

Teacher's Guide Grade 5: Energy Conversions



TEKS 5.6 Force, Motion, and Energy: The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:

A) explore the uses of energy, including mechanical, light, thermal, electric, and sound energy.



Background Information: In this unit, students continue to explore different forms of energy, including mechanical, light, thermal/ heat, chemical, electrical, and sound. This year, the focus is on how the different forms of energy are used. Students discover that electricity is the form of energy we use most because it is easily converted to other forms of energy. Other forms of energy can also be used to generate electricity.

Students learn that the amount of energy is constant, meaning energy can be used and converted from one form to another, but it cannot be created or destroyed. It just keeps changing from one form to another.



Prerequisite Knowledge: Prior to this year, students have explored different forms of energy such as light, heat, and sound. They know that energy has the ability to cause change or make things move. They also know that different forms of energy can be observed using their senses.

By now, students know and are able to predict the effects on an object by increasing or decreasing the amount of light, heat, and sound energy, such as how the color of an object appears different in dimmer light or how heat can melt a substance.

Students should be able to differentiate among forms of energy, including mechanical, sound, electrical light, and heat/thermal. They have experience measuring and recording data in metric units using tools, such as Celsius thermometers, spring scales, and metric rulers.



Common Misconceptions: Energy is an abstract concept for students at this age. Energy cannot be seen, but students can observe the changes it

causes in matter. It is important for students to understand how important energy is in its different forms in our daily lives.

Students often think that heat and temperature is the same thing. Temperature is the measurement of how hot or cold a substance is, while heat is the transfer of thermal energy from an object or substance at a higher temperature to an object or substance at a lower temperature.

A common misconception students may have is that cold is a form of energy when it is actually a lack or an absence of heat energy.

Students may confuse energy and force. Force is a push or a pull that can change the speed and direction an object moves. Energy provides the power that makes force possible.



Essential Questions:

1. What are some different forms of energy?

Different forms of energy include thermal, mechanical, electric, sound, light, and heat.

2. How do we use energy in our daily lives?

Every action requires energy. Chemical energy in the food we eat is transformed into mechanical energy when we move and into heat energy that keeps us warm. Heat energy is used to heat our homes and cook food as well as to produce electricity by burning fuels, such as wood. Light energy makes it possible for us to see and sound energy makes it possible for us to hear. Light energy is also used by plants to make food during photosynthesis. (There are many different examples students can give.)

3. A computer converts electricity into what other forms of energy?

The electrical energy that powers a computer is converted to light, sound and heat by the computer.



Notes: