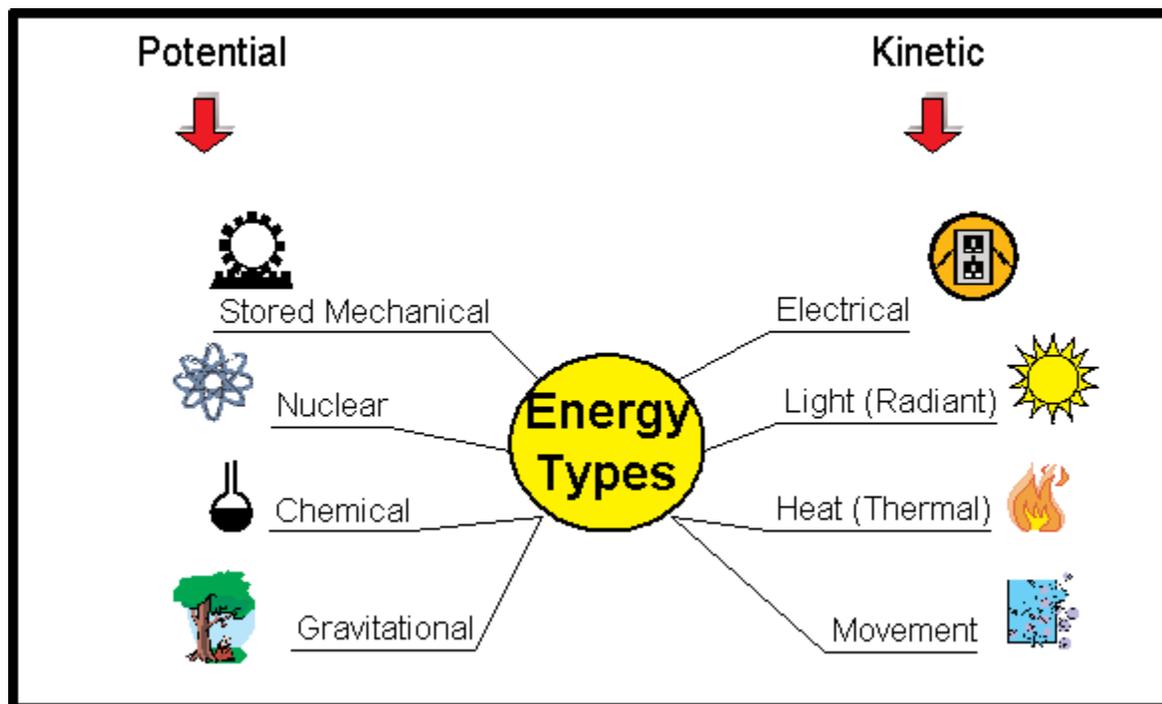


Types of Energy

Step 1: Excite

We are greatly dependent upon energy. God gave us several forms of natural energy to help us live productively on earth. He gave man the intelligence to learn how to use different forms of energy in creative ways. During this unit we will examine different energy types: God is the creator of the world and the producer of all its whole being or substances, including these energy types (Psalms 19:3-6). Everything that moves requires energy. The types of energy are listed in the illustration.

Brainstorm and list ten types of energy in use in your home (kitchen appliances, power tools, lights, heating) then discuss how the energy is used to make something work. Where would each item fit into the illustration below?



Click on any image above to view more information.

Underlined text refers to Internet link.

Examples: Your refrigerator is probably powered by electrical energy. Your stove might be powered by natural gas (chemical energy). Your lights might be powered by nuclear energy (depending on where you live). Food and fuel both store chemical energy. Many items require more than one energy type. For example, a car requires chemical energy (gasoline) to run its motor which is an example of mechanical energy.

Step 2: Examine

Energy is defined as “the ability to do work.” Work and energy may seem like very much the same thing. However, while they are similar, they’re not the same. Remember that *work* is a force that is acting by or through a distance. *Energy* is simply the ability to do that work. Almost everything we do is connected to a form of energy. The sun produces light and the energy to make plants grow. Our bodies produce energy from food. Energy powers our vehicles, warms our homes, plays our music, lights our cities, and powers machinery in factories and farms.

Potential and Kinetic Energy

The illustration on the previous page divides the different forms of energy into two types: Potential and kinetic.

Potential Energy

Potential energy is stored energy. It is the energy that exists within an object. It is the stored energy of position possessed by an object. The following are potential forms of energy:

- **Stored Mechanical Energy** - the energy which is possessed by an object due to its stored energy of position. Rubber bands and springs are good examples of stored mechanical energy.
- **Nuclear Energy** - energy locked in the nucleus of the atom. Nuclear power plants split atoms in a process called fission.
- **Chemical Energy** - the energy stored in food, wood, coal, petroleum, and other fuels.
- **Gravitational Energy** - energy stored as a result of gravitational forces concentrated by the earth for the object. A water held back by a dam is an example of gravitational energy.

Energy

Gasoline (chemical energy) in a car is potential energy. Every time we drive, we use potential energy (fuel) in order to get kinetic energy (speed). In the same way, God powers our movements; just as that energy required for our actions comes from the food (chemical energy) that we consume.

