Teacher's Guide

Saving Energy – High School Edition

Hydro Québec

Acknowledgments

Hydro-Québec is pleased to present the Wattson Learning Kit, created to teach young people about energy efficiency. The kit offers high school teachers a range of fun and original activities to help their students become vigilant, well-informed consumers when it comes to using electricity.

We wish to thank the many teachers and students who helped with the production of this kit in any capacity. Special thanks go to Natalye Bertrand and Marc Traversy, who provided input on the activities and reviewed the educational competencies for each one. We would also like to acknowledge the design and development work done by the team at Virus 1334.

We hope your students will find that learning to use electricity wisely can be fun!

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Introduction

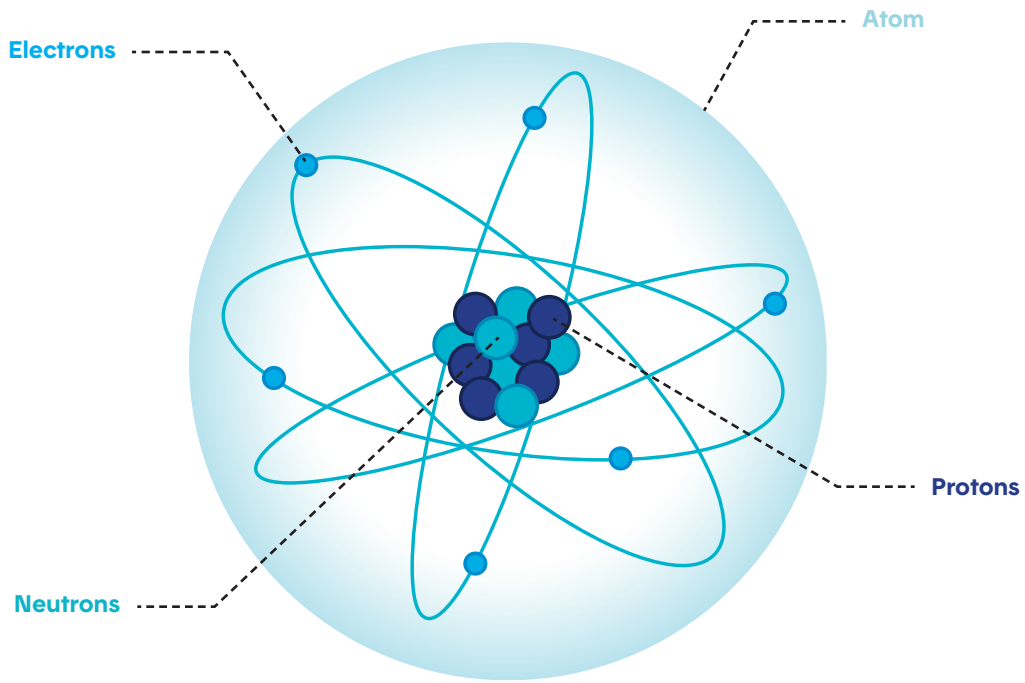
What is electricity?

Electricity is an invisible phenomenon caused by the flow of electrons in a conductor. Electricity can be generated from a number of sources, including wind, sunlight, fossil fuels, moving water and even nuclear fission.

Québec is fortunate to have vast energy resources at its disposal and is known around the world as a major hydropower producer. Thanks to some 60 hydroelectric generating stations, the energy that Hydro-Québec supplies to Québec homes is almost entirely generated from renewable sources.

Although hydropower produces very low greenhouse gas (GHG) emissions and is generated from resources that are constantly renewed, it is important to use it responsibly. After all, the greenest energy is the energy we don't use!

The definitions of a few electricity-related terms can be found in Appendix 1.



Background

Energy efficiency, Wattson style!

In a context of planet-wide climate change, over-consumption and exponentially rising energy costs, everything we can do to reduce our environmental footprint is a step in the right direction. Better still, when we all work together, those actions can have a real, positive impact on the environment. A small change by one person, multiplied by thousands or even millions more, can make up for some of our poor habits in the past. So when we reduce our energy consumption, the environment benefits and we save money, too.

With a little effort, we can all find ways to cut our energy consumption. Sometimes all we need is to do things a little differently or choose devices and appliances that are labelled energy efficient, meaning they are recognized for their lower power use.

It's better with Wattson!

