Video: *All of the Energy in the Universe* by TED-Ed

The _____ amount of all the different types of energy in the universe is always the _____.

For chemists, two important types of energy are chemical _____ energy and _____ energy.

Potential energy is energy _____ to happen. Think of a stretched rubber band. If you cut it, all of that potential energy gets _____ to kinetic energy. Chemical bonds also store energy and when those bonds are broken, that potential energy gets converted into other types of energy, like _____ or _____, or gets used to make different bonds.

Kinetic energy is the energy of _____, and molecules are always moving. They're not necessarily going somewhere, though they could be, but they are _____, stretching, bending, and/or spinning. The kinetic energy of molecules is exactly the same type of energy you have when you're moving around, except that you can be still, and molecules can't. If you suck the kinetic energy out of a group of molecules, they'll move less, but they'll never fully stop.

If we calculate the average kinetic energy of a group of molecules, we have a number related to _____. The _____ kinetic energy a group of molecules has, the _____ its temperature.
(notes end at 1:53)

Article: *Kinetic Energy* by The Physics Classroom

Kinetic energy is the energy of _____. An object that has motion - whether it is vertical or horizontal motion - has kinetic energy. There are many forms of kinetic energy - _____ (the energy due to vibrational motion), _____ (the energy due to rotational motion), and _____ (the energy due to motion from one location to another). To keep matters simple, we will focus upon translational kinetic energy. The amount of translational kinetic energy (from here on, the phrase kinetic energy will refer to translational kinetic energy) that an object has depends upon two variables: the _____ (m) of the object and the _____ (v) of the object. The following equation is used to represent the kinetic energy (KE) of an object.

$$\mathbf{KE = \tfrac{1}{2}mv^2}$$

where **m** = mass of object
v = speed/velocity of object

This equation reveals that the kinetic energy of an object is _____ _____ to the square of its speed. That means that for a _____ fold increase in speed, the kinetic energy will increase by a factor of _____. For a _____ fold increase in speed, the kinetic energy will increase by a factor of _____. And for a _____ fold increase in speed, the kinetic energy will increase by a factor of _____. The kinetic energy is dependent upon the square of the speed. As it is often said, an equation is not merely a recipe for algebraic problem solving, but also a guide to thinking about the relationship between quantities.

Kinetic energy is a scalar quantity; it does not have a direction. Unlike velocity, acceleration, force, and momentum, the kinetic energy of an object is completely described by magnitude alone. Like work and potential energy, the standard metric unit of measurement for kinetic energy is the _____. As might be implied by the above equation:

$$\mathbf{1\ Joule = 1\ kg \cdot m^2/s^2}$$