

SOLAR WINDS AND SOLAR ENGINES

Lesson Summary:

Students develop a hypothesis, perform an experiment to test the hypothesis, and collect data. They observe the loss of heat from a lamp over various distances.

Objectives:

The student will:

- differentiate between qualitative and quantitative data;
- discover the role distance plays in the dissipation of energy from a heat or light source; and
- conclude that solar wind dissipates as it travels away from the sun.

GLEs Addressed:

Science

- [5] SA1.2 The student demonstrates an understanding of the processes of science by using quantitative and qualitative observations to create inferences and predictions.
- [6] SA1.2 The student demonstrates an understanding of the processes of science by collaborating to design and conduct simple repeatable investigations.
- [7] SA1.2 The student demonstrate an understanding of the processes of science by collaborating to design and conduct simple repeatable investigations, in order to record, analyze (i.e., range, mean, median, mode), interpret data, and present findings.
- [8] SA1.2 The student demonstrates an understanding of the processes of science by collaborating to design and conduct repeatable investigations, in order to record, analyze (i.e., range, mean, median, mode), interpret data, present findings.
- [7] SB2.1 The student demonstrates an understanding of how energy can be transformed, transferred, and conserved by explaining that energy (i.e., heat, light, chemical, electrical, mechanical) can change form.
- [11] SD3.2 The student demonstrates an understanding of cycles influenced by energy from the sun and by Earth's position and motion in our solar system by exploring causes and effects related to phenomena (e.g., the aurora, solar winds, Coriolis Effect).
- [5] SG2.1 The student demonstrates an understanding of the bases of the advancement of scientific knowledge by reviewing and recording results of investigations into the natural world.

Math

- [5] PS-4 The student demonstrates an ability to use logic and reason by drawing logical conclusions about mathematical situations (given a rule or generalization, determining whether the example fits); or justifying answers and mathematical strategies as reasonable (M9.2.1, M9.2.2, & M9.2.3).
- [7] PS-4 The student demonstrates an ability to use logic and reason by using informal deductive and inductive reasoning in concrete contexts or stating counterexamples to disprove statements; or justifying and defending the validity of mathematical strategies and solutions using examples (M9.3.1, M9.3.2, & M9.3.3).
- [8] PS-4 The student demonstrates an ability to use logic and reason by generalizing from patterns of observation (inductive reasoning) about mathematical problems and testing using a logical verification (deductive reasoning); or justifying and defending the validity of mathematical strategies and solutions using examples and counterexamples (M9.3.1, M9.3.2, & M9.3.3).
- [7] PS-5 The student demonstrates the ability to apply mathematical skills and processes across the content strands by using real-world contexts such as science, humanities, peers, and community (M10.3.1 & M10.3.2).
- [8] PS-5 The student demonstrates the ability to apply mathematical skills and processes across the content strands by using real-world contexts such as science, humanities, peers, community, and careers (M10.3.1 & M10.4.2).

Search Terms:

radiometer, solar wind, solar engine, energy, qualitative, quantitative, sun, measurements, observation

