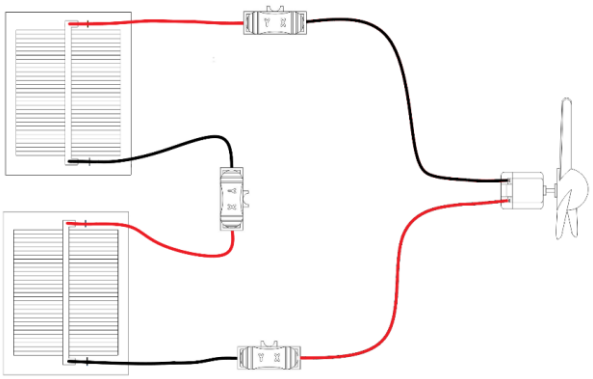
DESCRIPTION

The *INTRODUCING SOLAR ENERGY* kit allows students to investigate the operation and properties of solar cells, and see how electricity is generated by them. By using the supplied components together with a multimeter, students can experiment with Series and Parallel circuits, and carry out simple experiments with sound and motion.



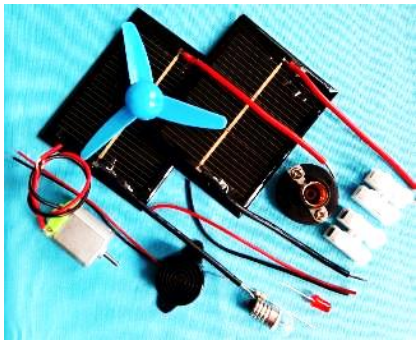
LEVEL:	Introductory
SKILL DEVELOPMENT:	• Electrical knowledge of terminology, symbols and circuit types • Investigating electricity generation by solar panels, including Voltage and Current • Alternative Energy





WHAT'S IN THE KIT?

- ☐ All the mechanical and electrical components required to introduce and experiment with Solar energy, including two solar panels, a motor and buzzer.
- ☐ A detailed teaching unit with a complete parts list, with information on circuits and symbols, a Glossary and experiments to carry out.



WHAT ELSE IS NEEDED?

The following items are required and are available from Scorpio Technology, but need to be ordered separately:

- ☐ A Digital Multimeter with 20 volt and 10 Amp ranges (MULTIM1527) or Voltmeters and Ammeters.

If using a multimeter with Test probes, please note that the Push connector will not hold the test probe, in which case the following are suggested:

- ☐ Leads with Banana plugs at both ends (BAPLW2) used with Alligator clips to suit (ALLICLIPPS) – or make your own leads with banana plugs and alligator clips

TOOLS REQUIRED

The following tools are required. Several are available from Scorpio Technology, and can be ordered separately if required (item codes in brackets):

REQUIRED TOOLS	ORDERING CODE
Hammer	HAMMERCP/HAMMERCL
Phillips head (cross head) screwdriver #1 point	SCREWDRPH1/80

GENERAL OBJECTIVES

Students are to experiment with solar panels and a variety of components, and carry out electrical testing.

OBJECTIVES

As a result of these Solar Cell activities, the students will be able to:

- ☐ Understand that Solar Cells convert Light Energy into Electrical Energy.
- ☐ Understand the role of the Solar Cell as an energy source in a circuit.
- ☐ Construct Series and Parallel circuits and understand the type of energy conversions that take place.
- ☐ Identify the differences between a Parallel circuit and a Series circuit.
- ☐ Identify the various components used in their experiments and explain what their function is.
- ☐ Define and use vocabulary associated with Solar Cells and electricity.
- ☐ To be aware of the safety aspects of electricity.
- ☐ Predict, observe and explain what they have seen during experimentation.

ACTIVITIES

The Solar Cell activities include:

- ☐ Familiarisation with Electrical circuit Symbols
- ☐ Simple electricity experiments using solar cells:
    - Testing the solar cell's output
    - Measuring voltage with Solar cells in series and parallel
    - Measuring current with Solar cells in series and parallel
- ☐ Using solar cells to power other devices:
    - Powering a globe - – solar cells in series and parallel

- Powering a motor - – solar cells in series and parallel
- Powering a buzzer - – solar cells in series and parallel
- Powering a light emitting diode (led) – series only

☐ Glossary

DOES THE TEACHING UNIT INCLUDE ANY THEORY?

The Teaching unit has a THEORY section that covers

- Electrical safety
- Sunlight Angle and it's Effect on Electricity generation
- Solar Cells in Series
- Solar Cells in Parallel
- Solar Panels
- Solar Cells

In this unit students will be introduced to the following theory through experimentation:

- Solar Cells convert light energy into electrical energy.
- Solar Cells can be connected in series to increase voltage.
- Solar Cells can be connected in parallel to increase current.
- Electricity is a form of energy.
- Electric energy can be converted to other forms of energy such as light energy, sound energy or kinetic energy.
- Electric currents only flow when a circuit is complete.
- Electric energy can be stored in batteries.