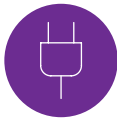




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Guzzler's Party

Teaching Resources



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Guzzler's Party Teaching Resources

Year first published 2023

Welcome to Guzzler's Party Activity Book! This resource, developed by the Sustainable Energy Authority of Ireland (SEAI), has lots of fun and educational activities that can help you teach your students about energy.

Guzzler's Party is an illustrated story book aimed at primary school classes from junior infants to 2nd class. Alina shows how you can save energy, while Guzzler prepares for the energy party. It is available to download or you can borrow a class set from your local library.

This workbook uses interactive activities to communicate the importance of energy in our lives and to introduce the idea of saving energy whenever we can.

Teaching approach

These activities are designed to support open-ended, inquiry based hands-on investigations, where possible. They are designed to support a constructivist approach to teaching and learning. This builds on children's existing ideas and experiences from which they then further develop their ideas or construct new ones based on evidence from investigations. Sustained shared thinking, with discussion and questioning, are crucial to the success of this type of approach. Equally, the role of the adult is one where they should facilitate the children's learning, with less emphasis on teacher directed activities.

How to use this resource

Guzzler's Party should be read aloud a number of times over a period of time either as whole class shared reading or small groups reading it, allowing lots of time to enjoy and explore the illustrations. Following each reading, activities can be chosen to develop children's knowledge and understanding of the different concepts raised, as well as support development of skills and concepts from across the curriculum, in particular science.

Note: The book, Guzzler's Party, is suitable for pupils from Junior Infants to Second Class. While these themes have been planned for the infant classes specifically, many of the learning objectives/learner outcomes are also in line with the 1st/2nd class curriculum. The following abbreviations have been used throughout to identify what class level the objectives pertain to: J = junior infants, S = senior infants, 1 = first class and 2 = second class.

Note: Template adapted from the Suggested Framework for an Integrated Approach to Inquiry Based Learning co-created by the Professional Development Service for Teachers and Science Foundation Ireland.

Acknowledgements

This resource was researched and developed by Associate Professor Orla Kelly of 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, with 'Guzzler's Party' project partners Lucinda Jacob, author, and Alan Nolan, illustrator.



Theme 1: Sun energy

Put simply, energy is the ability to do work. All energy derives from the sun. We can feel this energy directly by feeling the warmth of the sun's rays on our skin.

Background knowledge for teachers

In **theme 1a**, Guzzler and Alina are in the school garden. Plants convert light energy from the sun into food energy in the process known as photosynthesis. Food energy is a form of chemical energy. In this theme, pupils grow their own broad beans to explore conditions for growth. For extension activities, see [Energy Long Ago](#), to further connect energy to the theme of food.

In **theme 1b**, Guzzler and Alina get their energy from their breakfast. Some foods provide more energy than others and it is food that gives us the energy we need throughout the day. We get energy from carbohydrates, fats and proteins in our food. This is chemical energy which we then convert to kinetic energy to move, run and work.

In **theme 1c**, Guzzler and Alina scoot and cycle to school. They are now using the energy from their breakfast. We can exert a force on different objects (our scooter or a toy car) to make them move. This is kinetic energy.

For further information and theme ideas on energy, see [Introducing Energy for the Infant classes](#) or [First and Second class](#) from SEAI schools' resources.



Theme 1a: Sun energy

Curricular area	Science	Geography
Strand	Living things	Human environments
Strand unit	Plants and animals	People and places in other areas
The children should be enabled to:	<p>Explore conditions for growth of bulbs and seeds (J, S)</p> <hr/> <p>Explore, through the growing of seeds, the need of plants for water and heat (1, 2)</p>	<p>Become aware of some links between the school or local community and people in other places (J, S)</p> <hr/> <p>Appreciate ways in which people in different areas depend on one another and on people living in other parts of the world (1, 2)</p>
Skills	Predicting, observing, investigating, recording	A sense of place, Picturing places
Target language	Seed, seedling, leaves, shoot, root, sun (solar) energy, photosynthesis	
Key learning	Plants need sunlight energy to grow; we then get energy from plants to grow, move and develop	
Resources	Broad bean seeds, (or seedlings) (Aquadulce Claudia good for Autumn planting, harvesting in May); some space to plant outside once they are hardy enough in planters or in the ground; compost.	



Engage: Getting started

Generate – set the context	<p>In the story, Alina gets warm from playing in the school yard. Invite children to think about times when they have felt warm.</p> <ul style="list-style-type: none"> – What were you doing? – Have you been hotter on some days outside than others? – Why?
Wonder and Explore – find out children's ideas through questioning and discussion	<p>Questions to promote discussion</p> <ul style="list-style-type: none"> – Do you think the sun is important? – Why do you think the sun is important? – Apart from helping us feel warm, what else does the sun do?



Investigate: Working on the enquiry

Key learning experience

Investigation

→ Set the context

In the story, we see Guzzler and Alina in the school garden. What things can you see on the page? They also use herbs they have grown at home on the pizza!

→ Questions to promote discussion

- Do you think it is good to grow your fruit or vegetables?
- Has anyone grown fruit or vegetables at home?
- Has anyone eaten fruit or vegetables from someone's garden or farm?
- What do you think plants need to grow?

→ Investigate

In groups, they carry out an investigation into plant growth. The class should identify different things they think plants need to grow and investigate this. They should predict which seedlings will grow best and suggest why.

If growing from seeds, an option is to grow them in egg boxes and when they are ready to plant out, the young seedling can be planted out in its egg box as it will eventually compost and will mean less damage to the roots as it is moved.

→ Record

They can record their findings using their preferred choice; photos, drawings, observations.

→ Discuss

Through discussion the children can explore what things plants need to grow and that the sun gives energy to plants to grow and produce food, which we then eat to get energy – which is our fuel for growth and movement

→ Enjoy

Once the beans are ready to harvest, the children can enjoy them either raw or cooked. They can be harvested at the mange tout stage (i.e. before the individual beans form) when they are about 10cm long, or left for podding for individual beans. Broad beans should be ready from May.



Take the next step: Digging deeper

Applying learning

Invite the children to model, act out, draw or write something to show the energy flow from the sun to plants and then to us.

Making connections

Take a trip to the local shop, just like Guzzler and Alina do in the story, and investigate the origins of the different fresh fruit and vegetables on offer. This can be done at different times of the year to explore differences and seasonal food. For example, strawberries are more likely to be 'local' in summer in Ireland than in winter! What about tomatoes or blackberries?

The children could take photos of the different packaging information and then do some simple research back in the classroom using a large wall map. Which fruit or vegetable travelled the furthest? Which was the most local? How do they think the food travelled?





