

# Lesson Plan

## Financial Literacy in Grade 6 Science and Technology and Language Saving Energy – Personal, Global and Financial Implications

Students build an understanding of the connection between their own choices related to energy usage and personal, global and environmental impacts. Building on their experiences doing a cost analysis of light bulb use, students use critical thinking skills to consider actions and consequences of actions. The school's energy use during Earth Hour is also analyzed using information from the school caretaker and school board energy database. Students build a global perspective by making connections between individual actions and their impacts.

### Curriculum Expectations

[Click here](#) to access expectations written out in full

#### Grade 6

##### Science and Technology (2007)

###### **Understanding Matter and Energy: Electricity and Electrical Devices**

###### **Relating Science and Technology to Society and the Environment**

1. *evaluate the impact of the use of electricity on both the way we live and the environment*  
1.2

###### **Developing Investigation and Communication Skills**

2. *investigate the characteristics of static and current electricity, and construct simple circuits*  
2.7

##### Language (2006)

###### **Reading**

1. *read and demonstrate an understanding of a variety of literary, graphic, and informational texts, using a range of strategies to construct meaning;*  
1.9 Point of view

###### **Writing**

1. *generate, gather, and organize ideas and information to write for an intended purpose and audience;*  
1.3 Research  
1.4 Classifying Ideas

##### Mathematics (2005)

###### **Mathematical Process Expectation: Problem Solving**

###### **Number Sense and Numeration – Operational Sense**

1. *Solve problems involving the multiplication and division of whole numbers, and the addition and subtraction of decimal numbers to the thousandths, using a variety of strategies*

### Learning Goals

By the end of this lesson, students will be able to:

- Explain the importance of conserving energy
- Consider different points of view on energy conservation and relate the financial and environmental implications associated with energy use
- Use scientific investigation skills and create an inquiry question that supports taking action towards reducing electricity use

**Sample Success Criteria** for an inquiry question:

- Begins with “If I” or “How can I”
- I cannot easily Google the answer; I must investigate
- Has a clear focus
- Is an authentic question that interests me
- I have used my prior knowledge to guide my question

### Readiness

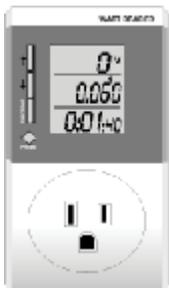
- Students have engaged in an experiment comparing the amount of electricity used by traditional light bulbs, energy efficient light bulbs and LED light bulbs. Used jigsaw strategy to investigate electricity use and conservation strategies.
- Students have used a watt meter and conducted a cost analysis for each type of bulb.
- Students have calculated how many light bulbs are used in their home, determined the types of bulbs and calculated the associated costs using the [Cost of Lighting Your Home](#) handout.
- Students are familiar with how to develop an inquiry question.

### Terminology

- Earth Hour
- Energy Efficient
- EnerGuide label
- Kilowatt
- Kilowatt hour (kWh)
- Incandescent
- Compact Florescent Light
- Halogen

### Materials

- [Earth Hour website](#)
- music to play during Mill to Music activity
- Handouts
  - [Cost of Lighting Your Home](#)
  - [Why Save](#)
  - [The Inquiry Process](#)
- Background/Extension resources
  - Graphic depictions of [energy use of major appliances](#)
  - [Comprehensive energy](#) information site, some student-friendly interactive features
  - Natural Resources Canada information about [energy consumption of appliances and the Energy Star rating system](#)
  - [Energy consumption of different types of lighting](#)
  - Student-friendly site on [electricity in Ontario](#)
  - Watt Reader



## Minds On

Students share parts of their learning log from their investigation of the types of light bulbs in their home and their calculations on the cost of lighting, including:

- something they learned,
- an interesting point and
- a “muddy” point – something they want to investigate further.

## Action!

### Whole Class Discussion with Guest Speaker

- Remind students of their participation in Earth Hour, or explain how other schools have participated in Earth Hour using information from the [Earth Hour](#) website.

