

Vocabulary

Weight-gravitational force on an object; newtons=standard unit

Mass-is a constant amount of matter; kg=standard units

Kinetic Energy-energy from motion

Potential energy (Gravitational potential energy- $mgh=GPE$;

Electrical potential energy-any object w/ charge

Nuclear potential energy-if it is close enough to another proton/neutron it has nuclear potential energy

Work- force times a distance; $W=fd$; Force over a distance

Machine-device that changes the direction of an applied force

Pulley-changes the direction of the force

Lever-an arm/fulcrum; board and pivot point;

Ramp-allows an object to be lifted over a longer distance which means the amount of force required decreases

Wheel-what does it sound like it means?

Heat-transfer or flow of energy from one body to another; $Q=mc(\text{change in temperature})$

Temperature-measure of the average velocity of all atoms or molecules in an object

Conduction-energy is passed from one molecule to the next through touching; surfaces feel different because of heat transfer abilities

Convection-less dense things rise to the top; the movement caused within a fluid by the tendency of hotter and therefore less dense material to rise, and colder, denser material to sink under the influence of gravity, which consequently results in transfer of heat; occurs in fluids; heating at the bottom causes expansion, less dense things rise, and thus the hot particles rise to the top and the colder, or less dense, particles descend;

Radiation-energy moves in electromagnetic waves; motion of heat across space in the form of electromagnetic waves; doesn't touch, doesn't mix;

Power-Power is energy divided by time; rate at which energy is converted from one form into another
Power times time = Energy

Linear momentum-defined as 'p'; $p=mv$; momentum=mass times velocity; vector

Angular Momentum-defined as 'L'; $L=mv r$; Angular momentum=mass times velocity times radius; vector;

Vectors-direction and speed

Entropy-basically a measure of how disorganized a system is;

Joules= Newtons times meter (Nm)

Energy is the ability to do work

Efficiency=useful energy out/total energy in

Specific heat capacity-the quantity of heat required to change the temperature of a unit mass of the substance by one degree; defined by 'c_p'

Impulse-force times time; $I=ft$; changes momentum $I=(\text{change in } mv)$; $(\text{change in } mv)=ft$

Gravity- $F_g = Gm_1m_2/r^2$; G=the universal gravitational constant;

Scientists

Vera Rubin-there must be a large amount of 'unseen' matter (dark matter); dark matter explains the rotation of galaxies;

Albert Einstein-general theory of relativity-gravity is a curvature of space-time; the sun curves space/time-gravity even bends things w/o mass

Arthur Eddington-showed proof of light being bent-

James Joule-confirmed that energy of motion/heat are equivalent; tracked energy lost to heat; heat is kinetic energy; worked on concepts of heat, energy, and electricity;

Emmy Noether-proved mathematically that energy was always conserved

James Watt-improved the steam engine; unit of work = horsepower (746 Watts); steam engine; Improved steam engine (unit of work);

Sir Isaac Newton-gravity is the attraction of masses to other masses; impulse; if momentum changes the mass or velocity must change; invented calculus; 3 laws of motion; universal gravity;

Aristotle-heavy things fall faster than light things;

Galileo Galilei-experiments showed all things fall at the same rate;