Theme 1b: Energy for Guzzler and us!

Curricular area	Science	SPHE
Strand	Living things	Myself
Strand unit	Myself	Food and Nutrition
The children should be enabled to:	Become aware that people have a variety of needs for growth (food) (J, S)	Become aware of the importance of food for growth and development (J, S)
	Identify some requirements for growth and development in the human (food) (1, 2)	Discuss and explore some qualities and categories of food (J, S)
		Explore the importance of food for promoting growth, keeping healthy and providing energy (1, 2)
Skills	Questioning, Predicting	
Target language	Food, fuel, energy	
Key learning	We get our energy from plants to grow, move and develop. Food is our fuel!	
Resources	Wheat biscuit cards (Appendix 1) Bowls with 1, 2 or 3 wheat biscuits in them; enough for each child to have one card; Lunch box activity sheet (Appendix 2)	



Engage: Getting started

Generate – set the context

In the story, we see Guzzler and Alina eating breakfast.

Questions to promote discussion

- What are Guzzler and Alina eating for breakfast?
 - Do you think Guzzler is enjoying his breakfast?
 - What do you like to eat for breakfast?
-

Wonder and Explore – find out children's ideas through questioning and discussion

Whole-class discussion

- How do you think Guzzler and Alina feel after they have eaten their breakfast?
- Will they have lots of energy?
- If Guzzler didn't eat his breakfast, how do you think he would feel?
- Have you ever forgotten to eat breakfast or not had time to eat your lunch/snack? How did you feel?
- Is it important to eat breakfast? Why?
- What does food give you?

Think, pair, share

- What kind of things do you think Guzzler and Alina like to do with all their energy they get from food?
 - What kind of things do you like to do when you have lots of energy?
 - Why is it important that we have plenty of energy?
-



Investigate: Working on the enquiry

Key learning experience

At the end of the story, Guzzler, Alina and friends dance at the Energy Party.

Whole-class discussion

- Do you like to dance?
- What songs do you like to dance too?
- Do you think Guzzler and Alina have energy for dancing? Why?

Investigation (can be done outside or in a large hall)

→ Set the context

Explain to the children that we are going to have a dance party now, just like everyone at the energy party. But before we start the dance party, we're going to 'eat' our breakfast again to make sure we have enough energy! However, not everyone will eat the same amount of breakfast.

Put all the Wheat biscuit cards in a bag and invite each child to pick a card out at random (see appendix 1)

→ Predict

In their groups, discuss who they think will have the most energy for dancing after eating their 'wheat biscuit' breakfast? Why do you think that?

→ Investigate

Get the class to suggest a song to dance to. Explain that when you first stop the music, those who 'ate' only 1 wheat biscuit should sit down; when you stop the music the 2nd time, those children who 'ate' 2 wheat biscuits should sit down and when the song finishes, those who 'ate' 3 wheat biscuits should sit down.

→ Discuss

- How tired does everyone feel?
- Who feels most tired?
- Explore that those who danced for longer used up more energy and so may feel more tired.
- What could we do now to give us more energy?
- What are wheat biscuits made from?
- Do you know what other breakfast cereals are made from?

Discuss with the children how wheat biscuits are made, connecting that the wheat is food which has come from a plant. Encourage the children to make connections with other breakfast cereals made from grains.



Take the next step: Digging deeper

Applying learning

Using the template provided, ask the pupils to design (draw) a healthy lunch that will give them energy for a busy afternoon in school. (see appendix 2).

Making connections

Further connect to SPHE curriculum by exploring food preferences and their role in a balanced diet



Theme 1c: Energy to move things!

Curricular area	Science	Maths	
Strand	Energy and Forces	Measures	Data
Strand unit	Forces	Length	Recognising and interpreting data
The children should be enabled to:	<p>Explore, through informal activity with toys, forces such as pushing and pulling (J, S)</p> <hr/> <p>Explore how objects may be moved by pushing and pulling (1, 2)</p> <hr/> <p>Investigate how forces act on objects (J, S, 1, 2)</p>	<p>Select and use appropriate non-standard units to measure length (S)</p> <hr/> <p>Estimate, compare, measure and record length using non-standard units (1, 2)</p>	<p>Represent and interpret a set of simple mathematical data using real objects, models and pictures (J)</p> <hr/> <p>Represent and interpret data in two rows or columns using real objects, models and pictures (S)</p>
Skills	Investigating; Measuring; Recording and communicating	Communicating and expressing; Integrating and connecting	
Target language	Force, fuel, energy, push, pull, length, longer, shorter, non-standard units		
Key learning	A force acts on an object to move it. Energy is needed when a force causes an object to move.		
Resources	Selection of toys that move for each group, larger wheeled car for investigation, plasticine (or similar), non-standard measures		



Engage: Getting started

Generate – set the context

In the story, we see Guzzler and Alina going to school.

Questions to promote discussion

- How are Guzzler and Alina travelling to school?
 - Do they look like they are enjoying it?
 - What way do you travel to school?
-

Wonder and Explore – find out children's ideas through questioning and discussion

Whole-class discussion

- How does Guzzler get energy to scoot?
- What is Alina's fuel that gives her energy to cycle?
- What other kinds of vehicles or modes of transport do we see in the story?
- What kind of fuel or energy do they need to move?
- What do all these need to move?

Think, pair, share

- What are the different ways we can move things?

Free play

Give each group a simple collection of toys and let them explore how they move e.g. wind-up toys, cars that you pull back, wheeled cars, magnetic cars, remote-control car. How can we move each car?



Investigate: Working on the enquiry

Key learning experience

Investigation

→ Set the context

In the story, Guzzler travels on a scooter.

- What do you think will happen if Guzzler does a bigger push off the ground with his foot?
- How can you make yourself go further on your scooter (or bike)?

→ Predict

In your groups discuss if you think that pushing a toy car with more force will make it go further? Why do you think that?

→ Investigate

On a flat surface either inside or in the school grounds, support the children to carry out an investigation exploring if pushing the same car with more or less force causes it to travel a longer or shorter distance. Encourage use of non-standard measure to compare.

→ Discuss

Encourage use of mathematical language in discussion

- What did you find out?
 - Was it easier or harder to make the car move a longer distance?
 - Was it easier or harder to make the car move a shorter distance?
-



Take the next step: Digging deeper

Applying learning

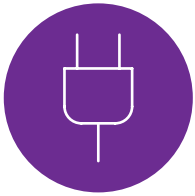
To explore the concept further that energy is needed to move vehicles, children could investigate which takes more energy – pushing 4 vehicles each with 1 person in them or pushing one vehicle with 4 people in it? Use plasticine (or similar) to add 'people' to the same car (connect to idea of fair test as appropriate for the ability of the children) and test. Children should explore the force needed to move these different vehicles. Again this can be done inside or outside the classroom.

