

## GRADE 6 LEARNING EXPERIENCE

# A Recipe for Electricity: How Different Resources can Power your House

### Summary

Through engaging hands-on activities, students will learn how electricity is made from renewable and non-renewable sources. Students will draw, act, create models, write poems, or write stories to explain how electricity can be generated from organic material.

### Objective

Students will understand how electricity can be generated from various resources, including organic waste.

### Pre-Activity

## WHERE DOES ELECTRICITY COME FROM?

#### DIRECTIONS

### MAGNETIC FORCE

Give students magnets and paper clips. Ask them to move paper clips around their desks without letting the magnets touch the paper clips. Ask students if they know how magnets are related to the generation of electricity.

Explain that just as magnets can move paper clips without touching them, spinning magnets can move particles (electrons) in wires—which generates electricity.

### VIDEO

Students watch the video **Energy 101** to learn about how electricity can be generated from natural resources.

**LINK TO VIDEO** [www.youtube.com/watch?v=20Vb6hLLQ5g](https://www.youtube.com/watch?v=20Vb6hLLQ5g)  
(05:00 / Source: energynownews, YouTube)

**MATERIALS**  
Magnets and paper clips

**DURATION**  
5 min

**MATERIALS**  
Internet and projector or other viewing devices

**Energy 101**  
video (5 min)

**DURATION**  
5 min

#### MAIN LEARNING OUTCOME

**GRADE:** 

**SUBJECT:**   
**Science**

Learners will evaluate renewable and non-renewable sources of energy.

#### SKILLS

**Evaluate**  
Review steps and results from an investigation or problem solving. Reflect on and communicate varying perspectives and alternative solutions or findings. Identify potential new problems and/or issues.

**Investigate**  
Ask and revise questions; locate several relevant and dependable details to support an answer; organize and compare details; identify relationships, recognize represented perspectives, and communicate findings.

**Compare**  
Make observations; identify similarities and differences; identify relationships and offer an interpretation; reflect on the findings.

**Analyse**  
Gather and select appropriate information. Begin to reflect on accuracy, validity, and importance, of the information. Communicate findings.

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## WHERE DOES ELECTRICITY COME FROM? (cont'd)

### DIRECTIONS

### GROUP DISCUSSIONS

**DURATION**  
10 min

Discuss the section of the video that described how coal, natural gas, and biomass can be burned to heat water, create steam, spin a magnet, and create electricity.

Break the students into small groups and ask them to write down examples of fuel sources that can be combusted to make electricity. Where are they from? What impacts are there on the earth when we collect these natural resources?

Review biomass fuel sources, and note that wood pellets are made from wood scraps from the lumber industry.

Discuss what natural gas is and where it comes from.

Explain how food waste and animal waste can produce another gas—methane, which can be combusted to make electricity. Explain that when these organic materials decompose in places without oxygen (i.e. landfills) methane is created.

### Activity

## CREATIVE DEPICTIONS OF ELECTRICITY GENERATION

### DIRECTIONS

### COMPOSITION

Divide students into small groups and provide each group with a **Natural & Renewable Resource Card (Appendix 1)**.

Each group is asked to develop a creative story (or poem, model, etc.) explaining how their assigned natural or renewable resource is collected and turned into electricity, and how the electricity travels to their house. Use **Electricity's Journey to My House sheet (Appendix 2)** as a resource.

To help develop stories, students will research (using the internet) how the natural resources are collected.

### MATERIALS

**Appendix 1**  
Natural &  
Renewable  
Resource cards

**Appendix 2**  
Electricity's  
Journey to My  
House sheet

Internet access

**DURATION**  
30 min

### STORY SHARING

Ask each group to share their story with the class. If time is limited, ask groups to volunteer to share their stories with the class or have them share their stories with another group.

