

# Alternative Energy

**Objective:** To learn about alternative energy, analyze solar data.

**Introduction:** Solar generation is being introduced in Northern communities as a wave to reduce reliance on diesel electricity generation. The strength of this technology is in its renewability and decrease on dependence of shipped materials, however, it is also subject to presence of sunlight. This lesson helps students research this type of solar energy and how much can be produced by a Northern array (Colville Lake).

## Curriculum Connections:

B 1.1 sts, C 2.3sts, C2.3s

## Supplies / Materials:

- Computer access

**Hook:** Watch video about solar energy – e.g.

<https://www.youtube.com/watch?v=x4CTceusK9I>

**Intro Activity:** Ask students what they know about alternative energy and how feasible they think it is for their community. What are some of the benefits/challenges of living in the North?

## Main Activity:

1. Have students read through the description of Colville Lake's solar energy description (Resource 1)



## SCIENCE FOCUS

### Lesson Subject

Physics 20

### Topic

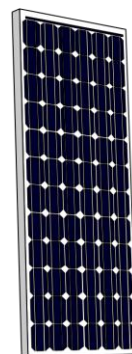
Solar Energy

### Location

Classroom

### Length

50 mins



2. Have students look at solar generation for different days/months in 2015 using Resource 2. When is this most efficient? How much of the potential is being reached? (Note that there is a little tab on the left hand side of the page to change between daily and monthly data)
3. Assuming diesel generators produce 1kW-hr/L of diesel (Resource 3), how much diesel is being saved?

**Independent Student Work:** Energy Consumption Calculator: Have students work out an energy budget for a day (**Resource 4**). How much solar would need to be generated to support their lifestyle? How big would the array and batteries have to be? Give your students lots of time to complete this activity, if they are unable to finish during class time, perhaps collect their work and extend it into the start of your next class.

**Follow up lesson for next day:** when students return to class with their completed energy budget lead a classroom discussion. Ask the following questions; how could they be more efficient? What sacrifices would they make? What alternatives are possible?

**Conclusion / Review:** Have students prepare a poster, presentation or letter to their family to share their findings. Cover questions such as what are the pros and cons of solar energy? How can we save energy overall?

**Homework:** Finish personal energy budget and determine ways to save energy and/or locations for solar in your community.

#### **Resources:**

1. Description of solar energy project in Colville Lake : [http://www.bullfrogpower.com/wp-content/uploads/2015/09/Colville\\_Lake-Solar.pdf](http://www.bullfrogpower.com/wp-content/uploads/2015/09/Colville_Lake-Solar.pdf)
2. Solar energy data for Colville Lake (note only 1 of 2 arrays is being monitored as of Mar 2016): [https://enlighten.enphaseenergy.com/pv/public\\_systems/xrDs481206/overview](https://enlighten.enphaseenergy.com/pv/public_systems/xrDs481206/overview)
3. Diesel generators: [http://energyeducation.ca/encyclopedia/Diesel\\_generator](http://energyeducation.ca/encyclopedia/Diesel_generator)
4. Energy consumption calculator: <https://www.easycalculation.com/physics/electromagnetism/energy-consumption.php>