Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chapter 11

Work and Energy

Notes

Bellringer

What is energy and how do we use it??

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Potential energy**

* Energy is the ability to do work. Stored energy is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* It has potential to do work in the future. It had potential to move.
* A roller coaster at the top of a hill also has potential energy. It can move down the hill in the future.

**Write an example of potential energy.**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Kinetic energy**

* When an object is moving, it has energy of motion. This is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Potential energy can change into kinetic.
* A roller coaster has kinetic energy when it moves up or down a hill. When it begins to roll down the hill the potential energy changes into kinetic.

**Write an example of kinetic energy!**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Energy has different forms.**

* Energy has different forms.
* Chemical
* Electrical
* Mechanical
* Light
* Nuclear energy
* Thermal

**Chemical energy**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is stored in food and fuel. When you eat food, you get the food’s chemical energy. You use it to move and grow.

**Electrical energy**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ comes from moving charged particles. Most electricity comes from power plants that burn fuel. Electricity is then sent throughout wires to homes and schools.

**Mechanical energy**

* Mechanical is the energy of an object. When an object moves, the object has kinetic energy. The movement of the object gives it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A roller coaster car at the top of a hill also has mechanical energy. It has potential mechanical energy.

**Light energy**

* The sun, lamps, fires, and lasers are sources of light energy. Plants use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for photosynthesis. They use the light energy to make food.

**Nuclear energy**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** comes from tiny particles of matter. When the particles split apart or join, a lot of energy is given off.
* Nuclear energy powers the sun and light energy is what it gives.

Thermal energy

* A burning match has **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.** The fire gives off heat. The more thermal energy a substance has, the warmer it is.

**Quick Check**

1. particles of matter that split apart \_\_\_\_\_\_\_\_\_\_\_.
2. a hot oven \_\_\_\_\_\_\_\_\_\_\_\_\_.
3. a windup toy \_\_\_\_\_\_\_\_\_\_\_\_.
4. a laser \_\_\_\_\_\_\_\_\_\_\_\_.
5. moving charged particles \_\_\_\_\_\_\_\_\_\_\_\_.
6. stored food in a plant \_\_\_\_\_\_\_\_\_\_\_\_\_.

**Simple Machines**

* A machine is anything that helps you do work. A simple machine has only a few parts. A pully is a simple machine. Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are the lever, the wheel and axle, the inclined plane, and the wedge.

**Levers**

* A painter can use a screwdriver to open a paint can. When he does, he uses the screwdriver as a **\_\_\_\_\_\_\_\_\_**. A lever has two parts: a bar and fulcrum. The fulcrum is a fixed point. It supports the bar and allows it to turn.

**Wheels and Axles**

* A doorknob is an example of a **\_\_\_\_\_\_\_\_\_\_\_** and axle. The axle is a bar that goes through the middle of the wheel.
* You can use a small effort force to turn the wheel. The **\_\_\_\_\_\_\_\_** turns this small force into a larger force. The larger force moves the load.
* Example: Ferris wheel

**Fixed pulleys**

* A **\_\_\_\_\_\_\_\_\_\_** makes it easier to lift a load.
* The wheel of a fixed pulley is attracted to something. One end of a rope goes over the wheel. The other end is tied to the load. The distance the rope is pulled is the same as the distance the load is lifted.

**Wedges and screws**

* Two inclined planes back-to-back form a **\_\_\_\_\_\_\_\_\_\_\_\_.** It changes a downward or forward force into a sideways force. A wedge can be a ram.
* A **\_\_\_\_\_\_\_\_\_** is an inclined plane wrapped around a cylinder. Screws can make holes in wood and metal.