

## MODULE OVERVIEW

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| <b>Module Title:</b>         | <b>PHYSICAL SCIENCE</b>   |
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| <b>Rationale:</b>            | <p>Identifying and implementing effective teaching and learning strategies is often difficult in areas of science where teachers feel they lack adequate content knowledge. The topic of Electricity often presents these difficulties for some primary teachers.</p> <p>This module aims to build primary teachers' confidence in teaching electricity through a problem solving approach. The module incorporates the use of children's ideas about electricity and highlights the important role of exploration in learning.</p>     |
| <b>Summary of Outcomes:</b>  | <ul style="list-style-type: none"><li>• Participants consider their individual beliefs about learning and how these may be linked to classroom actions, roles and teaching strategies in primary science.</li><li>• Participants consider the implications of translating scientific ideas into "teachable" content for primary students.</li><li>• Participants consider the implications of alternative perspectives in the primary classroom and the implications these have for teaching and learning in primary science.</li></ul> |
| <b>Content Vehicle:</b>      | <p>Electricity: <i>Design, build and describe the operation of simple devices that transfer or transform energy.</i> (Level 4, substrand: Energy and its uses)</p>  |
| <b>Level:</b>                | Primary   |
| <b>Big Ideas:</b>            | <ul style="list-style-type: none"><li>• Nature of Science.</li><li>• Conceptual Change.</li><li>• Teacher Behaviours.</li><li>• Sources of Student Engagement.</li></ul>  |
| <b>Source of Engagement:</b> | <p>This module begins with the examination of student work samples, related to an initial engagement activity to promote an interchange of participants' ideas re children's learning and teacher planning. These activities facilitate concept attainment followed by the application of the concept in a problem-solving scenario.</p>  |
| <b>Teaching Procedures:</b>  | <ul style="list-style-type: none"><li>• Think pair share.</li><li>• Work out what you need to find out.</li><li>• Exploring materials.</li><li>• Using exemplars to clarify circuit characteristics.</li><li>• POE.</li><li>• Technology- problem solving context.</li></ul>  |

## MODULE OVERVIEW

**Implications for Practice:**

- Sources of student engagement.
- Ascertaining alternative perspectives.
- Fostering students' conceptual change.
- Sharing intellectual control.
- Promoting effective classroom interaction.

**Links to Other Modules:**

- Science Teaching and Learning.
- Natural and Processed Materials.
- Teaching and Learning in Science.

**Links with CSF II:**

- Direct content link with level 4 substrand Energy and its uses. The work in this module can also support consolidation of level 3 in the same substrand. Teaching procedures can be used across CSF levels 2-4.

**Basic Theory:****Specific to science content****Teachers:**

- Electric current is a flow of electric charges, usually electrons.
- A conductor is a material that contains very mobile electric charges.
- Batteries act as a pump and cause electric charge to move.
- The path from a source of power, *eg.* a battery, through wires, globes, switches, *etc.*, back to the source of power (battery) is called a circuit.
- An electrical circuit to light a globe can be made using a globe, battery, copper wires.
- For electrical charges to move in a circuit there must be:
  - a power source (such as a battery)
  - a substance through which the electrical charges can move easily (a conducting material)
  - a circuit or path that the electricity can travel along.
- A *closed* circuit is one where there are no breaks or spaces and the current will flow around the circuit.
- An *open* circuit is one where there is any break that does not allow the current to flow through the circuit.
- A circuit can be open/closed by using a switch.

**Basic Theory:****Specific to science content****Students:**

- Electric current is a flow of electricity
- Some materials allow electricity to move easily through them. These materials are called conductors.
- Batteries are a portable source of energy, they act as a pump and

**MODULE OVERVIEW**

cause electricity to flow.

- The path from a battery, through wires, globes, switches, etc., back to the battery is called a circuit.
- An electrical circuit to light a globe can be made using a globe, battery, connecting wires.
- For electricity to move in a circuit there must be:
  - a power source (such as a battery)
  - a substance through which the electricity can move easily (a conducting material)
  - a circuit or path that the electricity can travel around.
- A circuit can be broken/completed by using a switch.