

Eco-Schools Curricular Maps - Energy Topic

The series of 'Outcome Maps' in this document suggest how Curriculum for Excellence (CfE) Experiences and Outcomes may be delivered through the Eco-Schools Energy Topic

Eco-Schools Scotland commissioned experienced teachers to select outcomes they felt appropriate for each topic.

Please note:

- The selected outcomes for each Map are advisory – teachers may reject or add outcomes which they consider more appropriate to the context in which they plan to teach.
- Eco-Schools 'Outcome Maps' are for guidance purposes only, are not exhaustive and should not be viewed as limiting.
- The first map illustrates how closely the Seven Elements of the Eco-Schools Programme match core outcomes from CfE
- Each subsequent topic map is accompanied by a header which suggests possible 'lead curricular areas'. Again these are open to debate and amendment by teachers.
- While similar in format not all Maps are identical – topics such as Health and Wellbeing are so closely related to Eco-Schools topics that almost all outcomes are relevant.
- Each outcome is normally quoted in full along with its relevant CfE code.
- Following piloting with teachers we have added a commentary in italics to some outcomes to explain their inclusion within an outcome map or suggest a possible teaching context. Linking 'arrows' on some topic maps highlight the opportunities for interdisciplinary learning across curricular areas.



Energy Topic: Early Level

Technologies (Technological developments in society and business)

I enjoy playing with and exploring technologies to discover what they can do and how they can help us.

TCH 0-05a *What types of energy do technologies use?*

To help care for the environment, I reduce, re-use and recycle the resources I use. **TCH 0-06a** *To reduce energy use in the class and at home*

Science (Planet Earth)

I have experienced, used and described a wide range of toys and common appliances. I can say 'what makes it go' and say what they do when they work. **SCN 0-04a** *The energy from batteries is changed to give sound, movement, light or heat*

Science (Forces, electricity and waves)

I know how to stay safe when using electricity. I have helped to make a display to show the importance of electricity in our daily lives. **SCN 0-09a** *Electricity is a type of energy*

Health and Wellbeing (Mental, emotional, social and physical wellbeing)

Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community. **HWB 0-13a** *Saving energy- taking message home*

Literacy (Listening and Talking)

I listen or watch for useful or interesting information and I use this to make choices or learn new things. **LIT 0-04a**

As I listen and take part in conversations and discussions, I discover new words and phrases which I use to help me express my ideas, thoughts and feelings. **LIT 0-10a**

Numeracy and Mathematics (Information handling)

I can collect objects and ask questions to gather information, organising and displaying my findings in different ways. **MNU 0-20a** *Sort appliances for different energy use .Draw. Which use more energy-why*

I can match objects, and sort using my own and others' criteria, sharing my ideas with others. **MNU 0-20b** *As above. How can we save energy ?*



Energy Topic: First Level

Technologies (Technological developments in society and business)

I can take appropriate action to ensure conservation of materials and resources, considering the impact of my actions on the environment. **TCH 1-06a** *The use of materials and resources requires energy*

I understand how technologies help provide for our needs and wants, and how they can affect the environment in which we live. **TCH 1-07a** *This is dependent on energy. Consider energy saving actions.*

Science (Planet Earth)

I am aware of different types of energy around me and can show their importance to everyday life and my survival. **SCN 1-04a**

Science (Forces, electricity and waves)

I can describe an electrical circuit as a continuous loop of conducting materials. I can combine simple components in a series circuit to make a game or model. **SCN 1-09a**

Health and Wellbeing (Mental, emotional, social and physical wellbeing)

Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community. **HWB 1-13a** *Membership of Eco Committee, energy monitors, home-school links*

Literacy (Listening and talking)

I can communicate clearly when engaging with others within and beyond my place of learning, using selected resources as required. **LIT 1-10a**

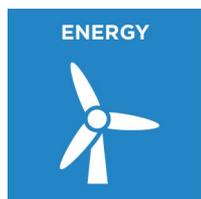
Numeracy and Mathematics (Information handling)

I have used a range of ways to collect information and can sort it in a logical, organised and imaginative way using my own and others' criteria. **MNU 1-20**

Using technology and other methods, I can display data simply, clearly and accurately by creating tables, charts and diagrams, using simple labeling and scale. **MTH 1-21a** *Pictographs of energy use*

Expressive Arts (Music)

Inspired by a range of stimuli, and working on my own and/or with others, I can express and communicate my ideas, thoughts and feelings through musical activities. **EXA 1-18a** *Convey different types of energy/appliances/toys through different musical instruments/rhythms/sounds*



Energy Topic: Second Level

Sciences (Planet Earth)

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](#)

Sciences (Forces, electricity and waves)

I have collaborated in investigations to compare magnetic, electrostatic and gravitational forces and have explored their practical applications. [SCN 2-08a](#)

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](#)

To begin to understand how batteries work, I can help to build simple chemical cells using readily-available materials which can be used to make an appliance work. [SCN 2-10a](#)

Sciences (Topical Science)

I can report and comment on current scientific news items to develop my knowledge and understanding of topical science. [SCN 2-20b](#)

Technologies (Technological developments in society and business)

I can analyse how lifestyles can impact on the environment and Earth's resources and can make suggestions about how to live in a more sustainable way. [TCH 2-06a](#) *Investigate zero waste lifestyles*

I can make suggestions as to how individuals and organisations may use technologies to support sustainability and reduce the impact on our environment. [TCH 2-07a](#)

