



GreenHome

Level: Junior and Senior infants

THEME: ENERGY 'Energy and Us!'

Objectives/Tasks

Students learn (S=session)

S1: Energy

- That energy gives us the power to do our days work
- Animals and plants use energy too



S2: How does food get its energy? (Drama)

- The sun is the biggest source of energy on earth

S3: Sunlight energy

- Plants need the sun to grow - (students observe bean seeds do not grow without sunlight/ or at a reduced rate)
- People use their energy to care for plants - (students grow and care for hairy heads)

S4: Electricity

- Appliances use electricity as a source of energy
- Electricity is made in power stations

S5: Wind

The wind is a source of energy

- To make a wind detector to test for wind
- To draw a diagram of the windiest spot in the school



S6: Energy vampires & Standby Power

- That appliances need to be turned off at the switch and not left on standby

Curricular strands

SESE-Science & Geography Environmental awareness and care

SESE-Science-Skills-Designing & making: Exploring/Planning/Making/Evaluating

Science-Magnetism & Electricity

Drama-Drama to explore feelings, knowledge and ideas, leading to understanding

Does anybody know what energy is? Mini brainstorm
(Formal definition: Energy is the ability to do work.)

- Energy makes it possible to run, jump, hop and play.
- It gives us the power to complete activities all day. It's fun to have energy!



What kind of work do you do in your day?

School work? Chores? Skip, jump, laugh, eat and play?



Brainstorm all the types of work people do in day

-What kind of work do animals do? (For humans and for themselves) -What kind of work do plants do?

Brainstorm all the types of work animals and plants do in their day.

- **Animals**
Animals (hunt/eat/build homes/look after their young/fight against predators)
Animals do work for us (bees make honey & pollinate flowers, horses carry people, oxen pull ploughs (help in farming)).
- **People**
People (play sport, dance, write, sleep, eat, cook, work & build houses)
- **Plants**
Plants (grow; provide food for humans & nectar for bees to make honey)



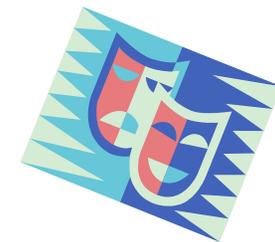
People need animals and plants to complete their work.

Plants and animals need humans to take care of them. We all need each other.

(This information provides the background for caring for plants and the energy chain drama)

Acting time! Guess the work being done:

- **Energy Charades Card game.** Use the flash cards provided: students act out a picture.
The class guesses what work is being acted out. (E.g. Plant growing, dancing, hopping etc.)



Conclusion: We use energy to do work just like animals and plants. Where do you think you get your energy from? Food

Session 2: Food & Energy Drama

How does the food we eat get its energy? E.g. How does the milk we drink get the energy to give us energy?

Let's find out mini drama - sun/grass/cow/farmer

Equipment: ball, sun glasses, green streamers for grass, hat for farmer, Picture of cow or toy cow- for the cow.



Volunteer 1: The Sun

Ask student 1 to hold up the ball and wear the sunglasses: This is the sun. (Sun start shining, warm up earth and provide light for our day).

Volunteer 2: The Grass

Grass lay on the floor under the sun.

What does grass need to grow? Sun/ water/soil

Sun continue to shine and shine on the grass and make it grow! (Grow grass!) Did you know that while the grass is growing it traps the sunlight inside it? (Grass trap some sunlight inside you).

Which animals like to eat grass? (Cows) Where does milk come from? (Cows)



Volunteer 3: The Cow

(Can you please start eating the grass.) Cows get their energy from eating the sunlight that was trapped in the grass. (Cow show the class that you are full of energy and give us a big MOO!) The cow is full of energy she can start to make milk.

Volunteer 4: The farmer

The cow is now full of milk. (Farmer milk the cow)

The cow got the energy to make milk by eating the grass which contains trapped sunlight energy.

The milk then goes to a factory gets put in cartons and sent to the shop and ends up on your breakfast table! (Farmer drive the milk to the factory)



Conclusion

Who had milk today? Who can tell me where the milk got its energy from? (The milk was made by the cow. The cow ate the grass to get energy to make milk. The grass got its energy to grow from the sun.) If the sun didn't shine - There would be no milk!

The biggest source of energy on earth is the sun! Energy makes things happen!



Session 3: Using our energy to care for plants and 'Sunlight Energy' to Grow Bean Seeds

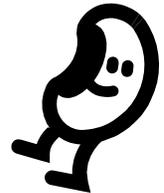
Equipment: bean seeds, cotton wool buds or paper towel, clear plastic cups, water, a marker

Options: You can run this activity as a whole class observation or have students placed in small teams responsible for 1 seed cup

Objective: To place 2 identical seeds in the same conditions in varying amounts of sunlight. This will show students that seeds need sunlight to grow.

