1st and 2nd Classes

THEME: ENERGY

'Stop that draught and save electricity!'

Curricular Strands
Maths- Measures
SESE-Science-Skills-Designing & making: Exploring/Planning/Making/Evaluating
SESE-SCIENCE- Environmental Awareness & Care
Science- Magnetism & Electricity

Objectives/Tasks
Part 1 Learning about electricity (s= session)
S1/S2: What items/appliances use electricity and common electricity sources
S3: Discovering the electricity metre and electricity costs
S4: Heating: human heating needs and behavioural change between summer and winter
S5: Renewable vs. non renewable-What is electricity? How is it made? Does it cause any damage to earth when it is being made? Can electricity be made with less pollution?
S6: Energy Vampires: how to save electricity by turning electrical items off at the switch and not to leave items on standby mode

Part 2 Design & Making 'Draught o metre' & 'Draught Guards'
S1-Discovering draughts: the presence of draughts increase heating needs in the home and school & Construct a draught o metre to test the presence of draughts in the home and school
S2: Evaluate the success of the 'draught o meter'
S3: Construct a draught guard to reduce the presence of draughts in the home and school
S4: Evaluate the success of the draught guard

Session 1: What does the computer kettle, toaster need to run? (Energy- electrical energy in the form of electricity) Put on a 1 min timer and get students to list as many items as they can, that uses electricity. Turn this into a class list/poster. (You can choose to have 2 charts 1 for items that do/don't use electricity)



€ Money!

Session 2: Take students on an electricity hunt around the school where they look for more appliances/items that use electricity e.g. photocopier.

Session 3: Does it cost money to use electricity? How could a person find out how much electricity is being used? (If possible show students the schools electricity meter revisit it and watch the numbers grow or ask them to find their Own electricity meter at home)
Look at costs of running different appliances: Visit www.esb.ie- appliance calculator: complete some simple maths calculations e.g. add up the cost of using a hairdryer and coffee maker over 2 months

Session 4: Heating
What ways do we keep warm in winter? Create a class list

- Put on clothes, do some exercise.
- Turn on the heating, use a hot water bottle
- Stay indoors, close the curtains (to trap heat).
- Use an electric blanket, light a fire.
- Use a blanket when sitting on the couch.

Does the way you dry your clothes change in winter?

In winter you might use a dryer for clothes (uses electricity)
What could we do instead? (Use a clothes horse)
Do we use any electrical appliances more in the winter?
A hairdryer to dry wet hair, plug in heater

In your copy book what headings can we use to sort the information we have talked about?
E.g. Closing curtains, light fire, using a hair dryer
(Use words and pictures) to sort the items under the heading of Electricity vs. No Electricity

Discuss
Which items use no electricity?
E.g.: Putting on clothes, using blankets & closing curtains

Which items use low amount of electricity?
E.g.: Hot water bottle

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Session 5: Create a timeline of the electricity used in your day

Fold a page into 4 parts label: getting ready for school/ at school/ after school/ going to bed

(E.g. turn on light-shower-toaster-microwave-dishwasher-computer-TV)

Session 6: What is electricity? Key questions: How is it made? Does it cause any damage to earth when it is being made? Can electricity be made with less pollution?

1: Use the online teacher information (flowcharts of electricity production) to create a flow diagram of how electricity is made

2: Turn the flowchart into a student drama with the class (it is important for students to have a basic understanding of how electricity is made from coal.) Emphasise the fact that coal is non renewable and will not last forever! Identify the wind as a renewable source of energy that causes pollution.

3: Look at renewable energy: (use the flowchart) and act out how wind powered energy is produced:

4: Discuss and compare the difference- (electricity produced from coal=more pollution) Note: See session 4 of the infant's/1st class series for a simplified explanation of this concept

- Create a Venn diagram to compare both sources of electricity production (You can create pinwheels to model the turbine powering the power station-see website links Part 1)

Part 1 Conclusions: Why do we need to save electricity?

- It costs money to use electricity,
- Wastes resource
- Power stations harm the Environment.

Evaluation Link to Session 4: What ways will you warm up in winter?

How can we save electricity at home and in the classroom? Develop a classroom plan!

Session 7: Energy vampires!

(Act) What's wrong with leaving appliance plugged in or turning the TV off with the remote control?

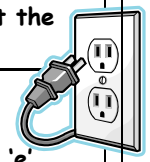
Explain the concept of energy vampires: refer to the Green Home householder challenge 'energy vampires' for detailed information

Energy vampires love energy- they drain energy even when you think they're not & they drain 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 (e.g. when a red display light is present)
(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.



Lesson Ideas

- Hunt for 'e' vampires in the classroom / school
- Act out scenarios with students to teach them how to stop the 'e' vampires! Note: see Session 6 of Infants/ 1st class for acting scenarios
- Create a poster to educate others (e.g. save 20% off your power bill by stopping 'e' vampires).

Website Links to Part 1

Visit airtricty green zone: http://www.greenzone.airtricity.com/ download worksheets on electricity, what's renewable & a template for a wind turbine (pinwheel)

Visit: www.powerhousekids.com, look under fun and games: cool projects to try at home

Check out the online website and games link on the green home website
Visit www.greenhome.ie

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Part 2 Session 1 'Identifying draughts and making a draught o meter'

Today we are going to become draught hunters to help save electricity at home and at school

Draughts: Has anyone ever felt a small breeze creeping through cracks in the wall or windows? This is called a Draught

Why are draughts good?

(Good: because they cool you down and let in fresh air circulate)

Why are drafts bad?