Sample questions to ask:

- What did we do? Why did we do it? Using our own small scale tests on the costs of electricity, how much money do you think our school saved in one hour?
- Arrange to have the school caretaker in as a guest speaker to show the financial and environmental impacts of the actions taken during Earth Hour. If the school did not participate in Earth Hour, ask the school caretaker to present energy information showing different levels of consumption that occur throughout the day.

### Small group discussion and calculation

- Pose the following question to students:
  - If our school saved \$# in one hour, and there are #x schools in our board, how many dollars did our board save during Earth hour?

### Think-Pair-Share

- What are the financial implications of turning off electricity for one hour?

### Whole class discussion and Mill to Music

- Students will respond to the question
  - How can we conserve energy at home?
- Mill to Music – Students move around the room when the music starts. When the music stops, they move to a [Why Save](#) sheet and brainstorm in groups reasons to save, considering environmental, personal and global reasons. When the music starts again, they move around the room again. Each time the music stops, students stop at a new sheet, read the ideas already there and add their thoughts to the ideas on the page. Finish with a discussion of the ideas the students brainstormed.

### Independent Practice/Small group—Developing an Inquiry Question

- Discuss Inquiry Question Success Criteria
- Model how to develop a meaningful and action-oriented inquiry question.
- Using their cost analysis from their completed [Cost of Lighting Your Home](#) handout as a reference, students will develop an inquiry question on how to reduce the impact, financial and environmental, of electricity consumption at home.  
Sample student inquiry questions:
  - How much can I conserve if I turn off my computer during the night?
  - If we switched all our light bulbs to energy efficient bulbs how much can we save?
  - Would it be better to use up our regular light bulbs first before replacing them with energy efficient bulbs?
  - If my family only uses appliances such as washers and dryers during off-peak times how much can we save?
  - How much energy am I using when I play video games?

### Gallery Walk

- Students will post their inquiry questions and engage in a gallery walk to see the ideas of their classmates.

## Connections

### Guiding Questions:

- Were you surprised by anything you learned?
- How can you decrease the amount of energy you use (and associated costs of energy) in your own home?

## Connections

### Guiding Questions:

- What are some of the ways that we use energy every day?
- What are the environmental costs of those choices?
- What are the financial costs of those decisions?
- How can we compare the immediate costs of energy efficient products to the long term costs?
- What messages do you think are important to send to young people to think about this topic?

### **A<sub>1</sub>L** Assessment for Learning (AfL)

- Circulate during Mill to Music to observe student responses to the [Why Save](#) activity and check student understanding of reasons for saving electricity.

### **A<sub>2</sub>L** Assessment as Learning (AaL)

- Students' articulation of success criteria for an inquiry question

### **A<sub>3</sub>L** Assessment of Learning (AoL)

- Inquiry question

**Individual Work—Learning Log**

- Students will add to their learning log for this learning experience:
  - 3 things they learned,
  - 2 interesting points and
  - 1 “muddy” point – something they want to investigate further.

**Extension—Use of Technology for Further Feedback**

- Students share their inquiry questions on a Moodle (an online learning management system for sharing information). Students provide each other with feedback and ideas for how to conduct the inquiry.

**Next Steps—Develop a Plan**

- Students will develop success criteria for a plan for implementing their inquiry. They will share ideas on VoiceThread (an online tool for sharing conversations and feedback) and provide feedback for each other based on the success criteria.

**A&L Assessment as Learning (AaL)**

- Students use learning log to record key things they learned from the lesson.