Class demonstration - Student Observation

1. Take 2 identical clear plastic cups and ask students if they are the same - once you have established how they are the same, place the same number of cotton wool buds or scrunched up paper towel sheets inside each cup
2. Place a seed in each cup in the same position
3. Ask students how you will get the same amount of water in each cup?
4. Use measuring spoons or a another plastic cup with a water level marker
5. Add the same amount of water to each seed cup
6. Place one seed in a dark cardboard and the other near the window in the sun.
7. Watch and observe any difference in growth
8. Make a few samples in case you get faulty seeds-this will also make it possible for small groups of students to observe the seeds at one time.



Additional teacher notes

Bean seeds placed in wet cotton wool buds or on wet paper towel work well due to their fast growth rate and ease of germination.

The activity will work best if you use clear plastic cups for easy sight of the plants or seeds.

To ensure the plants are in identical conditions (fair testing) count out the number of cotton wool buds or sheets of paper towel with the students. Check that the cups are the same size and have a measuring system for the water. Use a few samples (in case you get some faulty seeds).

We use our energy to do fun jobs and care for plants

You can also achieve the same principal that 'plants needs sunlight to grow' by growing hairy heads.

Option 2

1. Use some energy to place some grass seeds and dirt in either a pantyhose stocking (or you can use an eggshell).
2. Tie the end of the pantyhose stocking in a knot and rest the knot and a small length of stocking inside a glass jar of water.
3. Use some energy to decorate your 'Hairy head' with a face (button eyes and draw on a mouth).
4. Watch your character grow hair by placing it in a window that faces the sun.
5. Care for your hairy head by replacing the glass jar with fresh water when required.



Class Plant Extension: You can place a few spare hairy heads in a dark cupboard & in partial sunlight and see if they grow at the same rate as the heads near the window. Purchase some class plants and create a list of jobs people do to care for them. Water them, place them in the sunlight, and add fertilizer to the soil. Discuss the ways the plant is using energy- you could even measure its growth over time. Use string to measure the length and hang different time periods (on a chart).

Session 4: Electricity

Note: teachers required to make a pin wheel

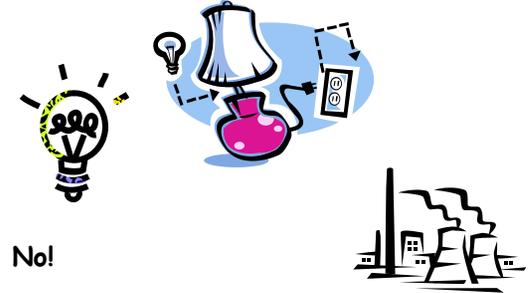
Google pin wheel lesson plans there are hundreds of pin wheel templates online

We have discovered we need energy and plants and animals need energy. (Revise the ways animals, plants and humans use energy)

Can anyone remember the biggest source of energy on earth? The sun, it gives our food energy

What things in this class room uses energy?

Activity 1: Create a list/or draw pictures of all the objects in the classroom that uses energy
(Clock/lights/computer/TV/stereo/ mobile phone/speaker)



Well these things all need energy to run just like we do.

But where does their energy come from? Do they secretly eat late at night when no one is watching? No!

- They use Electricity! They use electrical energy.
- Electricity is made in big power stations and it travels along wires into our homes - have you ever seen power lines? Show photos - on website.
- There are Power Stations all over Ireland that make our electricity (refer to website for picture of PowerStation near Dolymount beach in Dublin called 'Pigeon House').



Do you think we get charged money for using electricity? Yes we do?

How do the people who provide the electricity know how much to charge us for our electricity?

- In our homes and school we have an electricity meter and it counts how much electricity we use. See if you can locate your school electricity meter and show the students.
- The more we use the higher the bill. So if you leave the lights on all day it will cost the school more money. We must remember to use electricity wisely and not waste it.

Our Environment and electricity

- It's not only the cost of money to run things that use electricity like our TV and lights, we have to think about. We also have to think about the environment. Environment is a big word **does anyone know what the environment is?** The environment is the world in which we live in. It includes the land, water, sea, air, plants, animals and trees. Our classroom is our environment but so is our town, our country, Ireland, Europe, the World!

Activity 2: Can you draw a picture of our school environment?



Power stations

What do power stations make? Electricity to power our lights, radiators, phones and more

Power stations let out dirty smoke when they make electricity.