Kinetic Energy

Kinetic energy is the energy of motion. When you are walking or running, your body is exhibiting kinetic energy. **The following energy types are kinetic:**

- **Electricity** - energy produced when something upsets the balancing force between electrons and protons in atoms.
- **Light or Radiant Energy** - waves that emit energy. Examples include: radio and television waves, gamma rays, and x-rays.
- **Heat or Thermal Energy** - created by heat. The hotter an object becomes and the more thermal energy it possesses.

As the power of potential energy uncoils, it transforms the energy source into kinetic energy. Remember, kinetic energy is the energy of the motion. The faster a body moves, the more the kinetic energy is formed as a process of movement. For example, when a train speeds up going down a hill, the potential energy of the train converts into kinetic energy. There is not much potential energy at the bottom of the hill, but there is a great amount of kinetic energy. Does God speed up trains? In a sense, yes, because He made fuel by creating life, burying it in the Great Flood, and causing massive forces in the earth's crust to change those elements into fuel.

This lesson is an overview of potential energy, kinetic energy, and energy types. You will look at each in detail in later lessons. Research the different types of energy. Use any resource (an encyclopedia, reference book, or the Internet). We recommend the following:

Books

  [Eyewitness Energy](#)  
Read: "What is Energy?" (6-7).

 [Exploring Creation with Physics](#)  
Read: "Work and Energy" (289-301).

Underlined text refers to Internet link.

Internet Sources

Energy Quest

Description: Energy Quest is the award-winning energy education Web site of the California Energy Commission.

<http://www.energyquest.ca.gov>

Types of Energy

Description: Redding Electric Company gives a clear, concise overview of chemical, mechanical, heat, electrical, and nuclear energy.

<http://redding.apogee.net/kids/allabout/kctype.htm>

Energy Resource Materials for K-12

Description: At this site you will find student and teacher workbooks on several levels from the National Energy Education Development. The NEED program includes curriculum materials, professional development, evaluation tools, and recognition. NEED teaches the scientific concepts of energy and provides objective information about energy sources—their use and impact on the environment, the economy, and society.

<http://www.need.org/guides.htm>

What is Energy?

Description: Energy educational material for students of all ages and grades explains energy's different forms—heat (thermal), light (radiant), mechanical, electrical, chemical, and nuclear energy, and two types of energy—stored (potential) energy and working (kinetic) energy.

<http://www.eia.doe.gov/kids/whatsenergy.html>

The Physics Zone: Work, Energy and Power

Description: Three separate slide shows on work, power, and energy.

<http://www.sciencejoywagon.com/physicszone/lesson/05work/workpower.htm>

Introduction to Energy

Description: An introduction to energy explaining the different forms. <http://id.mind.net/~zona/mstm/physics/mechanics/energy/introduction/introduction.html>

Energy Focus!

Description: An introduction to energy explaining the six forms.

<http://www.learnaboutenergy.org/focus/part1.htm>

Energy Experiments

Description: This Web site discusses basic energy concepts and experiments to reinforce those concepts.

<http://library.thinkquest.org/2745/data/openpark.htm>

Step 3: Expand

Choose and complete at least one of the following activities. Experiments should be conducted under the supervision of your elders.



Activity 1: Make a Story Board

Make a story board showing which energy powers each of the items below. Refer to [Making a Story Board](#).

windmill	fossil fuels	sailboat	lamp
waterwheel	fireplace	greenhouse	coal
hair dryer	refrigerator	flashlight	windup toy
car	train	dam	person



Activity 2: Create an Energy Log

Think about all the forms of energy you use. Keep a logbook and plot all the different ways you use energy resources for one day.



Activity 3: Experiment

Materials required: a) Balls (or bean bags) b) Indoor bowling pins (or empty 2 liter soda bottles). Procedure: Brainstorm forms of energy—light, heat, electricity, chemical, nuclear, motion—wind, water. Now hold the ball and remember that it has potential energy. When you roll the ball to hit the pins, its potential energy changes to kinetic energy. This is a good example of the fact that potential energy is stored energy, while kinetic energy is energy in action. Compare and contrast potential and kinetic energy. Determine similarities and differences of change in energy in household items. Record your observations using a [Lab Sheet](#).



Activity 4: Scrapbook

Find illustrations of examples of each energy type (stored mechanical, nuclear, chemical, gravitational, electrical, light, heat, and movement) on the Internet (or copy illustrations from a book). Print out illustrations in color (or color with markers). Make one [scrapbook](#) page titled “Potential Energy” and one titled “Kinetic Energy.” Place the

Underlined text refers to Internet link.

images on the appropriate page in a logical sequence or where they are visually appealing. Consider adding color to your page by matting images with colored paper or a border. Use construction paper, special scrapbooking stationary, etc. Or draw a frame with a marker. Crop images in unique shapes. Decorate your page using scrapbooking tools: use die cuts, sticker, paper trimmers, borders, etc.



Activity 5: Paraphrase or Copy

[Paraphrase](#) or copy from one of your resources one paragraph on types of energy. Younger students can orally narrate what they learned from the text. Draw icons to represent each energy type.

Step 4: Excel

In the “Above All Power” lesson you should have memorized [Eph. 3:17-20](#). Recite it now. If you do not remember it copy the verse three times to help you memorize it.

Share the activity you completed in Step 3 with at least two people. Correct all written work to demonstrate correct punctuation and spelling, and effective use of grammar. Add corrected written work or any illustrations to your Portfolio.