Temperature, Thermal Energy, and Heat

For starters, temperature and heat are not the same thing. __________ is a measure of the ______ kinetic energy of the particles in a sample of matter. By using the word ______, we mean that some of the particles are moving faster than the ______ speed and some are moving slower than the ______ speed. As the speed of the particles increase so too does the temperature increase and vice versa.

So if we have two containers of water of equal ____, but the first container has a temperature of 30 degrees Celsius while the second container as a temperature of 50 degrees Celsius, the speed of the particles in the second container is _____ than in the first container, and therefore have a _____________ kinetic energy.

__________ energy is the ____ energy of the particles in a sample of matter, including both their _____ and _______ energy. The _____ energy is based on the motion of the particles while the _______ energy is based on the forces that act within or between the particles. Thermal energy is also based on the ____ of the sample. The more ____ a sample has means it will have more ______ energy.

Suppose you have a glass of water at room temperature, 20 degrees Celsius. The temperature of the water in your swimming pool is also 20 degrees Celsius. Since there is a larger ____ of water in the swimming pool we say the swimming pool has more ______ energy. Since energy is defined as the ability or capacity to do work or cause change, the water in the swimming pool can do ____ work than the water in the glass. For example, if we're trying to melt ice, the water in the swimming pool, with its larger ____ and greater

______ energy could melt a larger amount of ice then could a glass of water. Just like the units for work, the units for ______ energy are measured in joules.

__________ energy also depends on what ___ of a substance your sample is made out of. If I had a twenty gram sample of copper at room temperature and a twenty gram sample of water at room temperature they would have _______ amounts of ______ energy since they are two _______ substances.

When we are talking about ____, we're referring to ______ energy that flows from something with a _____ temperature to something with a _____ temperature. So if you are holding an ice cube in your hand, your hand feels cold not because the ice cube puts cold into your hand, but because ____ (______ energy) flows out of your hand and into the ice cube. Since the amount of ______ energy in your hand has decreased it causes the _____ of the particles in your hand to ____ down, decreasing the temperature.

To measure changes in ______ energy scientists usually use some type of a _________. Remember that a _________ is a type of insulated container used to study the transfer of ______ energy. A type of _________ called a bomb _________ is used to determine the ______ energy in foods. These units of food energy are called calories. A calorie is the amount of food energy needed to raise one gram of water one degree _____. One thousand of these small calories (small c) is equal to a____calorie (large C). It is these large calories that are used to represent the energy content of foods.