seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

A resource for teaching sustainable energy in Primary Schools

5th and 6th Class

A resource for teachers

This resource will help you bring the topic of sustainable energy into the classroom in the context of the Primary Science Curriculum and the Green-Schools programme. It will help children learn about energy in a real world way, exploring how and why as a society we need to develop new ways to meet our energy needs. This resource makes teaching energy engaging as children see it as relevant to their own lives and future well-being. As children learn about sustainability, they will develop behaviours that benefit them and wider society. Overall, the resource will help children gain an understanding of our current energy challenges and potential future solutions.

How to use this resource?

There are five chapters in this booklet covering the topic of sustainable energy. Each chapter has the following structure:

- Aims
- Overview
- Working scientifically skills
- Primary Science curriculum link
- Resources
- Main body of lesson
- Extension

All chapters have supporting interactive whiteboard activities and PowerPoint slides (for those teachers who do not have access to an IWB) and photocopiable master sheets to help learning. These can be accessed and downloaded at **www.seai.ie/teaching-sustainability**

Other resources from SEAI for schools

- All teaching resources are on our website **www.seai.ie/teaching-sustainability**
- If you would like hard copy resources e-mail **schools@seai.ie**
- We can visit your school and run workshops for pupils and teachers. See **www.seai.ie/teaching-sustainability/primary-school/** for more details and bookings.
- Your pupils can enter SEAI's One Good Idea competition to showcase their energy projects **www.seai.ie/onegoodidea**
- The e icon is used in this booklet to identify lessons that involve pupils in saving energy at school, go to this website for resources **www.energyineducation.ie**

SEAI supporting Schools

SEAI works with the public, businesses, communities, schools and government to achieve a cleaner energy future. We run campaigns and initiatives to increase awareness on sustainable energy and change behaviours. Children are key to this sustainable energy transition.

DCU
Ollscoil Chathair Bhaile Átha Cliath
Dublin City University

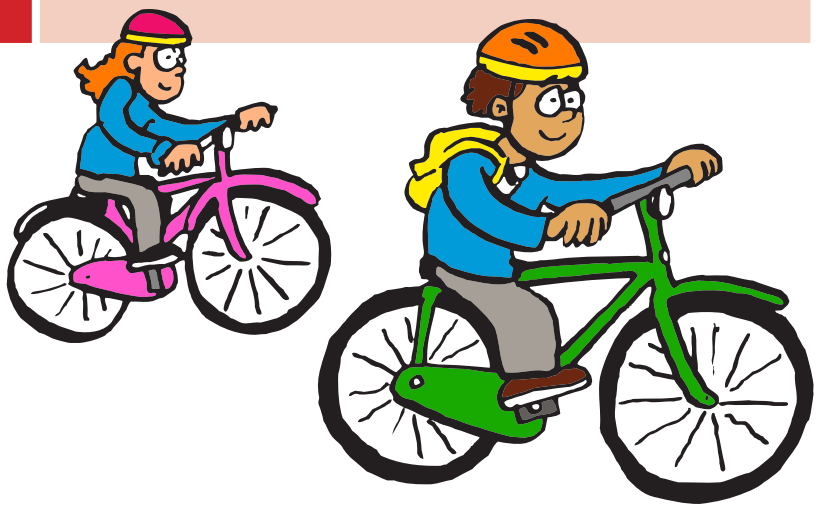
This programme was researched and developed by the School of STEM Education, Innovation and Global Studies and the Centre for the Advancement for STEM Teaching and Learning (CASTeL) in DCU Institute of Education.

CONTENTS

e Look for the this icon to find lessons that can be used to involve pupils in energy saving in school in conjunction with the Energy in Education programme. www.energyineducation.ie

CHAPTER 1: The Energy We All Use

Aim	The aim of this chapter is to critically explore renewable energy and examine its advantages and disadvantages.
Overview of Chapter	The first lesson in this chapter explores how energy is used in the school environment. Lesson two examines renewable sources of energy.
Working Scientifically Skills	Through discussion of, engagement with and reflection on the content in these lessons, children will be applying and developing the following working scientifically skills: • Analysing and classifying • Recording and communicating
Primary Science Curriculum link	Strand unit: Caring for my locality and area; magnetism and electricity



Lesson 1 – Energy in our school

Resources	IWB 1 / PowerPoint 1: Energy in our school

Activity type: Discussion

Use **IWB 1 activities/ PowerPoint 1** to discuss how energy is used in the school.

Questions to promote discussion

Scenario 1: Getting to school

1. How did you travel to school today?
2. If you travelled by car/bus what source of energy was used?
3. Did you travel by train or tram? What source of energy was used?
4. Did you walk or cycle to school? What source of energy was used?
5. What do you think is the most environmentally friendly way to travel to school?

Scenario 2: Energy in the school

1. What kinds of energy are being used in the picture?
2. Do you think renewable sources of energy are being used? Why/ Why not?
3. Do you think non-renewable sources of energy are being used? Why/ Why not?
4. What are the consequences of our dependency on non-renewable sources of energy?

