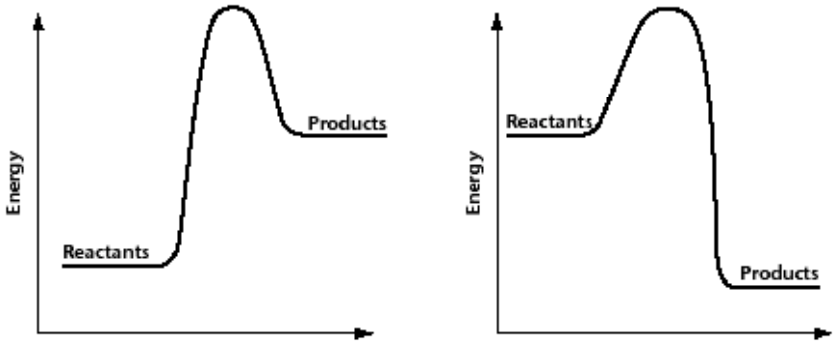
Activation Energy

Complete this worksheet after you finish reading Chapter 15, Section 3.

Activation energy is the energy a reaction needs to get started. At the bottom of the page are two energy diagrams—one for an exothermic reaction and one for an endothermic reaction. Follow the directions below to label the energy diagrams.

1. In an exothermic reaction, the chemical energy of the reactants is greater than the chemical energy of the products. Write *exothermic reaction* under the appropriate energy diagram.
2. In an endothermic reaction, the chemical energy of the reactants is lower than the chemical energy of the products. Write *endothermic reaction* under the appropriate energy diagram.
3. Exothermic reactions give off energy. The energy given off is the difference between the energy of the reactants and the energy of the products. Label the energy given off on the exothermic-energy diagram by writing *energy given off* in the appropriate space.
4. Endothermic reactions absorb energy. The energy absorbed by a chemical reaction is the difference between the energy of the products and the energy of the reactants. Label the energy absorbed on the endothermic energy diagram by writing *energy absorbed* in the appropriate space.
5. The activation energy is the energy needed to start a chemical reaction. On the diagrams below, the chemical reaction begins at the top of the peak. The activation energy is the difference between the top of the peak and the energy of the reactants. Label the activation energy of each graph by writing *activation energy* in the appropriate space.

Energy Diagrams for an Endothermic and an Exothermic Reaction



Review of Chemical vs. Physical Properties and Changes

Chemical vs. Physical Properties.

Chemical properties are properties of an element or compound in chemical reactions. For example, the fact that sodium reacts with water is a chemical property.

Physical properties are properties of an element or compound that can be observed without a chemical reaction of the substance. A substance's color and density are physical properties.

Chemical vs. Physical Changes.

In a physical change, the substances are not altered chemically, but merely changed to another phase (i.e. gas, liquid, solid) or separated or combined.

In a chemical change, the substances are altered chemically and display different physical and chemical properties after the change.

Identify Chemical and Physical Properties : use C or P

Water boils at 100 degrees Celcius.
Diamonds are capable of cutting glass.
Water can be separated by electrolysis into hydrogen and oxygen.
Sugar is capable of dissolving in water.
Vinegar will react with baking soda.
Yeast acts on sugar to form carbon dioxide and ethanol.
Wood is flammable.
Aluminum has a low density.
Ammonia is a gas at room temperature.
Bromine has a red color.

Identify Chemical and Physical Changes: use C or P

Dry ice, solid carbon dioxide, is sublimed at room temperature.
Salt is dissolved in water.
Iron rusts in a damp environment.
Gasoline burns in the presence of oxygen.
Hydrogen peroxide decomposes to water and oxygen.

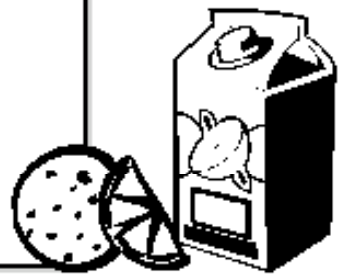
A Simple Solution

Complete this worksheet after you finish reading Chapter 16, Section 2.

Libby Lidmis has been busy gathering information on acids, bases, and salts. Unfortunately, someone mixed up the information on her chart. Each of the pieces of information given below describes an acid, a base, or a salt. Help Libby straighten out her chart by matching each piece of information with the correct categories, and writing it in the appropriate box on the next page. Be careful—some of the pieces of information belong in more than one category.

- taste bitter
- may be corrosive
- used to de-ice roads
- excess hydroxide ions
- found in drain cleaner
- found in plasterboard
- react with baking soda to produce carbon dioxide gas
- change blue litmus to red
- pH less than 7
- used to make soap
- H^+
- form from a neutralization reaction
- change red litmus to blue
- sodium chloride
- found in vinegar
- taste sour
- neutralize lakes with low pH
- OH^-
- excess hydronium ions
- pH greater than 7
- slippery
- found in orange juice
- form from the reaction of a metal and a nonmetal

ACIDS



BASES

SALTS