Draw a power plant on the board and draw big smog clouds coming out.



Power Stations get their energy to make electricity by burning coal, gas and peat.

They use this energy to heat water which turns a big wheel with a turbine (big fan) in it.

Coal is mined deep with within the earth it was made so long ago that the dinosaurs where still walking around earth. Have you and seen or smelt the black smoke a fire makes?

That's like the smoke the power stations let off. It stays in the air and hurts the environment.



Activity 3: Cut & paste: Place the pictures in order mine, coal, power station, smoke, person watching TV (flow diagram)

How we can help

By turning off the lights and TV when we are not using them we can help look after the environment. We use less electricity which means less smoke being made to produce electricity.

Wind Energy

In Ireland not all Power stations use fires to make electricity, some use water from a river & some use the wind. Wind is much better for the environment because it does not produce smoke.

This pinwheel is like a windmill. It needs the winds power to make it turn.

Wind powered power stations use a machine that looks just like this pinwheel. It is called a turbine.

The wind provides the energy to make it turn.

The turbine then powers another machine that makes the electricity.

The best thing is there is no burning, that means no smoke!

Can you think of any other things that use wind power? Wind chimes sail boats, kites & wind surfers.

Activity 4: Make pinwheels with students pretend they are used to make electricity from the wind- see if any smoke is produced?

Session 5: Wind Detectors

Today we are going to be wind hunters and look for wind energy. We will make a wind detector.



Teacher Instructions

1. Take recycled strips of scrap paper. Paint/colour and decorate the strips. You can use pieces of used wrapping paper, ribbon, or wool.
2. Take a coat hanger and attach the strips to the coat hanger (use a stapler or sticky tape).
3. Now you have a wind detector to test at 3 different locations around the school.
4. Can you find any wind inside the classroom? (draughts).
5. Teacher tip: this activity works well pairing students and having one wind detector per pair. Make sure to bring the stapler when you head outside for pieces that fall off along the way.

Build up vocabulary to describe the wind: calm, still, fast, slow, breezy



Mapping

6. Do you think we can make a map of the windiest spot so people will know where to find it? Create a labelled diagram of the windiest spot. Teacher demonstrates first: where was the windiest spot in the school? What was near this spot e.g. basketball court/ big tree. (draw on board) This is me standing near the big tree beside the fence holding my wind detector. Can you draw the windiest spot you found? Don't forget to draw the things you found nearby that spot.

Extension questions

Do you think the wind will ever run out?

Did you remember that wind can be used to make electricity? Do you think the wind in Ireland would be good for making electricity?

Where do you think is the best place/s for wind energy in Ireland?



Session 6: Standby Energy

Revision: We know people, plants and animals use energy. We get our energy from food which gets its energy from the sun. How a toaster or a kettle does get its energy? From electricity. Can you remember some other things that use electricity as their energy source?



Energy Vampires

Did you know if we don't turn things off at the switch (and a red light is still on) they are still using energy? They are called energy vampires! It's like when you're sleeping. You might think your energy is turned off but it's not! Our body still uses energy to breathe and make our heart beat—even to let out a few snores. Appliances (e.g. the kettle) are very similar

- Even though you think they are off they are still drawing energy from the switch. The only way to make sure they are using no energy is to turn the switch off. Explain how a switch and plug work.

Energy vampires love energy - they drain energy even when you think they're not & more energy than they will ever need!

What are they? They live in the electrical appliances that make human life easier. (Your phone & I-pod charger, TV, cordless phone, washing machine even your kettle) They act as vampires draining energy.

How do they do this? When appliances are on standby mode. (When you're not using them but they are still plugged in) they still consume electricity. Up to 20%

Stop them! The only way to stop them is to unplug or turn appliances off at the direct source of power.



Scenarios to act out

1. How to unplug the phone charger
2. How to unplug the hairdryer
3. Choice do you turn the TV off at the switch or with the remote control
4. How to turn off the computer at the end of the day



Can you think of extra ways to save energy at school and at home?

- Turn lights out when we leave the classroom at lunchtime
- Don't leave lights or TV on when we are not using them
- Turn TV and kettle and toaster off at the switch
- tell parents to unplug phone chargers
- Use a blanket on the couch instead of turning on a heater
- Create a class job of lights monitor

Extension:

- Create wind chimes from recycled waste materials
- Play the acting out energy game in pairs.
- Go on an energy hunt and hunt for things that use electricity around the school and classroom
- Create a class energy timeline- all the ways you use energy in a day
- Invite SEI (sustainable energy Ireland) to do a class visit or visit their website for colouring in sheets and energy ideas).