The children could work in small groups to discuss energy use in the school.

Lesson 2 – Renewable energy sources: Advantages and disadvantages

Lesson link	1st and 2nd Class Programme Chapter 2 Lesson 1: Sources of energy and Lessons 2 and 3: Renewable and non-renewable energy (i) and (ii)
Resources	A3 sheets of paper, Markers/ crayons/ colouring pencils PCMs 1 – 6: Renewable energy factsheets

Teacher note: Fossil fuels have environmental disadvantages such as causing pollution and climate change. But there are also advantages to using fossil fuels. For example, they are cheaper and are more easily accessible to the public. There are advantages and disadvantages in using renewable energy sources. Disadvantages include cost and dependency on the weather. One advantage is that they are environmentally friendly. In this lesson children are encouraged to think critically about renewable sources of energy.

Activity type: Discuss and research

Split your class into groups. Give each group a set of Renewable energy factsheets **(PCMs 1 – 6).**

1. In each group the children work in pairs. Each pair selects two sources of renewable energy from the sheets and lists two advantages and two disadvantages associated with their sources. Encourage the children to think about the global and Irish contexts.
2. Each pair reports back to the rest of their group on the two advantages and disadvantages they have selected from their fact sheets.
3. Each group then compiles a poster of the advantages and disadvantages of using different renewable energy sources.

Afford the children time to read other groups' posters. Ask the children to see if they can find similarities and differences between the different posters.

CHAPTER 2: Energy in our Lives

Aim	The aim of this chapter is for children to explore sources of renewable and non-renewable energy that are frequently used in our daily lives. They will also gain an understanding of our reliance on non-renewable sources of fuel.
Overview of Chapter	The children are required to discuss the positive and negative aspects of using wind turbines and factors that affect their location and design. Children then design and make a model wind turbine. They will look at the extent to which fossil fuels are used in Ireland and abroad and learn how fossil fuels are created.
Working Scientifically Skills	Through discussion of, engagement with and reflection on the content in these lessons, children will be applying and developing the following working scientifically and designing and making skills: • Analysing and classifying • Exploring • Planning • Making • Evaluating • Designing and making: exploring, planning, making and evaluating
Primary Science Curriculum link	Strand unit: Weather; climate and atmosphere; forces

Lesson 1 – Exploring wind energy

Resources IWB 2 / PowerPoint 2: Wind turbines

Activity type: Discuss and research

Use **IWB2 / PowerPoint 2** to discuss different locations of wind turbines.

Questions to promote discussion

1. Examine the images. What do they tell you about wind energy?
2. In what kinds of locations do you find wind turbines?
3. Look at the locations where the different wind turbines are placed. Are they on their own, near buildings or on top of buildings?
4. Think about the people/buildings that might be affected by installing the wind turbines.
5. Look at the direction the wind turbines are facing. Why do you think they are facing in this direction? *(prevailing winds).*
6. Why do you think a mountain/farmland/sea is a good location for a wind farm?
7. Do you think there are any disadvantages to generating energy in this way? *(location of wind turbines, farm land, scenic spots, wildlife).*
8. Why do you think people oppose wind farms?
9. How does this relate to the advantages and disadvantages of wind energy?
10. If you were a wind farm developer how would you incorporate people's concerns into your design?

Activity type: Design

In groups the children make a detailed drawing of an ideal location for a wind turbine in their local area. Encourage each group to discuss factors that need to be considered.

Lesson 2 – Design and make a wind turbine

Resources IWB 2 / PowerPoint 2: Wind turbines

Some suggested materials to make wind turbines:

A sheet of paper/ card (to make blades of windmill if not using wood)

Resources

A pencil, scissors, a ruler, digital camera (for children to record stages in the design and make process), panel pin hammer (available in any DIY store) , nails (panel pins 25mm), coping saw (optional) , pieces of wood (plywood/ white deal), dowelling, safety goggles

Teacher note: An alternative to this type of wind turbine is in the extension section of this lesson (using paper/card).

Activity type: Design and make

Teacher note: This lesson will take a number of days to complete. The design and make process involves four stages, it is important to follow these stages as outlined in the lesson below. Allow more time for the making phase and allow time after the planning phase to discuss the designs with the children.

Exploring

Discuss photographs of different wind turbines on **IWB 2 / PowerPoint 2**

1. How do the wind turbines work?
2. How do they use the wind?
3. What are they made from?
4. Where are they located?

The children could also search the web for different wind turbine designs.

Planning

In groups, children discuss criteria required to make a wind turbine for a chosen location. Record the children's ideas and then select 3 or 4 criteria that the children must adhere to when designing and making their wind turbines. All groups should also be aware of the location for which they are designing their turbine.

For example

- It must be at least 30 cm high.
- It must catch the wind.
- It must rotate freely.

Show the children the materials that are available to make the wind turbines.