Making connections

Make a line either with rope or with chalk outside. Invite the children to share the different ways they travelled to school that day. Then draw a picture with chalk or write the word of each of the different ways that children travelled to school along the rope or chalk line and invite the children to make a human graph. Some children can represent this information pictorially in columns or rows in one-to-one correspondence afterwards. Depending on the prior knowledge and experiences of the class, you could begin to discuss which is more environmentally friendly.

Questions

- What was the most popular way to travel to school today?
 - What was the least popular way?
 - Which ways are good for the environment? Why?
-



Theme 2: Renewable and non-renewable sources of energy

Fossil fuels consist of fuels such as coal, gas and oil, including petrol and diesel. These are non-renewable as they took millions of years to form in the earth and therefore will not renew once we have used them up. They are finite.

Background knowledge for teachers

In **theme 2a**, Guzzler and Alina pass by cars and buses on their way to school. Most of our vehicles run on fossil fuels which are extracted from the earth. Fossil fuel extraction, such as mining coal, leaves permanent scars on the earth as well as causing other problems such as water pollution, habitat damage and the production of solid waste. They are also finite and running out - they are non-renewable sources of energy.

In **theme 2b**, solar energy is explored as an example of a renewable resource. Recording temperature is also introduced in this theme. Temperature is the measure of how hot or cold something is. Solar energy can be used to heat things up and doesn't harm the environment like when we burn fossil fuels for heating or generating heat.

In **theme 2c**, the concept of insulation is explored. We use energy to heat our homes and schools and so it is important to keep that heat in the room or building so we are not wasting energy. Insulation, including wall insulation, helps to stop the transfer of heat. Here children will explore how they can reduce the transfer of heat from the sun on a sunny day to their cool ice cream!

For further information and theme ideas on renewable and non-renewable resources, see [Energy in our Lives](#) in the SEAI schools' resources.



Theme 2a: Non-renewable energy – Fossil fuels

Curricular area	Science/Geography	History
Strand	Environmental awareness and care	Story
Strand unit	Caring for my locality	Stories
The children should be enabled to:	<p>Appreciate that people share the environment with plant and animal life (J, S)</p> <hr/> <p>Become aware of ways in which the environment can be polluted or harmed (1, 2)</p>	Listen to local people telling stories about their past (J, S, 1, 2)
Skills	Predicting, observing, investigating	Time and chronology, using evidence
Target language	Non-renewable energy, fossil fuel, habitat, environment	
Key learning	Fossil fuels were plants or animals a long, long time ago that are buried deep in the earth. They are full of energy and we can burn them to make things warm or make them move.	
Resources	Pack of chocolate chip biscuits, toothpicks (or something similar), images of mining and drilling for fuels, images of different modes of transportation over time (appendix 3)	



Engage: Getting started

Generate – set the context

In the story, Alina and Guzzler pass by cars and buses when they are cycling and scooting to school.

Questions to promote discussion

- What way do you travel to school?
 - What different types of public transport are in our community?
 - What kind of fuel is used in cars?
 - How are our buses/trains/trams powered?
-

Wonder and Explore – find out children's ideas through questioning and discussion

Whole-class discussion

- What different kinds of fuels do you know?
- Where do these fuels come from?
- Do you know what these fuels are called?

The term fossil fuel should be introduced here if it is not elicited from the children.

Think, pair, share

We have been encouraged to walk/scoot/cycle more when we can and use public transport rather than our own cars – why do you think we have been told to do this?

Link to 'Walk on Wednesdays' or the 'Walking bus' or 'Bicycle train' initiatives relevant to your school or area.



Investigate: Working on the enquiry

Key learning experience

We are going to explore a little more about fossil fuels now. Each child is going to have a chocolate chip biscuit and a toothpick (or something similar)

Teacher directed task (can be done outside)

→ **Set the context**

Imagine that this biscuit is part of the earth and the chocolate chips are the fossil fuels. We are going to act like miners to try and dig out the fossil fuel.

→ **Predict**

What do you think will happen to the biscuit? Will it be easy to take out the chocolate chips without damaging the biscuit? If we take out all the fossil fuel, will more appear?

→ **Investigate**

Give time for each child to 'mine' their biscuit

→ **Discuss**

Discuss with the children what happened to the biscuit when they mined for the chocolate chips.

By taking the chocolate chips from the biscuit, the biscuit is changed. Similarly, when we mine fuels from the earth, this changes the earth around the fuel and this can have a bad effect on the plants and animals that live there and their habitats. Also, once the chips are gone, they are gone. They are non-renewable.

Some images of mining or drilling for fossil fuels would help develop their understanding here.



Take the next step: Digging deeper

Applying learning

In Ireland, we have 2 types of fossil fuels that we still 'mine' – peat and natural gas. Children could examine some photos or videos of our peat bogs and some simple evidence could be shared about the damage caused to ecosystems as a result.

One of the ways we use fossil fuels is to create heat for our homes and electricity to power so many things that we use day to day! (Theme 3a explores this further)

Making connections

Explore through pictures or videos, how transport has changed over time.

Collaborative group work

Invite the children to discuss and sequence pictures in chronological order e.g. horse and cart, bicycle, bus, steam train, diesel trains, cars, electric trains/trams etc.

Print one copy of Appendix 3 for each group. Cut out the cards and place in an envelope or tub for each group.

Discussion

- Where does the energy come from in each picture to move each vehicle?
- Are any of these powered by fossil fuels?
- Where else do we use fossil fuels today?

This leads into Theme 3 – electricity!



Theme 2b: Renewable energy – Solar (Sun)

Curricular area	Science	Primary Language Curriculum
Strand	Energy and forces	Writing; Exploring and using
Strand unit	Light	Purpose, genre, and voice
The children should be enabled to:	<p>Discuss differences between day and night, light and shade (J, S)</p> <hr/> <p>Recognise that the sun gives us heat and light, without which we could not survive (1, 2)</p>	<p>Draw and write with a sense of purpose and audience while creating texts in a range of genres (J, S, 1, 2)</p>
Skills	Predicting, observing, investigating, recording	
Target language	Renewable energy, non-renewable energy, solar power, wind power, shade, light, thermometer, temperature	
Key learning	Renewable energy is better for the environment as it uses renewable sources e.g. wind and sun energy	
Resources	Animations of wind farms and solar panels (see appendix 4 or locate a windfarm in your locality); containers, water, thermometers;	



Engage: Getting started

Generate – set the context	<p>In the story, Guzzler and Alina remember about their school trip to the wind farm.</p> <ul style="list-style-type: none"> – How anyone seen one? – Do you notice what is on the roofs of the shops outside Alina's school?
Wonder and Explore – find out children's ideas through questioning and discussion	<p>Questions to promote discussion</p> <ul style="list-style-type: none"> – Who knows what a wind farm is? – What does a wind turbine do? – Have you seen a solar panel? – Do you know what a solar panel is?