(Bad because they let cool air in the winter and we need more heating=more energy waste)

How will we hunt for draughts? Can we see them? (No we can only feel them)
We will make a 'draft-o-metre'

Equipment Sticky tape, pencil, cling wrap, newspaper, reused wrapping paper, scrap paper, tin foil-show students a pre-prepared draft o meter

Initial Planning -Questioning: Which material do you think will make the best 'draft o meter'? Will the aluminium work better that the cling film? Which material will you use to make a' draught o meter'? Why do you think this material will work best?

(Allow students to examine materials)

Teacher Instructions

1. Cut a rectangle of the chosen material approximately 10 cm by 25 cm (You can have a pre-prepared rectangle size or ask students to measure and draw the rectangle by themselves)
2. Tape the shortest edge of the rectangle to a pencil using sticky tape
3. Test your 'draught o meter' by blowing gently to see how sensitive it is.

Planning: General Class Instructions

1. Write a list of all the equipment you will need to make your draft o meter
2. Draw what your draught o meter will look like-can you use a ruler to draw it the actual size? And label its measurements? (You can have a pre-prepared rectangle size or ask students to measure and draw the rectangle by themselves)
3. Can you use words and arrows to explain your plan?

Making

1. What instructions or steps do we need to follow- create a class list of steps (above)
2. Make your draught o meter & don't forget to follow the measurements on your plan - Decorate your 'draught o meter'

Testing –Initial Evaluation

Team up with a buddy who has made their draught o meter out of a different material and work together to test your 'draught o meters' in the locations listed on the student template sheet- don't forget to tell your partner one thing you like about their 'meter'

Students test the following locations on the template provided and rate their draughts -if time permits you may wish to test your meter on different days- find a day with a strong wind **Control: Find an area where there are no draughts all students could test their metres as proof they don't move by themselves when held steady (for improved accuracy)**

Location	No draught	Weak	Medium	Strong
Closed Window				
Closed classroom door				

Session 2 Evaluation questions-discussion

Class question: Did you get the same results as your partner why? Did one draught o meter work better than another why? Was your draught o meter the same as your plan? Is there any way you could improve your draught o meter?

Option: before completing the homework task you may allow students to remake/modify their draft o meters to work to the best capacity. This is part of the design/making process-this may also be done once the draught guard has been made- as the draught o meter will be used to judge the effectiveness of the draught guard in session 3

Final Evaluation: Use your plan & recording sheet to answer the following

Draughts

1. Where were there no drafts-list the locations
2. Where were the strongest drafts? List the locations

Draught O meter

3. If you could change (or if you changed) the material of your draught o meter what (did) you change it to?
4. Why would (did) you make this change?
5. How could (did) you improve your draught o meter?
6. What location would you like to make a draught guard for? (explain draught guard)
7. Why have you chosen this location

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Homework Section

Students take their 'draught o meter' home as homework task and complete the homework template. This is very important as in Session 3 students will need to measure a place at home or at school for which they will make a draught guard.

Session 3 Draught Guards

Now that we have identified places where draughts exist how can we stop them? Brainstorm student's ideas.
By making a draught guard- show students a sample

Option: you can turn this activity into a design and making session by following the planning and making questions from the draught o meter or you can keep it as a simple art and craft session

Equipment

1. Stuffing: Provide students with a choice: rice, dried lentils, cushion stuffing, newspaper
2. A body: panty hose stocking- rugby sock or small sock for small draughts (ask students to collect these items)
3. Eyes: choice -Plastic wiggly eyes /button or marker pen
4. Small containers and spoons for scooping and pouring the stuffing
5. Strong glue to guard: note you can tie a knot in the stockings or panty hose
6. Scrap material and wool for decoration

Procedure

Measurement

Ask students to identify a location for their draught guard
It can be at school or at home
How do you measure the position if it is curved- use string and measure the string
Based on the size of the space brainstorm the best material to make guard from Long stocking - rugby sock - pop sock.

Decoration & Stuffing

What could we fill our draft guards with? Remember we something that will stop the draught?
Do you think cling film would work as a filling? Why? What would be a better filling?

How can you decorate your draught guard- glue on pieces of coloured materials, wool for hair? Create an outfit out of scrap material?
Will you turn your guard into an animal or character?

Plan

Students create a plan detailing the measurements and decorations for their draught guard
Their plan should include how the draught guard will be decorated and the materials they will require

Making

Create a class list of general instructions so that all students are clear about to make their draught guard—this can be turned into a procedure writing session in English. Students make and decorate their draught guard

Evaluation

Students use their draught o meter to evaluate the effectiveness of their draught guard
Take your draught o meter and you draught guard position your draught guard- use your draught o meter to test if the draught has been stopped or reduced.
You will want to test this over different time periods of the day

Note; if you choose to make this a design & making lesson. You will need to ask a series of design questions.

Evaluation Questions

1. **Did your draught guard stop or reduce the draught?**
2. **Do you think your filling helped to stop the draught? Why/why not?**
3. **Could you improve your draught guard to make it work better? How?**

Extension Activities

- SEAI: (Sustainable Energy Authority Ireland) provide a temperature gauge to tell ideal room temperature –order this for the classroom and record times/days when the classroom temperature scale is out.
- Make draught o guards for areas in the school that experience draughts.
- Make pin wheels as an art project and test the wind on different days around the school.
- Learn about wind as a renewable source of energy-act out the process of making wind energy using student fact sheet.

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- Discuss other sources that use electricity besides heating –create a list of tips to reduce energy use around the school and home.
- Create a verb chart of (doing words) for writing procedures: cut, glue, draw, staple
- Create a list of adjectives(describing words) to describe guards and meters: strong , colourful, protective, bright, soft, furry

Thanks for all your hard work!