

Energy Grade 6 Evaluation

Teacher Section

Overview: Kids will demonstrate how well they understand important key concepts from this section.

Suggested Time: 45-60 minutes

Objectives: Students will be tested on the key concepts:

- Energy and matter have multiple forms and can be changed from one form to another.
- Energy comes from the sun to the Earth in the form of light.
- Sources of stored energy take many forms, such as food, fuel, and batteries.
- Machines and living things convert stored energy to motion and heat.
- Energy can be carried from one place to another by waves, such as water waves and sound, by electric current, and by moving objects.
- Heat moves in a predictable flow from warmer objects to cooler objects until all objects are at the same temperature.
- Energy can be carried from one place to another by heat flow, or by waves including water waves, light and sound, or by moving objects.
- When fuel is consumed, most of the energy released becomes heat energy.
- Heat flows in solids by conduction (which involves no flow of matter) and in fluids by conduction and also by convection (which involves flow of matter).
- The sun is the major source of energy for phenomena on the Earth's surface, powering winds, ocean currents, and the water cycle.
- Solar energy reaches Earth through radiation, mostly in the form of visible light.
- The utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Students will also demonstrate these principles:

1. Collecting and interpreting data from an experiment
2. Making valid observations based on their actions in lab
3. Energy is not completely used up, but only takes different forms.

Materials (one set for entire class)

- Weight (like a rock)
- Dowel or yardstick
- Tape (to keep the rock on the yardstick)
- Something that weighs 100 grams (like an apple)
- A meter stick
- A calculator
- Scale

Lab Preparation

1. Print out copies of the student worksheets, lab practical, and quiz.
2. Have a tub of the materials in front of you at your desk. Kids will come up when called and demonstrate their knowledge using these materials.

Lesson

The students are taking two tests today: the quiz and the lab practical. The quiz takes about 20 minutes, and you'll find the answer key to make it easy to grade.

Lab Practical

Students will demonstrate individually that they know how to create a simple machine that could theoretically help them do work. While other kids are waiting for their turn, they will get started on their homework assignment. You get to decide whether they do their assignment individually or as a group.

Students will also demonstrate individually that they know how to measure energy output and work with the specific unit of Joules. While other kids are waiting for their turn, they will get started on their homework assignment. You get to decide whether they do their assignment individually or as a group.

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Student Worksheet

Overview: Today you're going to take two different tests: the quiz and the lab practical. You're going to take the written quiz first, and the lab practical at the end of this lab. The lab practical isn't a paper test – it's where you get to show your teacher that you know how to do something.

Lab Test & Homework

1. Your teacher will call you up so you can share how much you understand about energy and how it works. Since science is so much more than just reading a book or circling the right answer, this is an important part of the test to find out what you really understand.
2. While you are waiting for your turn to show your teacher how much of this stuff you already know, you get to get started on your homework assignment. The assignment is due next week, and half the credit is for creativity and the other half is for content, so really let your imagination fly as you work through it. Choose one:
 - a. Write a short story or skit about inventing a machine that uses simple machines from the perspective of the machine (like a pulley, wedge, screw, ramp, lever, or wheel and axle). You'll read this aloud to your class.
 - b. Make a poster that teaches the main concepts of simple machines. When you're finished, you'll use it to teach to a class in the younger grades and demonstrate each of the principles that you've learned, and give examples of a perpetual machine and why it won't work ... ever.
 - c. Write and perform a poem or song about simple machines. This will be performed for your class.