Investigate: Working on the enquiry

Key learning experience

Here we will explore how sun energy, a renewable energy source, can be used to heat things up.

Investigation

→ Set the context

- Have you ever been on the beach on a hot, sunny day and the sand has been really hot? Have you got into a paddling pool and the water has been cold only for it to warm up in the sun later?
- Do you think that sun (solar) energy can be used to heat things up?
- Why do you think that?
- Do you know what temperature means?
- Do you know how to measure temperature?
- If we had 2 containers of water, and we placed one in direct sun on a sunny day and the other in the shade, do you think their temperature (how hot or cold they are) would change?

→ Discuss and predict

Which container of water do you think will be warmer, the one in the sun or the one in the shade? Why?

→ Investigate

Here are some questions to help plan the investigation:

- Is it important to check the temperature of the water in each container first?
- Should we have the same amount of water in each container?
- Should we use the same type of container?
- Should we leave them out for the same amount of time?
- How will we record the temperature change?

→ Record

A simple table can be used to record the change in temperature over time for each container. This could be done as a class on the IWB.

→ Discuss

- Was there a difference between each container?
- Did one change more than the other?
- Why do you think this?
- Did you notice anything else?

Solar energy heated up the water in the window



Take the next step: Digging deeper

Applying learning

In the case of solar and wind energy, we call these renewable energy sources.

Discussion

- What does renewable mean?
- Why are these renewable energy sources?
- What does non-renewable mean?
- What are examples of non-renewable sources of energy?
- Do you think it is better to use renewable or non-renewable sources of energy? Why?
- Does anyone have solar thermal panels on their homes? Solar thermal panels are used to heat water for use in our homes.

Making connections

Connecting to the locality

Explore the local area to see if there are any solar panel in the locality, if so, show images of them to the children (assuming they are not close enough to see or visit).

There are different types of solar panels; solar thermal which use solar energy to heat water and solar PV (photovoltaic) which convert solar energy into electrical energy.

What kinds of solar panels are they?



Theme 2c: Insulation

Curricular area	Science	Geography
Strand	Energy and Forces (J, S)	Writing; Exploring and using
Strand unit	Materials (1, 2)	Natural environments
The children should be enabled to:	<p>Identify ways of keeping objects and substances warm and cold (J, S)</p> <hr/> <p>Explore ways in which liquids and solids may be kept hot or cold (1, 2)</p>	<p>Discuss the suitability of different kinds of clothes for different weather conditions (J, S)</p> <hr/> <p>Identify ways in which weather influences the lives of people (1, 2)</p>
Skills	Predicting, observing, investigating, recording	Recording and communicating
Target language	Fossil fuel, environment, insulator, warm, cold, temperature	
Key learning	Some materials are good insulators, they help to keep the temperature the same	
Resources	Various materials, wrapped ice creams (or just an ice cube in a small bag)	



Engage: Getting started

Generate – set the context	In the story, Alina closes the door to her bedroom to keep the heat in and the cold out in winter. Why do you think she does this?
Wonder and Explore – find out children's ideas through questioning and discussion	<p>Questions to promote discussion</p> <ul style="list-style-type: none"> – How are your homes heated? – Have you radiators in your house? – Have you an open fire? – When the heating is on or the fire lit, do the grown ups in your house have to remind you to close doors to keep the heat in? – Why do you think it is important to close the doors when the heating is on? <p>Closed doors and windows as well as the walls all help to keep the heat in the room. They act as insulators. Insulators are materials that reduce the transfer of heat. Insulators don't just keep things warm, they can also keep things cool.</p>



Investigate: Working on the enquiry

Key learning experience

Investigation

→ **Set the context**

It is lovely sunny day and you have a wrapped ice cream but you can't eat it until you get to the park. How can you keep it from melting?

The children should be guided through the working scientifically process, starting with the children coming up with their specific question.

Which material do you think will be best for keeping the ice cream from melting?

→ **Explore and predict**

Provide the children with a variety of materials to explore using their senses.

→ **Investigate**

Allow the children in groups to devise a simple investigation to test different materials. Depending on the age and stage of the children, a comparison of 2 materials may be sufficient. They can then sort the materials into ones that will keep the ice cream from melting and ones that won't. They can record their results through drawings or by taking photos.

→ **Discuss**

- Which materials was the best/worst at keeping the ice cream from melting?
- Was this the same as what you predicted?
- What did you find most exciting or interesting?

The best material insulated the ice cream, keeping the cold in (slowing down the transfer of heat)



Take the next step: Digging deeper

Applying learning

In the story, Alina closing her door keeps the heat in her room and the cold out! The door acts as an insulator.

Think, Pair, Share

- What other things act as insulators keeping the heat in (and the cold out) in your homes in winter?
- What other things do we wear to keep warm in winter?

Investigation

The children could observe and sort a selection of clothes into clothes that we wear when it is cold and when it is hot and discuss their different properties.



Making connections

Questions to promote discussion

- Can you think of other things that we use to help keep the temperature of food the same?
 - When you go on a picnic, how are the food and drinks kept cool?
Or on a wintery walk in the woods, how is your hot drink kept warm?
 - Some children may use thermos flasks for their lunch, they could be invited to share and talk about how it keeps their lunch warm (or cold)!
-



Theme 3: Electricity

Electricity is the movement of electrons between atoms. This can occur naturally, such as in lightning, or it can be generated. Much of our electricity is generated by turbines, which are powered by fossil fuels, such as coal. Unfortunately, when we burn fossil fuels to generate electricity, gases are released that are harmful to the environment and warm our planet. However, electricity can also be generated using renewable forms of energy such as solar and wind energy, and these don't harm the environment.

Background knowledge for teachers

In **theme 3a**, Guzzler and Alina use the oven to cook their pizza for the party. We learn that energy is needed to power many items in our homes and schools. When we turn these items off, there is no longer a flow of current and therefore no energy is being used which means energy is not being wasted and harmful gases from the burning of fossil fuels to generate the electricity are not being added to the atmosphere.

In **theme 3b**, we explore a renewable source of energy – the wind – to generate electricity instead of fossil fuels! Guzzler and Alina visited a wind farm on a school trip. Here we will see how wind energy can move things and generate electricity.

For further ideas and resources on temperature, see [Energy Science](#) for the infant classes or [Heat and Temperature](#) for First and Second class.



