Lesson #100

Potential Energy

There are four types of potential energy. They are **gravitational**, **elastic**, **chemical**, and **electrical** potential energy. The type(s) of potential energy an object has is determined by the force(s) acting on the object. In the example of the ball at the top of the hill, the force acting on the ball is gravitational force. Gravity is a force which pulls objects toward Earth.

In the case of a rubber band, the force is **elastic**. The elastic nature of the material is pulling the rubber band tighter. Stretchy materials and springs have elasticity.

Electrical potential energy results from a build-up of charged particles. **Static electricity** is an example. If you have ever walked across the room to open the door, only to be shocked when you touched the doorknob, then you have experienced one type of electrical potential energy. In this example, as you walk across the floor, excess electrons build up on your feet and spread across your body. You are building up a negative charge. This build-up won't last, though. When you come into contact with an object which has fewer electrons, some of the electrons will pass from your body to that object. When you reach out to touch the doorknob, some of the extra electrons leave your body and move to the doorknob. You become aware of this when you feel a shock.

Chemical potential energy refers to the energy stored inside of molecules. We have talked about this before when we learned about plants storing the sun's energy by making carbohydrates. Other chemicals can also store energy. One of the ways to release this energy is to burn it. Everyday examples of this include burning a candle or using gasoline in our cars. The molecules that make up gasoline are broken down by your car in an process called **combustion**. In doing this, energy is released for your car to use.

1. Match each type of potential energy with the correct description.

_____	chemical	A) energy based on attraction to Earth
_____	elastic	B) energy which comes from the stretchy nature of the material
_____	gravitational	C) energy found stored inside of molecules
_____	electrical	D) energy which develops from the build-up of electrons

2. If kinetic energy is energy of motion, what is potential energy?

energy of position related to opposite charges caused by rubbing

3. The faster an object is moving, the (more / less) kinetic energy it has.

4. Give an example from the reading for each type of potential energy.

Type of Potential Energy	Example
Chemical	
Electrical	
Gravitational	
Elastic	

5. How does a monotreme differ from other mammals?

A) It does not have specialized teeth.
B) It lays eggs instead of giving live birth.
C) Monotremes do not have hair or fur.

6. In what biome do you see very few trees due to permafrost?

tundra rainforest desert

7. There are six animal groups. Three are invertebrates, amphibians, and mammals. List the other three.

A) _____ B) _____ E) _____

8. Which of the following is NOT one of the four basic molecules of life?

carbohydrates proteins graphite DNA

9. What is homeostasis?

A) the ability to maintain a stable internal environment
B) the ability to pass on genetic traits
C) the ability to grow

10. Match each organelle to its purpose.

_____ nucleus A) where the cell's energy is processed

_____ mitochondria B) acts as the cell's communication center

_____ endoplasmic reticulum C) transports proteins throughout the cell