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***What is Energy?***

***Directions:***

Go to the following link: <http://www.energyeducation.tx.gov/energy/section_1/topics/index.html>.Use the web page to help learn about energy and its ability to transform from one form to another. As you navigate through the site, please answer all questions below.

1. Energeia is the greek word for energy, meaning in or at work. In physical science, energy means the ability to do work.
2. Work means a change in position, speed, state, or form of matter. Therefore, energy is the capacity to change matter.

**Click on the arrow at the top right of the page, then click on each picture listed.**

1. There are roughly ten examples of how humans use energy listed on this page. In the space below, please list five examples that you read about.

* Getting up
* Going to school
* Doing chores
* Turning on a motor
* Drive a car
* Cook on a stove
* Switch on a light

**On the left side of the page, there are links listed. Please click on the link labeled Potential & Kinetic energy.**

1. All energy can be in one of two states. What are they?

Potential energy or kinetic energy

1. What is potential energy? Give an example.

It is stored energy. A lawn mower filled with gasoline.

1. Why does the car shown in the picture have potential energy?

It is not moving but it has gasoline in it.

1. What is kinetic energy? Give an example.

Energy at work. A car racing down a hill.

1. Click on “The Energy Transfer of a Pendulum” video. Can you describe what you see in terms of kinetic and potential energy? (hint: when does the pendulum have the most potential energy? When does it have kinetic energy?)

When the ball is at the top, it has potential energy. When it is at the middle/bottom, it has kinetic energy.

1. List the six forms of energy below. In your own words, explain/define what each form is.

* Mechanical: When a substance or system has energy because it is in motion.
* Nuclear: When the nuclei of atoms are split or fused and energy is released.
* Chemical: Stored energy within the bonds between molecules.
* Radiant: Energy related to the movement of light, electromagnetic waves, or particles.
* Electrical: Energy made available by the flow of electric charge through a conductor.
* Thermal: When moving or vibrating molecules give off energy that is heated.

1. All forms of energy can be transformed from one form to another. Below, please give one real-life example of how energy is transformed from one form to another.

An automobile engine converts the thermal energy in a fuel into mechanical energy.

1. What does the **law of conservation of energy** state?

The total amount of energy in a system remains constant, although energy within the system can be changed from one form to another or transferred from one object to another.

1. While on the Law of Conservation page, click on the green button that’s says “FYI: Can Energy Disappear?” Describe how a rollercoaster uses energy to move/work.

The car is pulled to the highest part of the track. When it is at the top, it has potential energy. As the car begins to go down the steep track, some of the potential energy changes to kinetic energy. When the car gets to the bottom of the track, all the potential energy changes to kinetic energy. When it climbs to the top of the next hill, the kinetic energy changes back to potential energy. And it keeps doing that until the end of the ride. The car usually gains enough kinetic energy to be able to climb a hill by itself. Some of the energy turns into heat, though, because of friction. Each hill in the ride is a little smaller than the one before it to reduce the amount of heat.

1. Click on Energy Control Systems on the left hand menu. What are the three parts of every energy control system?
2. The original source of energy
3. All the conversions the energy goes through.
4. The use of the energy.
5. **CHALLENGE: (+5)** What is an endothermic reaction? What is an exothermic reaction? Where does the energy go in each reaction? Think about thermal or heat energy.

The endothermic process describes a process or reaction in which the system absorbs energy from its surroundings in the form of heat.

An exothermic reaction is a chemical or physical reaction that releases heat.