Theme 3a: Electricity in our daily lives

Curricular area	Science	Primary Language Curriculum
Strand	Energy and forces	Oral Language: Exploring and using
Strand unit	Magnetism and electricity	Categorisation
The children should be enabled to:	<p>Become aware of the uses of electricity in school and at home (J, S, 1, 2)</p> <hr/> <p>Identify some household appliances that use electricity (J, S, 1, 2)</p>	Name, describe and categorise objects of increasing complexity, demonstrating growing depth of knowledge and improved understanding (J, S, 1, 2)
Skills	Predicting, observing, investigating, recording	
Target language	Electricity, appliance	
Key learning	We rely a lot on electricity	
Resources	Electricity hunt worksheet (appendix 5). Photos of inside of homes in the past (appendix 6).	



Engage: Getting started

Generate – set the context	In the story, we hear that we need energy to power our lights, fridges, ovens, toasters, kettles and all our screens. Alina reminds us to turn off the lights when we are not using them to save energy.	
Wonder and Explore – find out children's ideas through questioning and discussion	<p>Questions to promote discussion</p> <ul style="list-style-type: none"> – What other things in your homes use electricity? – Where does this 'energy' come from? – Why do we want to save energy? 	Fossil fuels are currently one of the largest sources for generating electricity (Theme 2 explores why fossil fuels are not a good choice)



Investigate: Working on the enquiry

Key learning experience

Investigation

→ Set the context

Imagine when you come into school there is no electricity, do you think the school day would be very different? In the last few years, some primary schools in Ireland have had to close the school when there was no electricity following a storm.

→ Questions to promote discussion

- Why do you think schools had to close when there was no electricity?
- What things in our classroom use electricity?
- What things in other parts of the school use electricity?

→ Predict

Which room do you think will have the most or least electrical items in it? Why?

→ Investigate

The children should do an electricity hunt around the school to try to observe as many items as they can that use electricity.

→ Record

They can record their findings using their preferred choice; photos, drawings, writing/list etc. or use the attached worksheet (see appendix 5).

→ Discuss

Through discussion the children can name, describe and categorise items in each room that use electricity.

- What is the electricity used for? Heating, lighting, powering devices?
- Which room(s) in the school has the most things that used electricity?
- Which room use the least?
- What surprised you?
- What items do you think use more energy?

Think, pair, share

So what do you think now about a school day with no electricity?



Take the next step: Digging deeper

Applying learning

Encourage the children to do a similar activity at home, making a note of items in the living room, kitchen and bedroom that use electricity.

Discuss how important electricity is in our day to day life.

What are some of the things they can do to reduce how much energy we use?

Making connections

In history, show photos of homes in the past/ items from the home (see appendix 6 for examples).

Questions to promote discussion

- What type of lighting was used?
 - How did they cook their food?
 - Did they have televisions or computer games?
 - How did they listen to music?
-



Theme 3b: Generating electricity from energy – Wind

Curricular area	Science	Aistear: the Early Childhood Curriculum Framework
Strand	Energy and Forces	Theme: Exploring and thinking
Strand unit	Forces	Aim 1: Children will learn about and make sense of the world around them.
The children should be enabled to:	Investigate how forces act on objects (J, S, 1, 2)	Engage, explore and experiment in their environment and use new physical skills including skills to manipulate objects and materials
Skills	Design and make	
Target language	Wind energy; renewable energy, generate electricity	
Key learning	Wind has energy and can move things – wind energy is a renewable form of energy and we can use it to generate electricity	
Resources	Various materials to make sails, scissors, glue, range of containers to make the boat, sticks/straws to mount the sail; range of materials to make the windmills, photos of car e-charging point (appendix 7)	



Engage: Getting started

Generate – set the context	In the story, something blows Guzzler's party hat off his head. Questions to promote discussion What do you think it was? How do you think the wind blew the party hat off his head?
Wonder and Explore – find out children's ideas through questioning and discussion	Whole-class discussion – What other things have you seen the wind move or blow? – Have you ever felt the wind trying to move you? Or blown something away that you were carrying? – What can you see out of the window when Guzzler and Alina are in the library? – What is helping the sailing boats move?



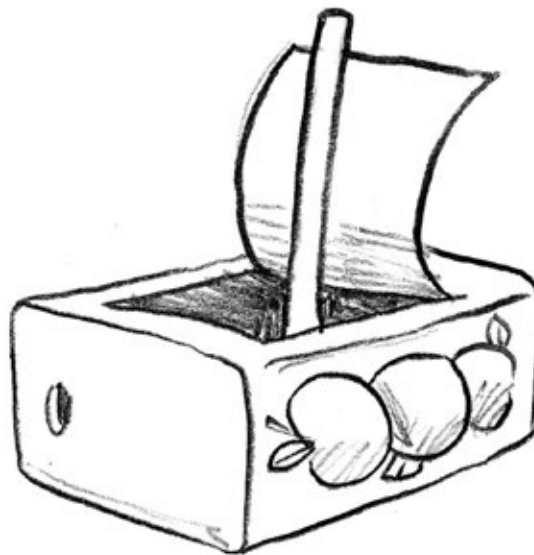
Investigate: Working on the enquiry

Key learning experience

Design and Make

In line with the design and make process, give the children an opportunity to **explore** different materials which they could use to make a sail for a boat. Encourage them to think about shape and size of their sail. Make connections to sails they have seen on boats or have some pictures on the IWB. Then they should **plan** by imagining and suggesting a possible boat they could make. Offer them a range of materials (use recycled materials where possible eg milk or juice box, plastic containers, straws). Encourage them to talk about their plan. They then should try to **make** their wind powered boat using a range of tools and developing their craft handling skills, as appropriate. Finally, the children should test out whether their boats can be moved by the wind. This could be done outside on a windy day in a large bucket! They can then **evaluate** their boat by talking about it and reporting on what was done.

This investigation could take place over a couple of lessons as appropriate for the age and stage of the children.