# Curriculum Expectations

## Financial Literacy in Grade 6 Science and Technology and Language *Saving Energy – Personal, Global and Financial Implications*

### Grade 6

#### Science and Technology (2007)

##### Understanding Matter and Energy: Electricity and Electrical Devices

1. evaluate the impact of the use of electricity on both the way we live and the environment
- 1.2 assess opportunities for reducing electricity consumption at home or at school that could affect the use of non-renewable resources in a positive way or reduce the impact of electricity generation on the environment

##### Developing Investigation and Communication Skills

2. investigate the characteristics of static and current electricity, and construct simple circuits
- 2.2 use a variety of forms (*e.g., oral, written, graphic, multimedia*) to communicate with different audiences and for a variety of purposes (*e.g., using scientific and technological conventions, create a labelled diagram showing the component parts of the device they created to transform electrical energy into another form of energy and perform a function*)

#### Language (2006)

##### Reading

1. read and demonstrate an understanding of a variety of literary, graphic, and informational texts, using a range of strategies to construct meaning;

##### Point of View

- 1.9 identify the point of view presented in texts; determine whether they can agree with the view, in whole or in part; and suggest some other possible perspectives (*e.g., ask questions to identify any biases that are stated or implied in the view presented*)

**Teacher prompts:** “Who would be most likely to share this point of view? Who would not?” “How would you revise the text to appeal to a different or a wider audience?” “Why do you think stereotypes are used in certain texts?”

##### Writing

1. generate, gather, and organize ideas and information to write for an intended purpose and audience;

##### Research

- 1.3 gather information to support ideas for writing, using a variety of strategies and a wide range of print and electronic resources using a variety of strategies and a range of print and electronic resources (*e.g., identify the steps required to gather information; interview people with knowledge of the topic; identify and use graphic and multimedia resources; record sources used and information gathered in a form that makes it easy to understand and retrieve*)

##### Classifying Ideas

- 1.4 sort and classify information for their writing in a variety of ways that allow them to view information from different perspectives and make connections between ideas (*e.g., by underlining or highlighting key words or phrases; by using a graphic organizer such as a fishbone chart, a T-chart, or an “Agree/Disagree” chart*)

#### Mathematics (2005)

##### Mathematical Process Expectation: Problem Solving

- develop, select, and apply problem-solving strategies as they pose and solve problems and conduct investigations, to help deepen their mathematical understanding;

##### Number Sense and Numeration – Operational Sense

- Solve problems involving the multiplication and division of whole numbers, and the addition and subtraction of decimal numbers to the thousandths, using a variety of strategies

# Cost of Lighting Your Home

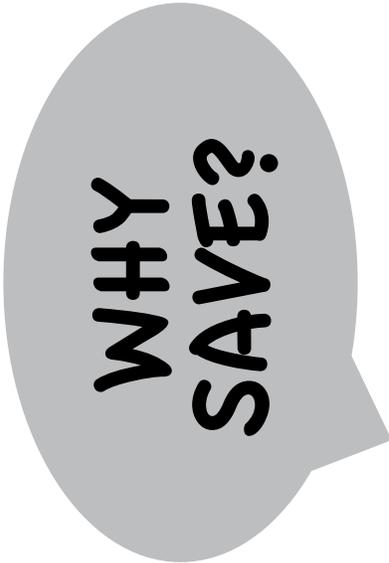
Take an inventory of all the lights in your house. Record your findings in the chart below. Try to find out:

- 1) how many bulbs in each room      2) the type of bulbs      3) the wattage of the bulbs

Do the calculations to figure out the costs.

Room	# of Lights	Type of Bulb	Wattage of Bulbs	Cost for Electricity *\$0.086/kWh	Total Cost of Light (for 1hr)	Total Cost per Room (for 1hr)	Total Cost for 1 year (for 1hr of use each day)
Living Room	1 ceiling light 2 lamps	CFL CFL	100W (2) 60W	= \$0.000086/W	100W x \$0.86 = <b>\$0.0086</b> 60W x \$0.86 = <b>\$0.00516</b> 60W x \$0.86 = <b>\$0.00516</b>	\$0.0086 \$0.00516 + \$0.00516 <b>\$0.01892/hour</b>	\$0.01892 x 365 = <b>\$6.91</b>

Name: \_\_\_\_\_ Date: \_\_\_\_\_



**WHY  
SAVE?**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# The Inquiry Process

**1.** My Question is:

**2.** My plan for my investigation is..... (*procedure*)

**3.** Observations / Data:

**4.** Conclusion:

**5.** I will share my findings by: