



## Science: Design Down Unit for Conservation of Energy and Resources

When planning, it is essential to incorporate the accommodations and/or modifications that are found in students' IEPs. It is also crucial to consider the ESL/ELD stage of English Language Learners when considering how to accommodate and/or modify to meet their educational needs.

<b>Subject:</b> Science	<b>Strand:</b> Understanding Earth and Space Systems	<b>Unit:</b> Conservation of Energy and Resources
<b>Big Ideas</b>		
<p><i>Energy</i> — Energy sources are either renewable or non-renewable. (Expectation 3)</p> <p><i>Sustainability and Stewardship</i> — Energy can neither be created nor destroyed, but it can be transformed. (Expectations 2 &amp; 3)</p> <ul style="list-style-type: none"> <li>- Choices about using energy and resources have both immediate and long-term impacts. (Expectation 1)</li> <li>- Conservation (reducing our use of energy and resources) is one way of reducing the impacts of using energy and resources. (Expectation 1)</li> </ul>		
<b>Overall Expectations (Ontario Curriculum)</b>		
<ol style="list-style-type: none"> <li>1. Analyse the immediate and long-term effects of energy and resource use on society and the environment, and evaluate options for conserving energy and resources</li> <li>2. Investigate energy transformation and conservation.</li> <li>3. Demonstrate an understanding of the various forms and sources of energy and the ways in which energy can be transformed and conserved.</li> </ol>		
<b>Essential Skills</b>		

Academic	Learning
<ul style="list-style-type: none"> <li>- Investigate different types of energy through hands-on stations (energy is neither created nor destroyed).</li> <li>- Research energy sources using Nelson Guided Reading (The Winds of Change, Riding the Sun, Zoo Doo) and Science and Technology (Conservation of Energy –Hydro) and Energy Revolution Series (Biomass: Fueling Change, Generating Wind Power) to prepare a presentation to share in a jigsaw format—must impart to jigsaw group what it is, how the energy is captured, uses of the power, benefits and drawbacks of using the energy.</li> <li>- Present knowledge with a strong and confident voice</li> <li>- Accurately interpret charts and bar graphs</li> <li>- Effectively employ graphic organizers</li> </ul>	<ul style="list-style-type: none"> <li>- Initiative</li> <li>- Co-operation</li> <li>- Class participation</li> <li>- Conflict Resolution</li> <li>- Goal Setting</li> <li>- Use of Information</li> </ul>

**Culminating Task**

Create a labeled poster illustrating an energy efficient home and present work using a strong voice in non-fiction writing using appropriate science and technological vocabulary.

Assessment For Learning 1	Assessment For Learning 2	Assessment For Learning 3
<p>Advantages and disadvantages of energy (Wind, solar, water and biomass) and give one example of how it is used</p>	<p>Public Service Radio Announcements to inform the community of the benefit of recycling, composting, conserving electricity, water, reducing pollution (see page 55 of Nelson Anthology for specific topics)—announcement must include what action to take, who supports it, persuade people to take action and feel good about taking action.</p>	<p>List of 10 things (minimum) to make their homes more energy efficient such as energy star appliances, triple glazed windows, rain barrels, R-rated insulation, building materials such as concrete, lamps on timers, programmable thermostats, high-efficiency furnaces, insulated water heaters, solar panels, weather stripping, radiant heated floors, low-flush toilets, devices on power bars that are turned off and unplugged, low flow showerhead</p>

Lesson 1		Say	Write	Do
What is energy? Get group to define. Introduce the concept of energy using hands on centres and recording chart (name of the object, observations re its functioning, type of energy used.) There are different types of energy.		Debrief experience. Using Science and Technology (Addison-Wesley) Conservation of Energy pages 8 & 9—Record definitions and examples of real-life applications of the different types of energy.		
Accommodations for Lesson 1				
Name				
Modifications for Lesson 1				
Name				
Lesson 2		Say	Write	Do
Energy is neither created nor destroyed but transformed from one form to another. Science and Technology Conservation of Energy pages 10-13 or Hands on Science 202-205 Complete chart.				
Accommodations for Lesson 2				
Name				
Modifications for Lesson 2				
Name				
Lesson 3		Say	Write	Do
Renewable Versus Non-Renewable Forms of Energy Nelson Conservation of Energy Anthology – Energy Sources pages 46-48. Journal entry to record understanding of renewable and non-renewable energy sources.				
Accommodations for Lesson 3				
Name				
Modifications for Lesson 3				
Name				
Lesson 4		Say	Write	Do
Fossil Fuels what it is, how the energy is captured, uses of the power, benefits and drawbacks of using the energy. Hands on Science—Fossil Fuel: Computer Project page 208-209 (Adapt format) Oil, Coal and Natural Gas				
Accommodations for Lesson 4				
Name				
Modifications for Lesson 4				
Name				

**Lesson 5** Say ■ Write ■ Do ■

Debrief of Fossil Fuel Research refer to Science and Technology Conservation of Energy Pages 22-23 to round out student notes and move onto nuclear energy—what is it, how the energy is captured, uses of the power, benefits and drawbacks of using the energy.

Accommodations for Lesson 5

Name

Modifications for Lesson 5

Name

**Lesson 6** Say ■ Write ■ Do ■

Renewable Sources of Energy—Jigsaw activity where students research wind, solar, water or biomass in small groups to prepare to teach other students the information regarding what it is, how the energy is captured, uses of the power, benefits and drawbacks of using the energy. (3 periods) Information for wind, sun and biomass comes from Nelson Guided Reading and water comes from Addison-Wesley. Questions that need to be answered. 1) What is it? 2) How is it captured? 3) How is it used? 4) Advantages and Disadvantages

Accommodations for Lesson 6

Name

Modifications for Lesson 6

Name

**Lesson 7** Say ■ Write ■ Do ■

Nelson Times have Changed pages 60-63 Write about how technology makes our life simpler and more complicated.

Accommodations for Lesson 7

Name

Modifications for Lesson 7

Name

**Lesson 8** Say ■ Write ■ Do ■

Service Announcement Nelson Power of Caring pages 56-57

Accommodations for Lesson 8

Name

Modifications for Lesson 8

Name

**Lesson 9** Say ■ Write ■ Do ■

Nelson Energy Conservation Begins at Home page 65-68. Begin recording ideas regarding conservation of energy in the home. Homework: Continue to research ways to make a home more energy efficient rain barrels, ceiling fans, energy efficient light, etc.

Accommodations for Lesson 9

Name

Modifications for Lesson 9

Name

Lesson 10

Say ■ Write ■ Do ■

Begin culminating activity listed above (4 periods)

Accommodations for Lesson 10

Name

Modifications for Lesson 10