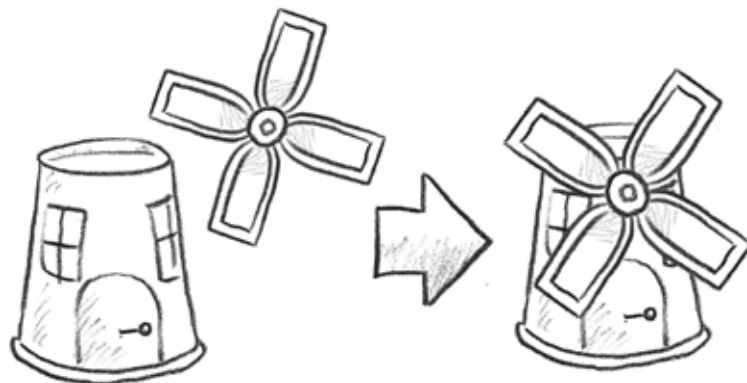
Take the next step: Digging deeper

Applying learning

Similar to the previous investigation, the children should be given opportunity to follow the design and make process to make a simple windmill. Initially, they should **explore** different materials which they could use to make blades for their windmill. Encourage them to think about shape and size. Have some pictures for them to look at to give ideas. To maximise success, it might be useful to have some simple ones already made. Then they should **plan** by imaging and suggesting a design for their windmill. Again, offer them a range of materials (use recycled materials where possible e.g. cardboard from cereal boxes, plastic cups). Encourage them to talk about their plan. They then should try to **make** their windmill using a range of tools and developing their craft handling skills as appropriate. Finally, the children should test out their windmills and **evaluate** their windmill by talking about it and reporting on what was done. This investigation could take place over a couple of lessons as appropriate for the age and stage of the children.

An idea for a simple windmill is included [here](#)

Other ideas are shown below.



Making connections

Show photos of e-car charging points (see appendix 7) at super markets or other public places. Explore with the children what they know about these.

Questions to promote discussion

- Does anyone know what these are?
- Does anyone have a e-car at home?
- What does the e-stand for?
- How do e-cars get their energy?

Instead of using fossil fuels like diesel and petrol, these cars use electricity to get their energy. When the electricity has been generated from renewable sources, like wind and solar, this is really great for the environment.

Invite the children to create a poster to share what they have learned about renewable and non-renewable sources of energy for display in the school. Pupils could draw a picture of a renewable energy technology (wind turbine or solar panels) and explain why they think this is a good energy source. Older children can write a sentence on their poster.



Theme 4: What can we do – Reduce, Reuse, Recycle!

Here we consider the kind of actions that children can take in their homes, schools and communities to contribute towards saving energy and protecting our planet. While recycling is important as a climate action, reducing and reusing often have a bigger impact. Reducing our use of items and reusing items are more effective as these actions do not have associated energy costs, keep products and materials in use for a longer time and minimise the amount of waste we create. Recycling requires energy in terms of both transport and processing and many items can only be recycled a number of times meaning that the material will eventually end up in landfill.

Background knowledge for teachers

In **theme 4**, the different kinds of simple actions we can take to reduce energy are explored. Actions such as turning off electrical appliances and lights, turning taps off and not using hot water when we don't need it or having shorter showers, keeping doors/windows closed, using reusable items like drinks bottle and shopping bags and buying less as energy goes into making, transporting and disposing of things.

Reusing and recycling are explored. Understanding what can be recycled and composted is important and correct separation of materials is necessary prior to disposal. Reusing items, both at home and at school, helps us to think differently about consumption and to consider when and if we need to buy new items.

Recycling, reducing and reusing are part of a sustainable approach to life which includes saving energy and water also. For opportunities to extend on these themes, see [Saving Energy](#) for the Infant Classes or [Saving Energy and Water](#) for First and Second classes.



Theme 4: Reduce, reuse, recycle

Curricular area	Science/Geography	SPHE
Strand	Environmental awareness and care	Myself and the wider world
Strand unit	Caring for my locality	Developing citizenship; Environmental care
The children should be enabled to:	Identify, discuss and implement simple strategies for improving and caring for the environment (J, S, 1, 2)	Appreciate the environment and realise that each individual has a community and individual responsibility for protecting and caring for the environment.
Skills	Compost, decompose, natural, manmade	
Target language	Reduce, reuse, recycle, Natural items will decompose and are generally suitable for composting; recycling rainwater saves energy	
Key learning	Frame for 'ways to save energy' (see appendix 8), space to 'plant' a range of waste items (some natural, some manmade), trowel for digging; large plastic milk container (ideally 3 litre one with handle), garden twine or cable ties, art materials/paint to decorate water butt if desired.	
Resources	Electricity hunt worksheet (appendix 5). Photos of inside of homes in the past (appendix 6).	



Engage: Getting started

Generate – set the context	<p>In the story, there are lots of examples of how Alina and Guzzler are reducing, reusing and recycling.</p> <p>What are the different ways Guzzler and Alina reduce, reuse and recycle in the story?</p>
Wonder and Explore – find out children's ideas through questioning and discussion	<p>Questions to promote discussion</p> <ul style="list-style-type: none"> – What does reduce mean? – What does reuse mean? – What does recycle mean? – Is it better to reduce or recycle? – What things do we already do in the classroom to reduce, reuse or recycle?



Investigate: Working on the enquiry

Key learning experiences

Investigation 1

Following on from the discussion of what Alina and Guzzler do in the story, the class are invited to create their own list of actions they can take to reduce, reuse and recycle.

This could use the suggested frame in Appendix 8, or come up with their own way to record.

The class could take a visit to their local main street and do an investigation of things the community could do.

Investigation 2

→ Set the context

In the story, in the classroom we see there is a bin with 3 sections. Can you guess what these sections are for?

→ Questions to promote discussion

- What kind of bins do we have in the classroom?
- Why do we have these different bins?
- Why is it important to compost?
- Why can only some things be composted?
- How are we reducing energy by composting?

→ Investigate

The children should choose 4 waste items (3 manmade waste items e.g. foil, paper, plastic, and 1 natural waste item e.g. apple core, banana skin) and plan an investigation to see which will decompose quickest

No processed/cooked/dairy/meat food items as these might attract vermin

→ Record

They can record their findings using their preferred choice; photos, drawings, writing.

→ Discuss

Through discussion the children can explore which items are most suited to composting and which aren't

- What items had begun to (or had fully) decomposed?
- What items had not changed at all?
- What surprised you?

When the compost is ready, use this as soil to help plants grow (rather than buy new soil)! A great way to reduce and recycle. The more we put in the compost bin, means less going to landfill!

Investigation 3

→ **Set the context**

In the story, in the garden we see there is a water butt beside where Guzzler and Alina are doing some planting.

→ **Questions to promote discussion**

- What is a water butt?
- Why do you think these might be good for the environment?
- How are we reducing energy?

→ **Design and make task**

For this activity, in groups the children can make their own water butts using milk containers. Firstly, they need to make sure the label is removed from the milk bottle and rinsed to remove any milk. Then, with the help from teacher, the base should be cut off (as close to the bottom as possible). Finally using cable ties or twine, it should be tied with the lid facing down to tie it firmly into place on a fence or post in the garden / outdoor area.

Next time the plants need watering, they can use water from the water butt by taking the lid off and filling their watering can.

→ **Discuss**

Through discussion the children can explore how this saves energy

Cleaning water to make it good enough to drink uses a lot of energy, so by reusing rainwater instead of tap water to water our plants, it means that we're helping to save energy and look after our environment.