Safety note: Practice using the tools listed in the resource section. The level of practice and teacher input will depend on how experienced the children are at using the tools. Teach the children how to use the tools correctly and safely. Start slowly, introduce one tool at a time and use the correct terms for the tools. Consider the lengths of the pieces of the wood to make blades and think about how the wind turbine will balance.

Planning and making

In groups children discuss and draw a diagram of their wind turbine design. They then make their wind turbines. Children photograph the designs of each group at various stages in the design process. These photographs could be printed and used to present the design process on a wall chart and /or added to a school blog.

Evaluating

Provide each group with the opportunity to present their plans and finished wind turbines to the rest of the class. Encourage them to discuss their designs and whether or not their wind turbines met the criteria outlined at the beginning.

Questions to promote discussion

1. Did you follow your original design?
2. Did you encounter any difficulties?
3. How did you overcome these?
4. What do you like most about your wind turbine?
5. If you were to make another wind turbine is there anything you would do differently?

Extension	Design and make activity from the book **The Energy File: How to make a windmill (page 12)**

Lesson 3 – Where do we get our energy from?

Lesson link	**1st and 2nd Class Programme Chapter 2 Lesson 1: Sources of energy and Lessons 2 and 3: Renewable and non-renewable energy (i) and (ii)**
Resources	**IWB 3 / PowerPoint 3: Energy sources** **IWB 4 / PowerPoint 4: Energy sources – Graphs** **PCMs 7 and 8: Energy sources – How much do we use?** **PCMs 9 and 10: Energy sources – What types of energy do we use**

Teacher note: If the children have not discussed renewable and non-renewable sources previous to this please review the lessons above. A prior knowledge of percentages is also useful.

Activity Type: Discussion, interpreting graphs

Finding out children's ideas about energy

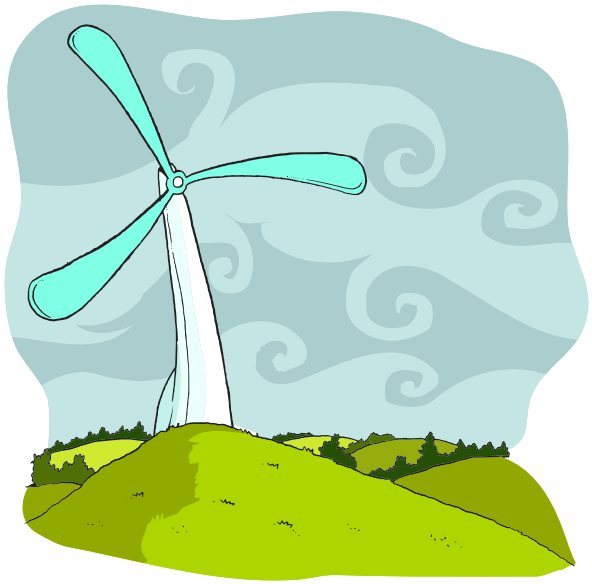
Use **IWB 3 activities**. If you do not have access to an IWB use **PowerPoint 3** to promote discussion on different sources of energy. The children could work in small groups to discuss different forms of energy.

Questions to promote discussion

1. What do all of these things have in common? *(they are sources of energy).*
2. Which of these sources are renewable?
3. Which of these sources are non-renewable?
4. Can you explain what a renewable source of energy is?
5. Can you explain what a non-renewable source of energy is?
6. What advantages are there to using renewable/ non-renewable energy sources?
7. Do you use any renewable/ non-renewable sources of energy in your home?

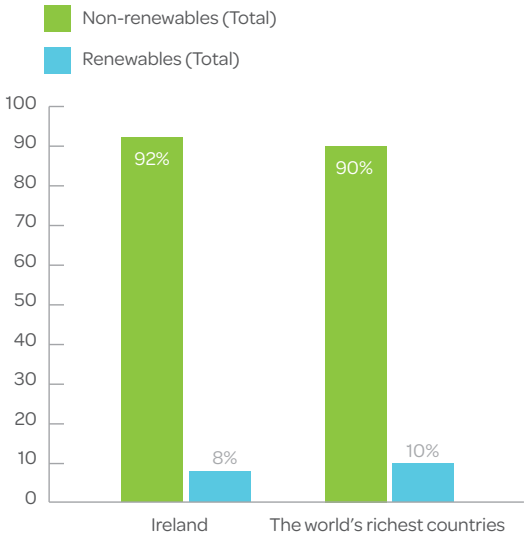
The children could group the pictures on **IWB 3 / PowerPoint 3** into renewable and non-renewable sources of energy. Encourage the children to justify their choices.

Teacher note: The graphs on **PCMs 7 and 9** show the different sources of energy we use in Ireland and in the world's richest countries. Children examine the graphs and answer the questions on **PCMs 8 and 10**



PCM 7 Graph 1

% of renewable and non-renewable sources of energy used in the world's richest countries and in Ireland 2016

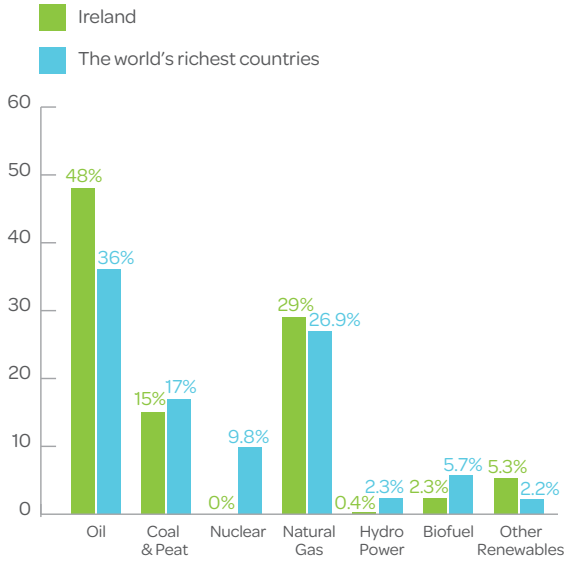


PCM 8

1. What source of energy is used most in Ireland and in the world's richest countries?
2. Can you name all the sources of non-renewable energy?
3. Can you name all the sources of renewable energy?

PCM 9 Graph 2

% breakdown of the sources of renewable and non-renewable energy used in the world's richest countries and in Ireland 2016



PCM 10

1. List the sources of energy that Ireland uses, starting from the one that is used most, to the one that is used least.
2. List the sources of energy that the world's richest countries use, starting from the one which is used most, to the one that is used least.
3. What sources of energy does Ireland use more of than the world's richest countries?
4. What types of energy do the world's richest countries use but Ireland does not?

IWB 4 / PowerPoint 4: Energy Sources can be used to promote whole class discussion.

Sources of information:

Ireland: www.seai.ie/resources/publications/

Please note that the "world's richest countries" relates to OECD countries only and has been simplified. http://www.iea.org/publications/freepublications/publication/KeyWorld2017.pdf

Extension	Activities from the book The Energy File: Energy in Ireland (page 44) and Energy Worldwide (page 52)

Lesson 4 – What makes renewable and non-renewable sources of energy different?

Lesson link	3rd and 4th Class Programme Chapter 3 Lesson 2: Introducing climate change
Resources	Access to computers and internet PCM 11: Energy web quest research template PCM 12: Energy web quest 2

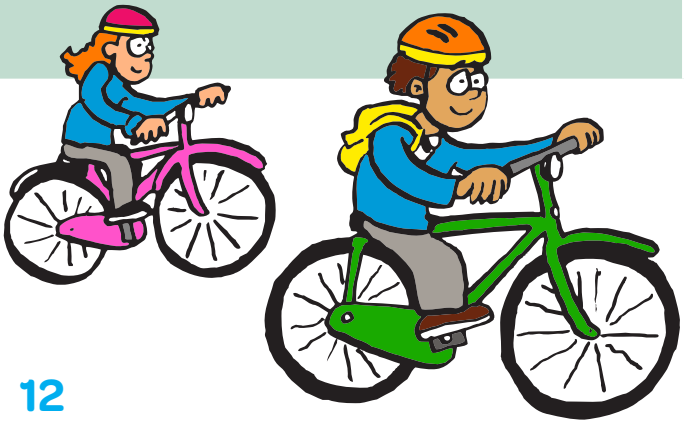
Activity type: Web quest

This lesson is a web quest. The purpose is to familiarise children with the use of computers for self-guided research. Go to www.seai.ie/teaching-sustainability/primary-school/resources-for-teachers/web-quest-mission/?__toolbar=1 for a step by step guide to carrying out your web quest.

Extension activity	After you have completed the web quest some of your class may wish to complete SEAI's Renewable Energy Lesson plan which can be downloaded from www.seai.ie/teaching-sustainability/primary-school/resources-for-teachers/

CHAPTER 3: How Energy can Impact our Lives: A Story from the Past

Aim	The aim of this chapter is to introduce children to the unit of power, the Watt.
Overview of Chapter	In these lessons children will explore how power is generated from energy sources, such as fossil fuels. The children will learn about the famous inventor James Watt and the unit of power, the Watt. These lessons link to History within the SESE curriculum and a prior knowledge of the Industrial Revolution may be useful.
Working Scientifically Skills	Through discussion of, engagement with and reflection on the content in these lessons, children will be applying and developing the following working scientifically skills: • Observing • Predicting • Analysing and classifying • Recording and communicating
Primary Science Curriculum link	Strand unit: Forces; magnetism and electricity



Lesson 1 – What made James Watt famous?

Resources PCM 13: The Story of James Watt

Activity type: Sort and discuss

Divide the class into groups. Print out one copy of **PCM 13 The Story of James Watt** per group. Cut up each statement and put them into an envelope (not in order). Give each group an envelope. Ask the children to read through the statements in the envelopes and then see if they can discover how and why James Watt became famous.