Social studies (People, past events and societies)

I can compare and contrast a society in the past with my own and contribute to a discussion of the similarities and differences. [SOC 2-04a](#) *Investigate energy sources and energy uses*

I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally-responsible way. [SOC 2-08a](#)

I can use evidence selectively to research current social, political or economic issues. [SOC 2-15a](#) *Research the dependence on fossil fuels*

Health and Wellbeing (Mental, emotional, social and physical wellbeing)

Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community. [HWB 2-13a](#) *Pupils can become involved in monitoring energy used e.g. 'Energy monitors' check that lights and computers have been switched off when not in use.*

Numeracy and Mathematics (Information handling)

I have carried out investigations and surveys, devising and using a variety of methods to gather information and have worked with others to collate, organise and communicate the results in an appropriate way. [MNU 2-20b](#) *Collecting information on units of energy used and saved, taking meter readings etc*

I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology. [MTH 2-21a](#) *Graphing energy readings using computers*



Energy Topic: Third Level

Sciences (Planet Earth)

I can use my knowledge of the different ways in which heat is transferred between hot and cold objects and the thermal conductivity of materials to improve energy efficiency in buildings or other systems. **SCN 3-04a**

By investigating renewable energy sources and taking part in practical activities to harness them, I can discuss their benefits and potential problems. **SCN 3-04b**

By contributing to experiments and investigations, I can develop my understanding of models of matter and can apply this to changes of state and the energy involved as they occur in nature. **SCN 3-05a**
Hydroelectric power, steam generators

Sciences (Forces, electricity and waves)

By contributing to investigations of energy loss due to friction, I can suggest ways of improving the efficiency of moving systems. **SCN 3-07a**

Sciences (Topical Science)

Through research and discussion, I have contributed to evaluations of media items with regard to scientific content and ethical implications. **SCN 3-20b** *Climate change deniers and the media*

Technologies (Technological developments in society)

I can evaluate the implications for individuals and societies of the ethical issues arising from technological developments. **TCH 3-06a** *Sustainable buildings eg The Crystal, moral obligation to pursue renewable energy sources*

I can identify the costs and benefits of using technologies to reduce the impact of our activities on the environment and business. **TCH 3-07a**

Social studies (People in society, economy and business)

I can use my knowledge of current social, political or economic issues to interpret evidence and present an informed view. **SOC 3-15a**

I can describe how the interdependence of countries affects levels of development, considering the effects on people's lives. **SOC 3-19a** *Control, access and distribution of fossil fuels*

Health and Wellbeing (Mental, emotional, social and physical wellbeing)

Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community. **HWB 3-13a** *Eco-Committee, energy monitors, home-school links*

Literacy (Listening and talking)

I am developing confidence when engaging with others within and beyond my place of learning. I can communicate in a clear, expressive way and I am learning to select and organize resources independently. **LIT 3-10a** *Phone calls on topic. Organise resources*

Numeracy and Maths (Information handling)

I can work collaboratively, making appropriate use of technology, to source information presented in a range of ways, interpret what it conveys and discuss whether I believe the information to be robust, vague or misleading. **MNU 3-20a** *Best type of energy and why. Internet research. – graphs of findings.*

I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology. **MTH 3-21a**



Energy Topic: Fourth Level

Sciences (Planet Earth)

By contributing to an investigation on different ways of meeting society's energy needs, I can express an informed view on the risks and benefits of different energy sources, including those produced from plants.

SCN 4-04a

Through investigation, I can explain the formation and use of fossil fuels and contribute to discussions on the responsible use and conservation of finite resources. **SCN 4-04b**

Through exploring the carbon cycle, I can describe the processes involved in maintaining the balance of gases in the air, considering causes and implications of changes in the balance. **SCN 4-05b**

Sciences (Forces, electricity and waves)

I can help to design and carry out investigations into the strength of magnets and electromagnets. From investigations, I can compare the properties, uses and commercial applications of electromagnets and supermagnets. **SCN 4-08a**

Using a variety of sources, I have explored the latest developments in chemical cells technology and can evaluate their impact on society. **SCN 4-10b**

Sciences (Materials)

I have explored how different materials can be derived from crude oil and their uses. I can explain the importance of carbon compounds in our lives. **SCN 4-17a**

Sciences (Topical Science)

Having selected scientific themes of topical interest, I can critically analyse the issues, and use relevant information to develop an informed argument. **SCN 4-20b**

Technologies (Technological developments in society and business)

I can examine a range of materials, processes or designs in my local community to consider their environmental, social and economic impact. **TCH 4-06a**

I can present conclusions about the impact of technologies on the economy, politics and the environment. **TCH 4-07a**

Social studies (People, place and environment)

I can identify threats facing the main climate zones, including climate change, and analyse how these threats impact on the way of life. **SOC 4-12a**

I can carry out a geographical enquiry to assess the impact and possible outcomes of climate change on a selected region and can propose strategies to slow or reverse the impact. **SOC 4-12b**

Religious and moral education (World religions selected for study)

I can apply my developing understanding of morality to consider a range of moral dilemmas in order to find ways which could promote a more just and compassionate society. **RME 4-05b** *Consider climate justice*

Numeracy and Mathematics

Within real life contexts, I can use scientific notation to express large or small numbers in a more efficient way and can understand and work with numbers written in this form. **MTH 4-06b** *The large volumes of gases in the atmosphere and calculations involving these can offer an opportunity to use scientific notation in a real-life context*