



Scotland Lights up Malawi

Second 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:

- Be able to identify different types of energy.
SCN 1-04a
- Understand the importance of energy in their everyday lives.
SCN1-04a
- Describe an electrical circuit as a continuous loop of conducting material.
SCN 1-09a
Be able to combine simple components in a series circuit to make a model or a game.
SCN 1-09a

Technologies – learners should:

- Be aware of how to conserve materials and resources and be able to consider the impact of their actions on the environment.
TCH 1-02a

Experiences and outcomes

Sciences

- By considering examples where energy is conserved, I can identify the energy source, 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

- I can investigate the use and development of renewable and sustainable energy to gain an awareness of their growing importance in Scotland or beyond.
TCH 2-02b

Stimulus

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

<http://www.keepsotlandbeautiful.org/malawi-resources>

In Units 2, 4 & 5 the focus is on Energy at Second Level/Third Level.

There are also 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:

- Identify different energy sources.
- Explain how energy is transferred.
- Identify ways of reducing energy waste.
- Research non-renewable energy sources.
- Express an informed view on the implications of non-renewables in the future.
- Create an electric circuit.
- Draw a diagram to represent an electric circuit using appropriate symbols.
- Describe the transfer of energy around a circuit.
- Investigate the use of renewable and sustainable energy.
- Understand and express an informed view on the growing importance of renewable and sustainable energy in Scotland and the rest of the world.
- Interpret and present information to explain, support or develop an issue reported in the media

Suggested learning activities

- Identify different non renewable energy sources doing practical activities to gain an understanding of how energy is transferred. (The Energy Journey- Sunny Schools pack Unit 2) <http://www.keepsotlandbeautiful.org/malawi-resources>
- Keep an energy diary at home for a week noting everything that requires energy. Evaluate results with class to identify actions and behaviour changes necessary to reduce energy waste within the home. (See Sunny Schools Activity sheets 3,4a and 4b)
- 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.childrensuniversity.manchester.ac.uk/interactives/science/energy/renewable/>
- Create a circuit. <https://www.tes.co.uk/teaching-resource/Making-a-circuit-3002538/>
- Design more complex electrical circuits and predict if circuits will successfully conduct electricity. <http://www.bbc.co.uk/education/topics/zqccwmn>
http://www.bbc.co.uk/bitesize/secondlevel/sciences/forces/electrical_circuits/play/
- Topical Science- analyse a current topical science story relating to energy and present information to peers using multimedia tools. <http://www.bbc.co.uk/newsround/>

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 to achieve your next learning goals?

Evidence of learning

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

Say: Explain how energy is transferred and suggest ways of reducing energy. Describe how non-renewable energy sources are used in Scotland at present and express an informed opinion on this use. Participate in a class debate on the advantages /disadvantages of using renewable and non-renewable energy sources.

Write: Write a simple, coherent explanation of how a circuit works. Write a persuasive text in preferred genre expressing viewpoint on renewable energy use within Scotland or Malawi. Write a poster demonstrating knowledge of advantages of renewable energy sources in Scotland and Malawi. Compose a song or a rap about use of energy sources.

Make: Design and create a PowerPoint explaining the use of non-renewable energy sources in Scotland reflecting on their future use. Create electrical circuits using a range of components then draw this circuit using the correct symbols.

Do: Create a display of knowledge in your class and invite parents in to share your knowledge of energy through pupil led workshops. Design and carry out a survey on energy use within the school and work with the Eco Committee to create an energy saving campaign within the local community.

*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:

- Look at the ethical implications of non-renewable energy sources.
- Analyse in more detail the disproportionate use of energy sources across the world and the impact that this use has on people's daily lives across the globe.

*See the **Sciences Concept Development Paper** for more guidance: <http://www.educationscotland.gov.uk/sciences>*