Hydro-Québec has teamed up with Wattson, an electric eel, to develop a guide full of fun and educational activities that teach high school students about energy efficiency. There are lots of myths and false beliefs surrounding the use of electrical devices, and it's not always easy to tell what's true from what isn't.

Since Wattson produces his own electricity (he's got great connections!), he knows that using it unwisely is a waste of energy. Eels use their electricity for hunting, self-defence and detecting prey and obstacles, so it's essential to their comfort and survival.

Every day, we use electricity to heat, cool and light our homes, cook food, wash, get around, keep ourselves entertained and more. In fact, electricity is used in just about every facet of modern life!

Background

What is the Wattson Learning Kit?

The Wattson Learning Kit comprises a wide range of activities that can be carried out independently. They vary in length, and you can choose the duration depending on your class level and the subject you teach. The kit was designed to demand as little preparation time on your part as possible. For each activity, you will have an explanation and a backgrounder as well as all the information you need to answer questions about various aspects of day-to-day power consumption. Quizzes, debates and essays will give students opportunities to think, explore and take action. Wattson, your sidekick, will be their guide and mentor, helping them assimilate new concepts and acquire new knowledge.

Activities are geared to students in specific cycles to ensure they are fun and age-appropriate. The target cycle is indicated for each activity.

TARGET CYCLE FOR THIS ACTIVITY

CYCLE 1 CYCLE

Target competencies

Hydro-Québec's objective

Objective: Teach students about the benefits of using electricity responsibly

Hydro-Québec carries out awareness activities to encourage Quebecers to use electricity wisely. To help young people develop the right reflexes when it comes to energy efficiency and being responsible energy consumers, it has created educational content with students in mind.

Competencies to be developed

Target competencies and approach

Cycle 1 activities introduce the concept of energy efficiency and educate students about how it can be applied in their daily lives.

Cycle 2 activities familiarize students with the economic and ethical aspects of energy use.

All activities are adapted to students' stage of development and provide opportunities to:

- Develop strategies and reflexes to save electricity
- Adopt habits that encourage responsible energy consumption
- Discuss energy use with family and friends

wisely

ethical

responsible

educate

efficiency

activities

energy

benefits

Summary of activities

ACTIVITY	TARGET CYCLES	SUBJECTS	DURATION
Head in the Clouds	Cycle 1	**English Language Arts**	50 minutes
		Geography Energy-producing regions	
The DecaWatt Challenge	Cycle 1	**Geography** Energy-producing regions	50 minutes
	Cycle 2	**Financial Education** Financial issue – Consuming goods and services	
I'm reducing my electricity use!	Cycle 2	**Financial Education** Financial issue – Consuming goods and services	2 x 50 minutes
Family Portraits	Cycle 2	**Financial Education** Financial issue – Consuming goods and services	50 minutes
Face-off	Cycle 2	**English Language Arts**	3 x 50 minutes
		Financial Education Financial issue – Consuming goods and services	
		Contemporary World	

Summary of activities

ACTIVITY	TARGET CYCLES	SUBJECTS	DURATION
Less is more !	Cycle 1	**Geography** Energy-producing regions	50 minutes
		Broad area of learning - Environmental awareness/ consumer rights and responsibilities	
Do you know what I know	Cycle 1	**Geography** Energy-producing regions	50 minutes
	Cycle 2	**Financial Education** Financial issue – Consuming goods and services	
		Broad area of learning - Environmental awareness/ consumer rights and responsibilities	

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Appendix 1

Appendix 1

DEFINITIONS	
Energy saving	Something that uses less energy than similar devices.
Energy efficiency	Adopting habits and taking steps to save energy and use it wisely.
Electricity	A form of energy created by electrons moving through a conductor to produce an electric current. This is also the type of energy most often used in Québec homes.
Energy (also "power")	Capacity to act (do work, create movement or cause change).
Energy-wasting or energy-intensive	Something that uses a lot of energy.
Hydropower	Energy generated from water.
Kilowatthour	A unit measuring the amount of energy used by a device in a given period. For example, 1 kWh equals 1,000 watts used for 1 hour.
Kilowatt	A unit of measure of a device's power.
Power	A generating station's ability to generate electricity at a given time.

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For the most up-to-date information, please visit our Web site at
https://www.hydroquebec.com/teachers/high-school/cycle2/wattson.html

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Ce document est également diffusé en français.

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