**Energy and Work**

What is the meaning of the term “work”, as it is used in science?

What are the units of work? What are the units of energy?

Explain the difference between “mechanical” energy and “non-mechanical” energy. Give an example of each.

Let's figure out how much work you do every time that you walk up the stairs from the first floor to the second floor! First step-- determine your weight, in Newtons.

Weight in Newtons \_\_\_\_\_\_\_\_\_\_\_\_

Next, determine the HEIGHT of the stairs that you climb to get to the second floor. Work with your partners to figure this out. What units do you need to express the height in?

Height of stairs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If you climb the stairs at a constant speed, what is the size of the force that you must exert on the stairs as you move upwards at a constant speed?????

Use your answer to the previous question and the height of the stairs to find the total work that you do every time that you climb up to the second floor. Please show your work.

**More about energy...**

What is kinetic energy? What is the equation that is used to calculate kinetic energy?

Why does a moving object have “energy”? How can it “do work”??

What is the kinetic energy of a 1000 kg car that is traveling at 25 m/s?

What is “potential energy”? Identify THREE different kinds of potential energy.

In what way does an object with potential energy have energy????

Determine the amount of gravitational potential energy that you gained when you climbed the stairs from the first floor to the second floor.

**Energy and Atoms**

In the Bohr model of the atom, what exactly are the “orbitals” that electrons exist in??

What is a “photon”? What is the role that it plays in the behavior of all atoms?

What happens when an electron in an atom releases energy, so that it “moves” from a “higher” energy level to a “lower” energy level?

What aspect of a photon determines the amount of energy that it carries?

How does a solar panel produce energy? What form is the energy in?

**Chemical Energy**

What is “chemical energy”? How is energy related to the formation of chemical compounds?

Why is “energy” needed to start a chemical reaction??

What does it mean to say that “energy is released” in chemical reactions?

How is nuclear energy different from chemical energy? What happens in a nuclear reaction??

What does Einstein's most famous equation mean?

How do stars like our sun generate energy?