



**SCOTLAND
LIGHTS UP
MALAWI**

Scotland Lights up Malawi

Third level adventure – energy

Introduction

This learning journey explores Energy in the context of the Scotland Lights up Malawi Project. Through investigation learners will gain an understanding of both renewable and non-renewable energy sources and be able to express opinions on the implications of the use of these energy sources in both Scotland and the global community.

Prior learning

Sciences – learners should:

- By considering examples where energy is conserved I can identify the energy sources and how it is transferred and ways of reducing wasted energy. **SCN 2-04a**
- Through exploring non-renewable energy sources, I can describe how they are used in Scotland today and express an informed view on the implications for their future use. **SCN 2-04b**
- I have used a range of electrical components to help to make a variety of circuits for differing purposes. I can represent my circuit using symbols and describe the transfer of energy around the circuit. **SCN 2-09a**

Technologies – learners should:

- I can investigate the use and development of renewable and sustainable energy to gain an awareness of their growing importance in Scotland or beyond.

Experiences and outcomes

Sciences

- By investigating renewable energy resources and taking part in practical activities to harness them I can discuss their benefits and potential problems. **SCN3-04b**
- Through research and discussion, I have contributed to evaluations of media items with regard to scientific content and ethical implications. **SCN 3-20b**

Technologies

- From my studies of sustainable development, I can reflect on the implications and ethical issues arising from technological developments for individuals and societies. **TCH 3-02a**

Stimulus

The topic can be introduced using the story of SolarAid in Malawi.

<http://www.keepsotlandbeautiful.org/malawi-resources> Here there are good introductory units in 2, 4 & 5 to Energy at Second Level.

Here there are lots of case studies and PowerPoint presentations to use as an introduction to topical science issues.

Skills

Through research activities and practical investigations learners will develop skills in:

- **Inquiry and investigation.**
- **Observation and making predictions.**
- **Analytical thinking** – relating to success/ failure in group or individual tasks.
- **Interpretation and evaluation** of information – when making sense of results.
- **Draw valid conclusion, presenting and justifying** opinions.
- **Planning and organising** through the challenges.

For more info on skills visit: [Building the Curriculum 4](#) and **Sciences Principles and Practice at**

<http://www.educationscotland.gov.uk/sciences>

Suggested key learning

Learning intentions and success criteria should be established through dialogue with learners.

Learners can:

- Investigate different renewable energy sources.
- Explain the benefits of renewable energy.
- Identify potential problems with renewable energy sources.
- Research one non-renewable energy source and express an informed view on the implications of its use in the future.
- Understand and express an informed view on the growing importance of renewable and sustainable energy in Scotland and the rest of the world.
- Research, analyse, interpret and present information to explain, support or develop an issue reported in the media.
- Topical Science- analyse a current topical science story relating to energy and present information to peers using multimedia tools.

Suggested learning activities

- Research different renewable energy sources explaining the benefits of renewable energy.
- Interpret and evaluate research information to identify potential problems with renewable energy sources.
- Identify the five sources of renewable energy and explore their use in Scotland and Malawi. (Sunny Schools Pack Unit 4 and 5)
- Watch advantages/disadvantages of renewable energy clips and express an informed opinion on the issues surrounding renewable energy. Present and justify opinion to class.
<http://www.childrensuniversitymanchester.ac.uk/interactives/science/energy/renewable/>
- Topical Science- analyse a current topical science story relating to energy and present information to peers using multimedia tools.
- Investigate other uses for solar energy
Solar cooking
[.http://www.sserc.org.uk/index.php/physics-home/cfe3-4/3355-sustainability-as-a-context-for-teaching-aspects-of-heat-transfer-and-energy](http://www.sserc.org.uk/index.php/physics-home/cfe3-4/3355-sustainability-as-a-context-for-teaching-aspects-of-heat-transfer-and-energy)

Reflecting on learning

Use the following pointers to discuss with your children what they have learned.

Breadth

Can you talk about what you have learnt and which curricular areas have been explored? Can you apply what you have learnt to real life and /or school life?

Personalisation and choice

Did you choose how you carried out investigation and recording of information?

Depth

Have you shown and explained what you have learnt to others? Did you lead learning for others in any way?

Coherence

Are you able to discuss the knowledge, understanding and skills you have developed and explain how you have used these? Can you relate these to other curricular areas and /or to real life?

Progression

Did you already have any skills or knowledge of the subject and have you been able to develop these?

Relevance

Are you able to identify a real life opportunity to use your knowledge, understanding and skills?

Challenge & enjoyment

Can you talk about whether or not you have enjoyed the learning and explain your reasons? Did you find the learning challenging, and can you suggest ways

Evidence of learning

Possible methods of assessment are listed below. Select as appropriate or devise your own.

Say: Verbally explain results of investigation into renewable energy sources. Make links learning experiences to real-life situations.

Write: Write a simple, coherent explanation of the advantages of renewable energy.

Make: Complete a design challenge related to creating a circuit. Select appropriate equipment. Through a 'predict, observe and explain' sequence explain and discuss the various factors involved in the investigations and challenges and give possible explanations for their findings.

Do: Present information on a renewable energy source expressing an informed view on its importance in Scotland and the rest of the world.

*For more information see **Assessing progress and achievement resource** at <http://www.educationscotland.gov.uk/sciences>*

Taking learning further

Find ways to deepen and extend learning through dialogue with learners.

Suggestions to challenge learners:

- Having carried out an investigation explain the formation and use of fossil fuels and finite resources.
- Critically analyse scientific themes of topical interest and use information to develop an informed argument
- Investigate other solar energy activities/renewable energy sources. Solar buggies - <http://www.schoolslab.com/alternative-energy-sources/solar-buggy> Wind turbines - <http://www.timstar.co.uk/wind-turbine-kit-7531.html>