The children report back to the whole class. Different opinions may emerge and these can be explored further.

Lesson 2 – What's a Watt? Exploring steam power and electricity e

Resources 2 bulbs: 1 incandescent 40 or 60W bulb and 1 16W compact fluorescent light (CFL) bulb (per group), magnifying glasses, 2 kettles (the same size to ensure fair test), jug, magnifiers

Safety note: A boiling kettle is used in this lesson. Please be careful with steam and place the boiling kettle in an appropriate area of the classroom away from the children.

Activity type: Teacher led investigation

This lesson introduces the idea of how steam can generate electricity and introduces the unit of electrical energy, the kilowatt hour. It is a precursor to Chapter 5, Saving Energy.

Finding out children's ideas

1. What happens when you boil a kettle?
2. How do you know the water has boiled?
3. What comes out of the kettle once the water has boiled? *(steam)*
4. Do you know how steam is made?
5. Do you think a full kettle will boil quicker or slower than one that is half full?
6. How could we find out?

Investigation question: "Will a kettle full of water boil faster than a kettle that is half full of water?"

Pour 500ml of water into one kettle and 250ml into a second. Ask the children to predict which kettle they think will boil first. Record their predictions and ask them to give a reason for their predictions. Switch on both kettles and allow to boil.

Teacher note: If you do not have two kettles, this investigation can be done with one kettle. However, make sure you allow the kettle time to cool down before you pour in the second amount of water.

Questions to promote discussion

1. Which kettle boiled quicker?
2. Why do you think this happened?
3. Which kettle do you think used more energy?
4. What have you learned from this investigation?
5. What did you see coming out of the kettle when the water was boiling?
6. Where did the steam go?
7. What do you think would happen if the steam hit a cold surface?

To illustrate condensation boil the kettle again and teacher can place a mirror or saucer over the spout of the kettle. Use a cloth/tea towel to hold mirror or saucer as they may get very hot. Encourage the children to carefully observe what happens to the steam.

Activity type: Research

Using a range of sources the children research the answers to the following questions:

1. How was steam used in the past: to generate energy?
2. How is steam used today: to generate energy?
3. How might steam be used in the future: to generate energy?

Activity type: Observation

Using magnifying glasses ask the children to carefully observe the different bulbs. Then encourage them to make a detailed drawing of one of the bulbs and list the different types of material from which the bulb is made.

Discuss their observations/ drawings with them. Draw their attention to the W sign on the bulbs. Ask the children if they know what the W stands for. *(Watt, named after James Watt).*

Teacher note: Explain to the children that the Watt is used to measure the amount of power a bulb uses, not how bright it is. Traditional incandescent light bulbs waste 90% of their electricity to produce heat, and use only 10% to produce light. The solution: energy efficient bulbs, which use fewer watts to give off the same amount of brightness. For example, a 16W CFL will give the same brightness as a 40W incandescent bulb and uses less energy.

Ask the children to look at the bulbs again and answer the following questions.

1. How much electrical power do you think a 40/60/16 W bulb uses in one hour *(answer 40/ 60/ 16 Watts)*
2. Which bulb do you think is the most energy efficient? Why?
3. Which type of bulb do you think we should use in our homes?

Teacher note: Explain that the electricity meter in our homes or school measures the amount of electricity we use. This amount is given in Kilowatt hours (kWh) and we pay per kWh. Electricity companies sell electricity in kWh units. These units are equivalent to 1kW used for 1 hour.

To teach the children how to read their electricity meters, use SEAI's **Energy in Education – Student Energy Log Book.** This can be downloaded from: **http://www.energyineducation.ie/Energy_In_Education/Information_for_Schools/Resources_and_links/index.html** Both the log book and a wall chart to record energy usage can be ordered from SEAI.

The children can learn about how to calculate energy bills by looking at the video **Measuring and saving energy at schools with Guzzler**. This can be viewed at **www.primaryscience.ie/activities_advanced_search.php?magentism-electricity=magentism+and+electricity&middle-senior=1&keywords=&search=Search**

Extension

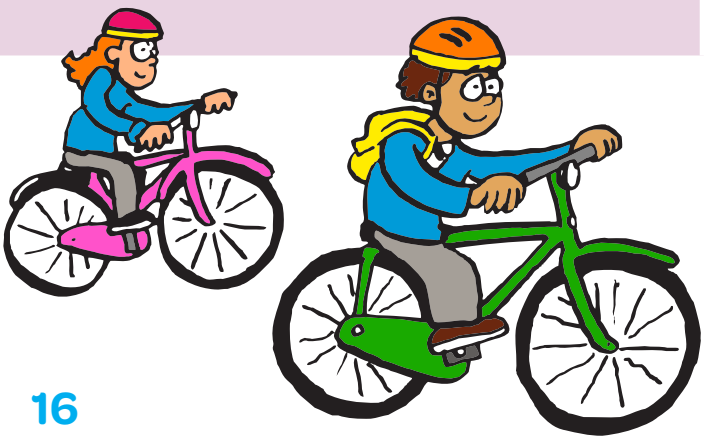
Lesson plan, **www.seai.ie/teaching-sustainability/primary-school/resources-for-teachers/**

Activity from the book, **The Energy File: How to build a water wheel (page 10)** can be used to introduce the concept of rate; you could test how much water is needed to make the water wheel turn 10 times and 20 times in one minute.

