PROPERTIES OF MATTER AND ENERGY

What is matter?

Matter is anything that takes up space and has mass.

Properties of Matter

Mass
Definition: the amount of matter in an object
Tool for measuring: pan balance

Volume
Definition: the amount of space an object takes up
Tool for measuring: graduated cylinder

Weight
Definition: the measure of the pull of gravity on an object
Tool for measuring: spring scale

Density
Definition space or
; density

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Special Properties of Matter

Some matter has the capability of **conducting energy**, such as wires which conduct electrical energy.

Some matter **insulates against energy**, such as a wood handle on a pot that insulates against heat energy so that you can hold a hot pot using the wooden handle and not get burned.

Other properties of matter include **magnetism** which is the property of being magnetic (attracting iron or steel) and **buoyancy**, which is the ability of an object to float.

Energy

Energy is the ability to do work.

Kinetic energy is energy that is happening now; it is energy in motion. The faster an object is moving, the more kinetic energy it has. The more mass an object has, the more kinetic energy it will have.

Kinetic energy can change forms. For example, kinetic energy can change into heat energy when you rub your hands together.

Potential energy is energy that is waiting to happen; it is stored energy. Examples of potential energy include a rubber band being pulled back or someone sitting on the top of the slide – both have the potential to move, but have not moved just yet).

Lesson Checkpoint: What is kinetic and potential energy?

Forms of Energy

Electrical

Electrical e s that care called ricity and lightning.

Thermal E

Thermal en rmal energy is g f the earth.

Chemical Energy

Chemical energy is energy stored in the bonds of atoms and molecules. It's the energy that holds these particles together.

Mechanical Energy

Mechanical energy is the energy an object has due to its motion or due to its position. Mechanical energy can be either kinetic energy (energy of motion, like a rolling ball) or potential energy (stored energy because of an object's position, like an arrow pulled back in a bow).

Radiant Energy

Radiant energy is energy that travels in the form of electromagnetic waves. Radiant energy includes visible light, x-rays, gamma rays, and radio waves.

Lesson Checkpoint: Describe one form of energy.

How does heat get transferred?

- **By conduction** which is the transfer of heat between two objects that TOUCH. For example: When a metal spoon is put inside a cup of hot chocolate, heat travels from the hot chocolate to the spoon because the two are touching and because metal is an excellent conductor of heat.

- **By convection** which is the transfer of heat through liquid or gas. An example of this is a heated pool.

- **By radiation** which is the transfer of heat through electromagnetic waves, such as radiation inside a greenhouse.

Lesson Checkpoint: What is one way heat can get transferred?