Take the next step: Digging deeper

Applying learning

Invite the children to do an energy audit of the school/classroom – what is 'on' that shouldn't be! How could they encourage their peers and teachers to use energy more wisely?

Encourage the children to do a similar activity at home.

This could link with the schools monitoring and reporting of energy data. If possible they could check the school's meter one week and then compare to another week when they are being energy savers.

Making connections

Take a trip to the local village/town. The children could bring some cameras/tablets to take photos of things that are being reused/repurposed/recycled. Make a collage of the photos back in the classroom to celebrate what their local community is doing. They may also have suggestions for more things that could be done!

Appendix 1



One Wheat biscuit



One Wheat biscuit



One Wheat biscuit



Two Wheat biscuits



Two Wheat biscuits



Two Wheat biscuits



Three Wheat biscuits



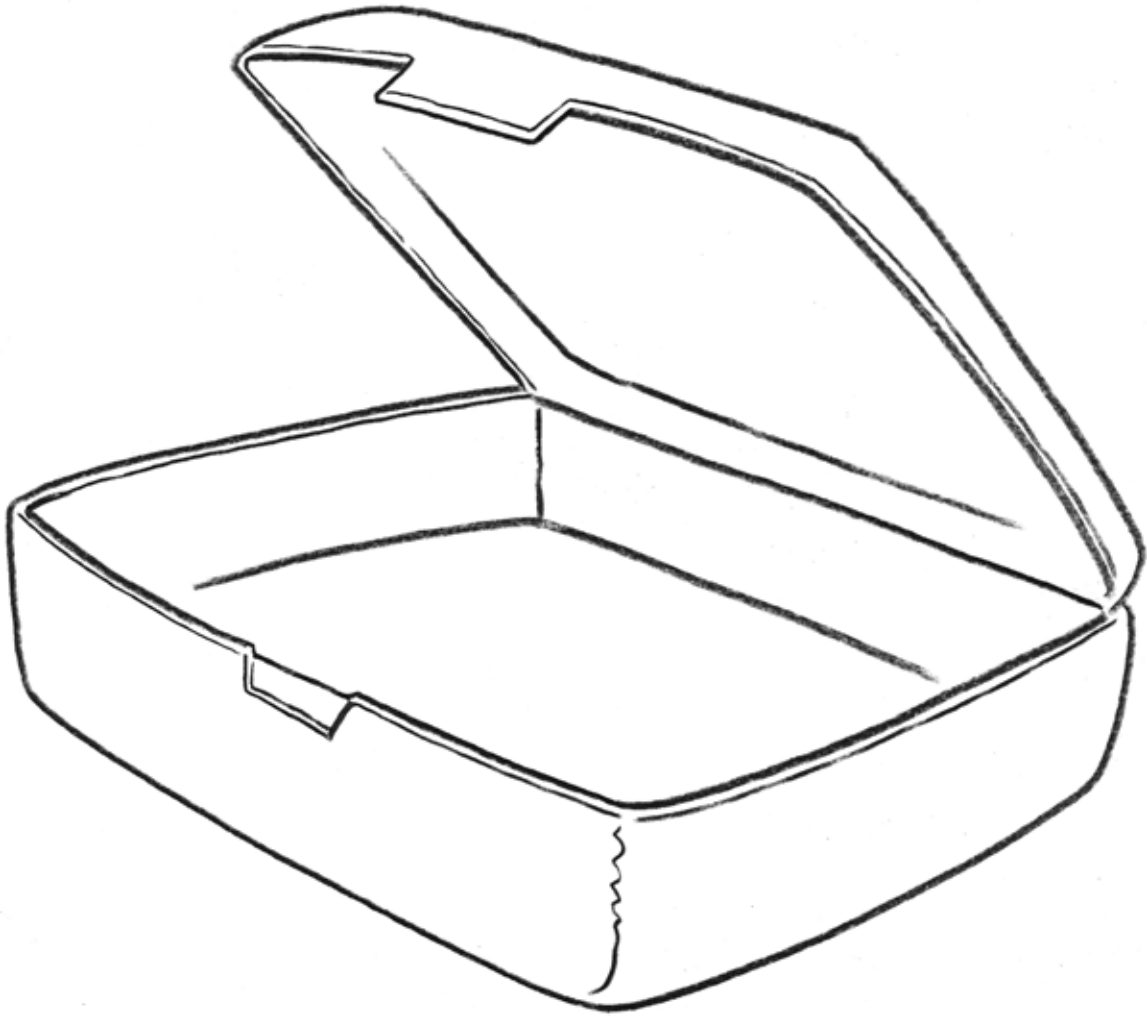
Three Wheat biscuits



Three Wheat biscuits



Appendix 2



Appendix 3

Provide a selection of cards with illustrations of various modes of transport through the ages.



