Chem Potential Energy in Covalent Bonds Name:

- 1) Which has more chemical potential energy: two separate oxygen atoms or two bonded oxygen atoms?
- 2) What happens to the chemical potential energy when the atoms bond?
- 3) If you reacted a bunch of chlorine atoms to form chlorine molecules would the substances get hot? What did you see in the computer model to support your answer?

4) Which is more stable, the covalent bond between two hydrogen atoms, or the covalent bond between a hydrogen and chlorine atom? How do you know?

5) If hydrogen atoms and chlorine atoms are placed in a container which atoms will bond with each other the most? Why?

6) If hydrogen molecules and chlorine molecules are placed in a container they will react and heat energy is produced. However, in order for the hydrogen and chlorine molecules to react they first have to break bonds which should absorb heat energy. Explain why heat energy can be produced if this reaction requires both the breaking and making of chemical bonds.

 $H_2 + Cl_2 \dots > 2 HCl$ or $H-H + Cl-Cl \dots > H-Cl + H-Cl$