Go to **Energy in Education** for factsheets and videos on energy saving at school.

Chapter 4: Energy on the Move

Aim	The aim of this chapter is to explore how energy can be transferred from one object or medium to another. Energy can be transferred through solids (conduction), through water/air (convection) and from the sun (radiation).
Overview of Chapter	There are three lessons in this chapter. The first investigates conduction, the second convection and the third radiation.
Working Scientifically Skills	The children will be applying and developing the following working scientifically skills: • Observing • Predicting • Investigating and experimenting • Estimating and measuring • Recording and communicating
Primary Science Curriculum link	Strand unit: Heat; properties and characteristics of materials; materials and change



Lesson link	3rd and 4th Class Programme Chapter 4: all lessons

Lesson 1 – Conduction

Resources	IWB 5 / PowerPoint 5: Energy on the move - Conduction, convection and radiation 1 long metal spoon, bowl or tray, hot water (or packet soup), butter, pea or plastic bead

Activity type: Teacher led investigation

Use **IWB 5 activities/PowerPoint 5:** to find out and develop the children's ideas about conduction.

Questions to promote discussion

1. What equipment is used for cooking food? *(saucepans, frying pan, wooden spoons, plastic spoons etc.).*
2. What materials are these made from?
3. Why do you think different utensils are made from different materials?
4. Why do you think saucepans are made from metal?

Investigation question: "Can heat move through metals?"

Place a pea on a blob of butter half way up the long metal spoon and a second pea on a blob of butter towards the top of the metal spoon (See illustration on **IWB 5 / PowerPoint 5).** Ask the children to predict what they think will happen to the peas if you place the spoon in a bowl of hot water. Encourage them to give a reason for their predictions. Pour hot water into a bowl. Place the round end of the spoon in hot water. Observe which pea falls off first. Discuss the investigation with the children.

Questions to promote discussion

1. What did you predict would happen?
2. What happened?
3. Which pea fell first?
4. Why do you think this happened?
5. What does this tell us about metal and heat? *(this shows that heat travels up through the spoon).*

Lesson 2 – Convection

Resources

IWB 6 / PowerPoint 6: Energy on the move - Conduction, convection and radiation

Small plastic bottle with lid (yogurt drink/travel bottle), needle (to make a small hole), thread, food colouring, beaker or glass (must be transparent), hot water, cold water, blu-Tack

Activity type: Teacher led investigation

Teacher note: This investigation could also be conducted in groups but care is required when handling hot water.

Put a small hole in the lid of the bottle and place a thread through it. Tie a knot in the thread. Place a pebble or a piece of blu-tack inside the bottle to weigh it down. Fill the bottle with hot water as near to the top as possible so that there is no air bubble. Add 2 or 3 drops of food colouring to the water. Ask the children what they think will happen if you submerge the bottle of coloured water into a beaker of cold water. Ask them to give a reason for their predictions. Ask each child to draw a diagram of what they think will happen. Drop the bottle of hot coloured water into the beaker of cold water and observe. Discuss their observations.

Questions to promote discussion

1. What did you see? *(food colouring comes out of the bottle and rises into the beaker).*
2. Why do you think this happened? *(the hot coloured water is less dense than the cold water and therefore it rises).*
3. What happened to the clear water? *(it changes colour starting from the top of the beaker).*

Lesson 3 – Radiation

Resources

IWB 7 / PowerPoint 7: Solar oven

PCM 14: Planning your investigation

PCM 15: Recording your investigation

3 different sized pizza boxes, stiff black paper , aluminium foil, clear plastic (plastic cellophane works well), glue, cellotape, scissors, rulers, markers, small bar of chocolate, 3 small paper plates (to fit inside the oven), lollipop sticks or dowel, blu-tack

Activity type: Design and make

Teacher note: This lesson is divided into two parts. In the first part the children make a pizza box solar oven which demonstrates radiation (energy from the sun) and in the second part they use the solar oven to carry out a fair test investigation. Ideally the investigation should be carried out on a sunny day. Three solar ovens per class are required to conduct the investigation.

Show the children the materials that are available to make the solar oven (see resource list). Discuss the properties of these materials for example foil is a reflector of light, black paper absorbs light. Explain that they are going to make 3 solar powered ovens by attaching these materials to the inside of the pizza boxes (see image on **IWB 7/ PowerPoint 7**). Children make 3 ovens per class. More ovens can be made depending on the availability of resources.

Further directions for making the pizza box solar oven are available from **The Energy File: The pizza box solar oven (page 32).** Make sure to cover the inside of the box with foil.