**OPTION** Watch how "Energy Efficiency" is Nova Scotia's cleanest, cheapest fuel:

[youtu.be/FGnh0uzZmmU](https://youtu.be/FGnh0uzZmmU)  
(02:07 / Efficiency Nova Scotia)

**DURATION**  
30 min

## Post-Activity

### GROUP DISCUSSION

#### DIRECTIONS

As a class, discuss the following questions:

- Which of the fuels we discussed today (coal, natural gas, biomass, methane) are renewable resources? Which are non-renewable?
- Ask the students which resources have the greatest impact on the earth when they are collected to make electricity.
- Which resources have the smallest impact?
- Do you think it is better to use renewable resources to generate electricity or non-renewable resources?
- What waste materials often end up in the landfills that we could use to generate electricity? Food waste (methane), wood (biomass).

#### MATERIALS

n/a

#### DURATION

20 min



#### WASTE REDUCTION EDUCATORS

Divert NS provides funding to municipalities to deliver waste reduction education to schools across the province. Your local waste reduction educator(s) provides the following services, and more, free of charge!

- classroom presentations
- green team set up
- advice on bins and signage
- tours of local waste facilities
- school waste audits

To find out more, visit [divertns.ca](http://divertns.ca)

## Assessment

**FORMATIVE** Evaluate student learning over the course of the class discussion.

**SUMMATIVE (OPTIONAL)** Option to evaluate the “Electricity’s Journey to My House” story



#### ENVIRONMENTAL EVENTS

There are many great opportunities throughout the year to highlight the 3Rs in the classroom. Check out these annual events:

**Waste Reduction Week** October (3<sup>rd</sup> week)

**Earth Day** April 22

**Compost Awareness Week** May (1<sup>st</sup> full week)

**Environment Week** June (1<sup>st</sup> full week)

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## ABOUT DIVERT NS

Divert NS is a not-for-profit organization championing recycling in Nova Scotia. For over 20 years we’ve helped build a culture of recycling through environmental stewardship, education, and innovation. Divert NS operates the **Beverage Container Deposit–Refund Program** and the **Used Tire Management Program**. In addition, we work in collaboration with government,

industry, and academia to divert waste-resources from landfill. Divert NS, in partnership with municipalities, delivers education and awareness programs to schools, businesses, and community groups. Divert NS also works to develop stewardship agreements and funds innovative research and development initiatives.

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## Natural & Renewable Resource Cards



**Methane Gas**

**Solar**

**Wood Pellets**

**Wind**

**Natural Gas**

**Geothermal**

**Coal**

**Tidal**

APPENDIX 2:  
A RECIPE FOR ELECTRICITY

# Electricity's Journey to My House

The recipe cards below explain how various resources can be used to create electricity for your house.



- 1) Pick one of the “recipes” below, and do some more research so you understand how electricity can be created using that method. Find out:
  - a) how your resource is collected;
  - b) how it is turned into electricity; and
  - c) how that electricity travels to your house.

- 2) Show or explain what you have learned in **ONE** of these ways:

Act it out, draw a diagram with notes, write a poem, write a story... you decide!

## Recipe for Electricity: Solar Energy

1. Solar Panels absorb the sun's energy and convert it to “DC” current.
2. An inverter converts DC current to “AC” current, the kind used by most home appliances.
4. Electricity flows through wires in your home, providing power to your lights and wall outlets.
5. Often, excess electricity produced by solar panels at home can be sold back to the local power company.

## Recipe for Electricity: Combustible Material

1. A combustible (burnable) resource is collected.
2. The resource is brought to a power plant.
3. The resource is combusted (burned).
4. Heat from burning the resource warms water and creates steam.
5. The steam turns propeller blades inside a turbine.
6. The propeller-like blades spin a rotor, which makes a magnet spin.
7. The spinning magnet generates electricity.
8. The electricity travels through wires to your neighbourhood and to your house.

## Recipe for Electricity: Wind & Tidal Power

1. Wind or water spins the propeller blades around a rotor.
2. The rotor is connected to the main shaft.
3. The main shaft is attached to the gearbox, which increases rotations across the high-speed shaft.
4. The high-speed shaft spins a generator.
5. The generator creates electricity.
6. The electricity travels through wires to your neighbourhood and to your house.