

PHYSICS 8: THE PHYSICS OF EVERYDAY LIFE

Homework 1 Solutions

1. List the force which hold the following together:

a) a pencil b) a mountain c) the Earth d) the ocean water.

a) a pencil - electromagnetic (chemical bonding)

b) a mountain - electromagnetic (chemical bonding)
gravity unimportant until scale of about 500mi.

c) the Earth - gravity (primarily; rocks held together by chemical forces)

d) the ocean water - electromagnetic (chemical bonding) of hydrogen atoms to oxygen atoms- gravity holds oceans to the Earth's surface but is not important in holding water molecules together

2. The following words and phrase have precise definitions in physics. Please write definitions for each:

a) Force; b) Law; c) Energy; d) Conservation of Energy.

a) Force:

The rate of change of momentum (mass times velocity), forces manifest themselves, usually, as a push or pull which tries to alter the speed or direction of the motion of a body.

b) Law:

Experimentally verified statement which summarizes behaviour. Usually summarized with equations.

c) Energy:

The capacity to do work. Appears in many different forms.

d) Conservation of Energy:

"Energy is neither created or destroyed, but it can change form."

3. Name 4 devices which change energy from one form to another and give the forms of energy.

Examples:

a. spring: potential energy (of spring stiffness) converted to kinetic energy and back again

b. pendulum: potential energy (of gravity) to kinetic energy and back again

c. car: chemical potential energy to heat and then to kinetic energy

d. heat lamp: electromagnetic energy to thermal energy

4. Please give a 1 page summary of General relativity.

Much could be said. For full credit must have a whole page roughly, and must be in own words. Synthesize information from various sources is best. Internet a great source - be sure to give references!