Now use your ovens to investigate the question below.

Activity type: Investigation

Teacher note: This lesson investigates heat transfer and looks at one method of using the sun's radiation as a renewable source of energy. For further information on solar energy please visit: **www.seai.ie/sustainable-solutions/renewable-energy/solar-energy/**

Brief explanation

Heat from the sun gets trapped inside the solar oven, which starts to get very hot. How does it happen? The foil reflects rays of sunlight into the box. Rays pass through the plastic cellophane and heat up the air that is trapped inside. The black paper absorbs the heat at the bottom of the oven.

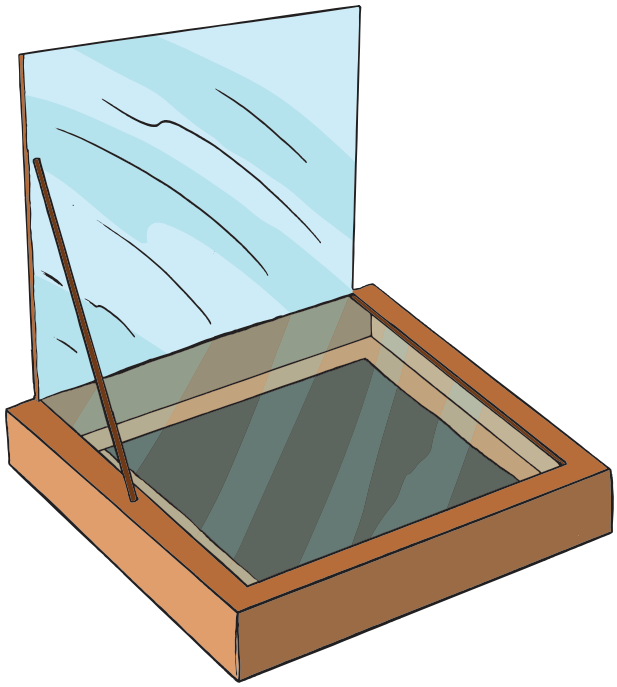
Investigation question: "Which oven will melt a square of chocolate first?"

Present the investigation question to the children and ask them to think about how they could carry out this investigation. Each group records their ideas on **PCM 14 (Planning your investigation)**. Discuss their ideas.

Questions to promote discussion

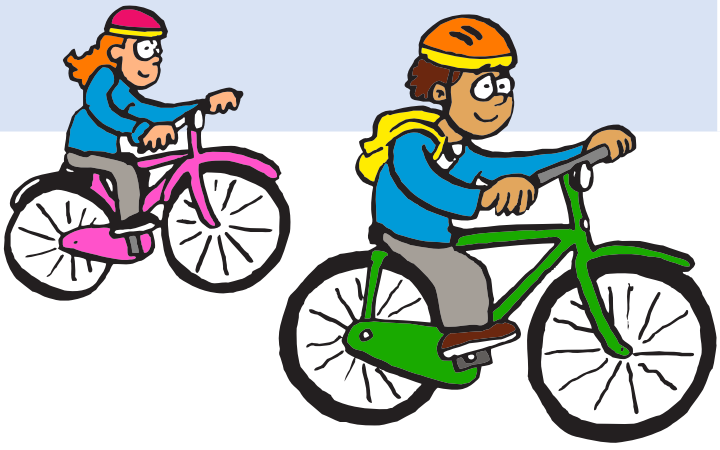
1. How are you going to carry out the investigation?
2. How will you make it a fair test?
3. What will you change? *(size of the pizza box)*
4. What will you keep the same? *(position in the sun, size of the piece of chocolate)*
5. What do you predict will happen? Why?
6. What are you going to observe? *(the chocolate melting)*
7. How are you going to measure this? *(how long it takes the chocolate to melt)*

Conduct the investigation by placing an equal amount of chocolate in each solar oven. Then place the three solar ovens in a sunny location. Discuss the results of the investigation and record on **PCM 15** (Recording your investigation). The investigation can be conducted as a whole class or group investigation, depending on how many pizza box solar ovens have been made.



CHAPTER 5: Saving Energy

Aim	The aim of this chapter is for children to design and conduct their own energy audit of the school.
Overview of Chapter	The chapter focuses on energy conservation in school and in the wider community. In lesson 1 the children conduct a survey on the energy use in school and graph their results. They then work with the whole school to promote energy saving within the school.
Working Scientifically Skills	In this chapter the children will be applying and developing the following working scientifically skills: • Observing • Investigating and experimenting • Estimating and measuring • Recording and communicating
Primary Science Curriculum link	Strand unit: Caring for my locality and area



Lesson 1 – Saving Energy in our school

Resources

IWB 8 / PowerPoint 8: Saving energy in our school
PCM 16: School energy audit sheet
A3 poster paper, crayons, markers, colouring pencils (per group)

Activity type: Discussion

Use IWB 8 activities/PowerPoint 8 to discuss saving energy in the school.

