

**Standards-Based Lesson Planning
Springfield Middle Schools**

Standard(s): Science and Technology/Engineering

Strand#3: Physical Science

Learning Standard #13: Differentiate between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.

Standard(s): English Language Arts

Strand: Language

Learning Standard #2: Questioning, listening, and contributing – Students will pose questions, listen to the ideas of others, and contribute their own information or ideas in group discussions or interviews in order to acquire knowledge.

Desired Results

Scope and Sequence

Topic: Winter Survival: Forms of Energy

Suggested Time Frame: Two day outdoor environmental education experience at **ECOS (Environmental Center for Our Schools)** in Springfield, MA

Essential Questions

**Content and Skills
(Progress Indicators)**

What is the difference between potential and kinetic energy?

- Contrast potential and kinetic energy.
- Give examples of potential and kinetic energy.
- Demonstrate how potential energy can be converted into kinetic energy and vice versa.

Assessment Evidence

- Students will show they understand the difference between potential and kinetic energy by using something from the forest, e.g., picking up a branch and letting it fall, rolling a snowball, burning a log..
- Students will be stopped and asked to define kinetic and potential energy before taking a ride down “Kinetic Hill” or walking up “Potential Way”. During the trips up and down the hill, students will be stopped and asked to explain the energy conversions happening in the activity.

Learning Activities

- Students will observe modeling of potential and kinetic energy.
- Students will brainstorm other forms of kinetic and potential energy.
- On days with a snow cover, students will slide down “Kinetic Hill” on sleds made of plastic bags. A sign reading “Kinetic Hill” will be posted on the hill going down. Another sign reading “Potential Way” will be posted on the trail going up the hill.
- Using various methods, students will discover ways of achieving longer and faster trips downhill.