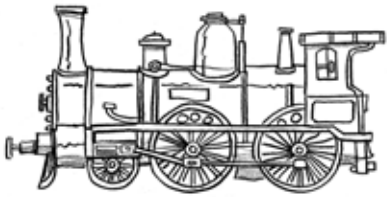
Horse and cart



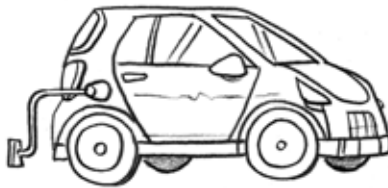
Car from 1900s



Car from the 1970s



Steam engine



Electric car



Modern bicycle



Scooter



Tram



Bicycle from early 1900s

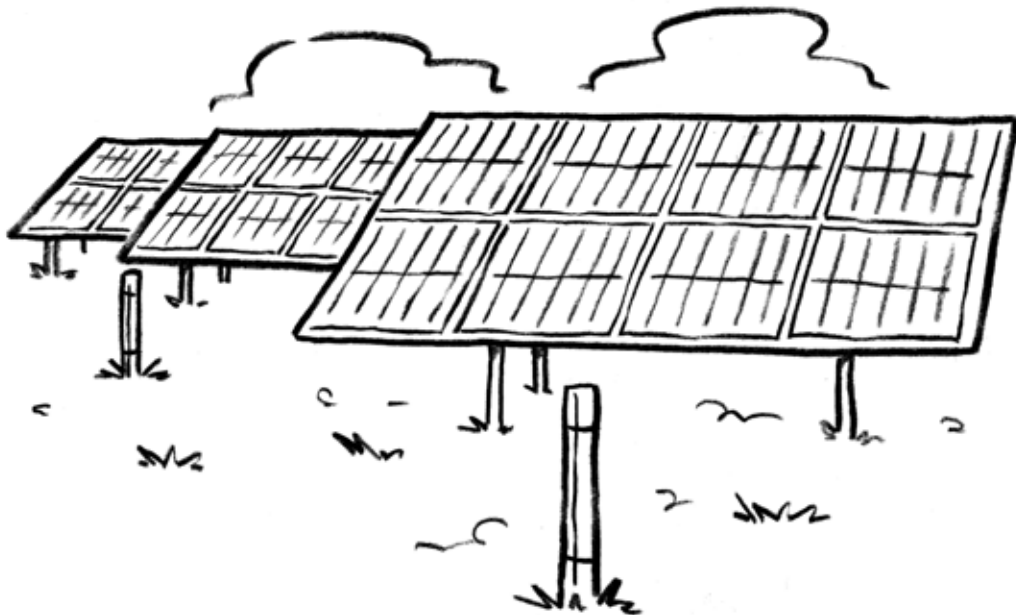


Appendix 4

Wind farm



Solar farm



Appendix 5

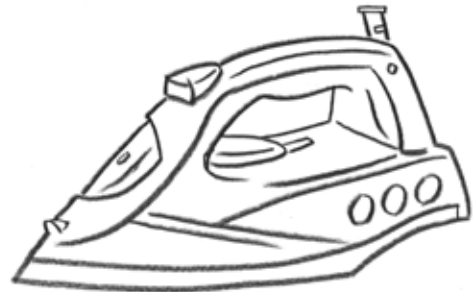
Electricity Hunt: see how many items you can find in each room that uses electricity.
Write them in each box or draw a picture.

<p>Our classroom</p>	<p>The hall</p>
<p>The office</p>	<p>Other room</p>



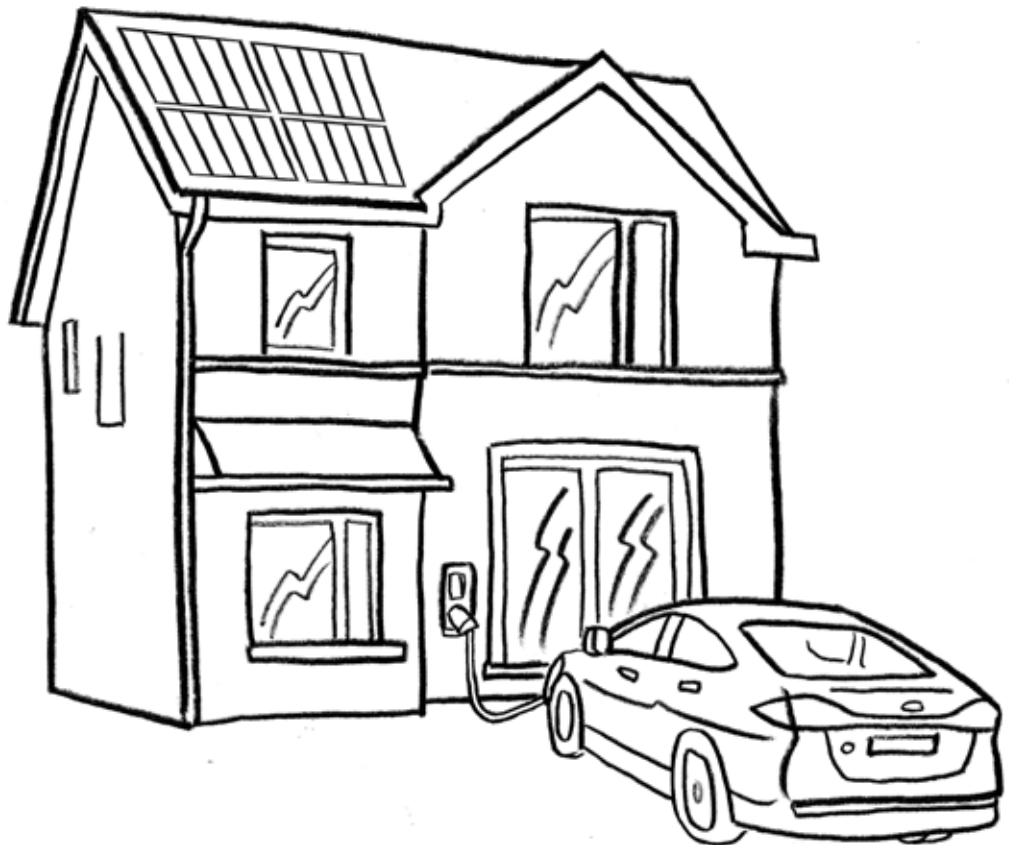
Appendix 6

Our homes and appliances in the past and present.



Appendix 7

An electric car charging point.



Appendix 8

What can we do... in our home, school, community

<u>Reduce</u>	<u>Reuse</u>	<u>Recycle</u>



Guzzler's Glossary

ALINA is a girl's name. It means bright, shining and kind.

CLIMATE ACTION is what children, adults, communities and countries can do to protect the environment.

CLIMATE CHANGE is what is happening to our planet, Earth. It is getting hotter and this changes our weather and climate. It is not good for plants, animals and us now or in the future.

COMPOSTING means letting worms and other small animals, as well as other living things that we can't even see, turn things that were plants into compost. Compost is great for growing plants and is peat free.

ENERGY is the power to move and do things.

ENVIRONMENT is the surroundings, natural and built, where people, animals and plants live together.

FOSSIL FUELS are things that were plants or animals a long, long time ago. They are full of energy and we can burn them to make things warm or make them move. Coal, gas, oil, petrol and peat (turf) are fossil fuels. Some of our electricity is made by burning fossil fuels. But they are running out and using them causes **CLIMATE CHANGE** so we need to use an alternative and use less.

GLOSSARY means list of words and what they mean!

GUZZLER's name means something that uses or eats a lot.

INSULATION is a material that is used to keep heat in or out of something.

POLLINATION is how pollen is moved from one plant to another by insects, birds and other small animals or by the wind, to make new seeds.

RECYCLING means using things again by making them into something new.

REDUCING means trying to use less of things.

RENEWABLE ENERGY is energy that is made from something that doesn't get used up. Like energy from the wind, sun and water.

REUSE means to use something again or to pass it on to others who could use it.

SOLAR means something about the sun.

SOLAR ENERGY is energy from the sun.

About Sustainable Energy Authority of Ireland

SEAI's mission is to be at the heart of delivering Ireland's energy revolution. We are a knowledge-led organisation that drives the reduction and replacement of fossil fuel usage. We partner with citizens, communities, businesses and Government and are trusted collaborators, innovators, funders and educators.

SEAI's education and youth programme supports schools across Ireland to help children learn about sustainable energy and climate change by providing curriculum linked resources and workshops.

Year first published 2023



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