Questions to promote discussion

1. How do you travel to school?
2. What is the most/least common form of transport used?
3. How could we find out?
4. How do we use energy in our school?
5. How do we waste energy in our school?
6. How could we save energy in our school?

Divide the class into groups. Each group is going to conduct an energy audit for a particular area of the school. To do this, the children must first develop an audit sheet. PCM 16 can be used as a guide. Before the children discuss how they are going to carry out the audit, it might be useful to watch the video clips on IWB 8/PowerPoint 8. These will provide the children with ideas for saving energy in the school. These video clips can also be downloaded from:

http://vimeo.com/51626564 top ten tips for saving energy in school

http://vimeo.com/51625599 saving energy in your classroom

http://vimeo.com/51822005 St Clare's school saving energy

After the children have carried out their audit they present their findings to the whole class.

Questions to promote discussion

Lights

- Does the school make the most of natural daylight?
- Do we turn off lights when they are not needed? *(e.g. on a sunny day).*
- Does the school use energy efficient lighting? See the factsheet and video on lighting http://www.energyineducation.ie/Energy_In_Education/Information_for_Schools/Resources_and_links/index.html

Heating and Insulation

- Are there radiators left on unnecessarily?
- Are the windows draught proofed?
- Is the water heater turned off when the school is closed?
- Are the water pipes and the water tank insulated?
- What kind of insulation is used in the school?
- Is the attic insulated?"

Water

- Does the school have a water meter?
- How is water heated?
- Are there any leaking taps?
- Are the taps left running?"

Appliances

- Are electrical appliances turned off when not in use?

After the audit is carried out the children can collate and present their findings for consideration by the Principal and the Board of Management. These findings can then be implemented throughout the school. The **Student Energy log book** and **Energy Detectives wall chart** are available to order from SEAI or to download from **www.energyineducation.ie**. These can be used to record how many units of energy or kWh are being used by the school.

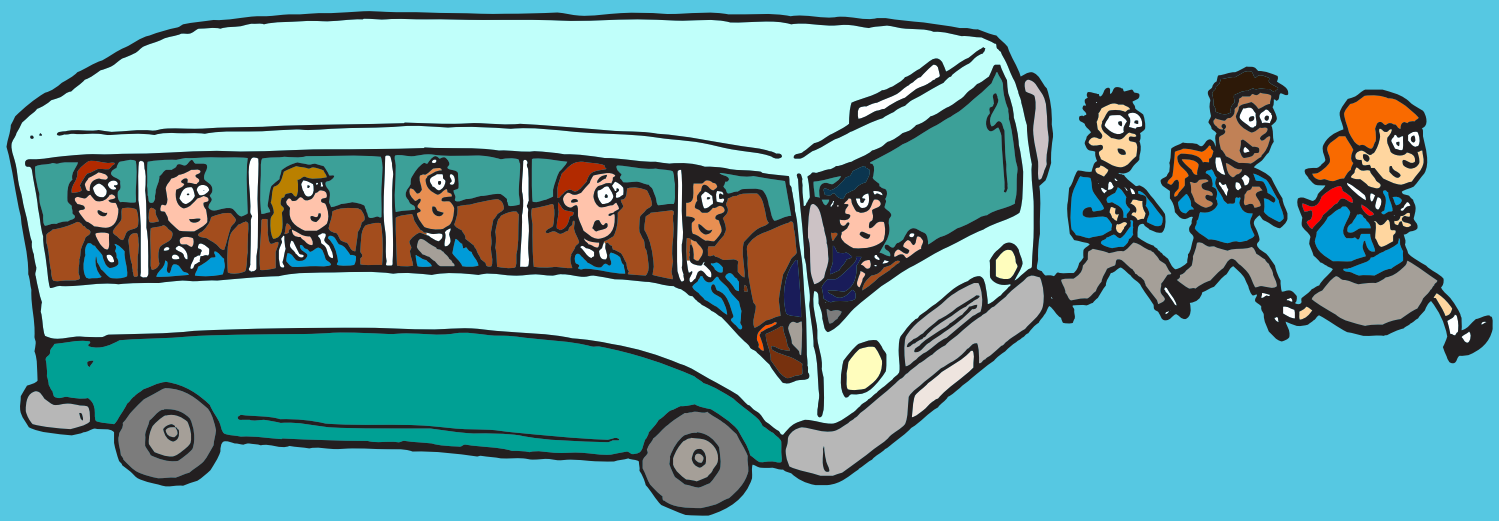
Older children could work with younger children to make posters to provide tips / guidelines for saving energy throughout the school. The poster could include 5 top tips. These posters could be displayed throughout the school.

Extension

Activity from the book **The Energy file: Energy in School (page 43)**

Go to **Energy in Education** for factsheets and videos on saving energy at school.

NOTES



SUSTAINABLE ENERGY AUTHORITY OF IRELAND

t +353 1 808 2100
e schools@seai.ie
w www.seai.ie/teaching-sustainability

@SEAI_Schools