

Pictou County Forest School - Grade 9 Lesson Plans
Electricity, Energy, and the Environment

Activity: Passive Solar Shelters/Cookers (suggested time 120 minutes)

Overall Curriculum Outcome:

- Learners will propose a course of action that reduces the consumption of electrical energy (113-9, 113-13)
- Learners will give examples of the development of alternative sources of energy (such as wind generators, wood chips, and solar energy) that are a result of cost and the availability and properties of materials (109-6)

Elaborations—Strategies for Learning and Teaching

- Examples of alternative sources of energy, such as windmills, solar panels, and wood chips, can be highlighted and discussed when investigating and exploring sources of electrical energy. These sources can be compared and contrasted in terms of cost, efficiency, and impact on the environment.

Materials:

- Found natural materials
- Hay bales(if available/deemed necessary)¹
- Solar cookers
- Food stuffs: water, rice, pasta, sauce etc.

Intro/Activation:

Do a quick lesson on the concepts of North/South/East/West and how to establish these compass points when outside. Talk about how access to the sun affects: eco-systems; microclimates (north/south side of a tree); positioning of housing in relation to solar gain etc.

Hike to several locations where students will get to feel first-hand the effects of solar gain. For example:

- north/south side of a hedgerow; cool dark hemlock forest vs sunny pasture
- Heat sinks: warm rocks baked in the sun; south-facing slopes
- Cool hollows or blow-down tree roots

Activity:

In groups of 3-4, students are tasked with the following challenges:

- creating a passive solar shelter using natural materials
- cook a simple meal using solar cookers

Reflections/further wonderings:

- What changes and/or modifications would we make?
- Site location: Is a good housing site also a good cooking site?
- What bought/unnatural materials would really help with our heat retention/generation? (e.g., clear plastic tarps). Are these worth the trade offs? (e.g., petro chemicals used to create plastic tarp vs. energy saved by created an energy efficient living space)

¹ It could be interesting to divide the group in half where one group builds a survival shelter using natural materials and the other group uses hay bales to mimic the building of a passive solar straw-bale house. What are the pros/cons of each?