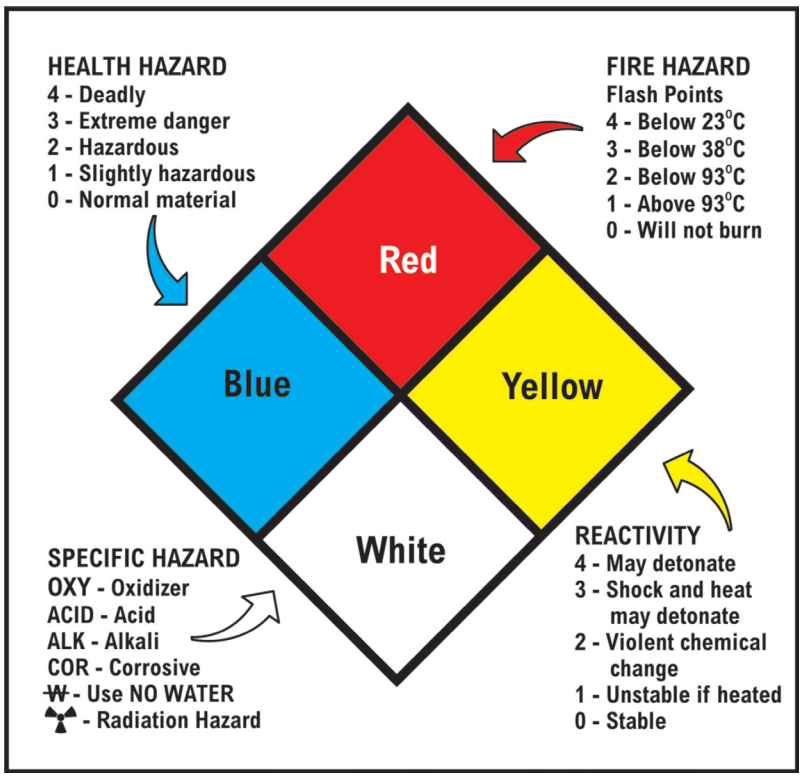
CHEMICAL MANUFACTURING ACTIVITY

Chemical Hazard Placards

Chemical hazard placards are placed on laboratories and rooms in which specific chemicals are used and stored to let safety personnel know of the dangers. They are also used on vehicles that transport chemicals. The placards have four squares—three colored squares and one open square that represent different types of hazards. The levels of the hazards are written in the squares, as defined in the placard below.



Defining Terms

Define the following words using the *Fossil Fuels to Products Glossary* or a dictionary:

Oxidizer:

Acid:

Alkali:

Corrosive:

Detonate:

Unstable:

Temperature Conversions

Convert the flash points on the Fire Hazards from Celsius to Fahrenheit using the formula: **$F = \frac{9}{5} C + 32$**

23°C =

38°C =

93°C =

© 2011 The NEED Project P.O. Box 10101, Manassas, VA 20108 1.800.875.5029 www.NEED.org

CHEMICAL MANUFACTURING ACTIVITY

Identifying Chemical Hazard Placards

Below are six chemical hazard placards and six descriptions of different chemicals. Read the chemical descriptions and match each chemical to its chemical hazard placard.

_____**CALCIUM** is a silvery, moderately hard, metallic element that constitutes about three percent of the Earth's crust and is a basic component of most animals and plants. It occurs naturally in limestone, gypsum, and fluorite, and its compounds are used to make plaster, quicklime, Portland cement, and metallurgic and electronic materials. It can be slightly hazardous to human health, and is slightly flammable. It can produce a violent reaction when it comes into contact with water.

Physical State: solid **Boiling Point:** 1,487°C **Appearance:** silver-white **Odor:** odorless

_____**METHANE**, CH_4, is an odorless, colorless, flammable gas that is the major constituent of natural gas. It is used as a fuel and is an important source of hydrogen and a wide variety of organic compounds. It is hazardous to human health and is an extreme fire hazard. It is a stable gas.

Physical State: gas **Flash Point:** -188°C **Appearance:** colorless **Odor:** odorless

_____ **BENZENE** is a colorless, very flammable, toxic, liquid, aromatic hydrocarbon, C_6H_6, derived from petroleum and used in or to manufacture a wide variety of chemical products, including solvents, detergents, insecticides, and motor fuels. It can be hazardous to human health. It is a stable compound.

Physical State: liquid **Boiling Point:** 80°C **Appearance:** colorless **Odor:** gasoline-like

_____**BUTANE** is either of two isomers of a gaseous hydrocarbon, C_4H_{10}, produced from petroleum and used as a household fuel, refrigerant, aerosol propellant, and in the manufacture of synthetic rubber. It can be slightly hazardous to human health and is an extreme fire hazard. It is a stable compound.

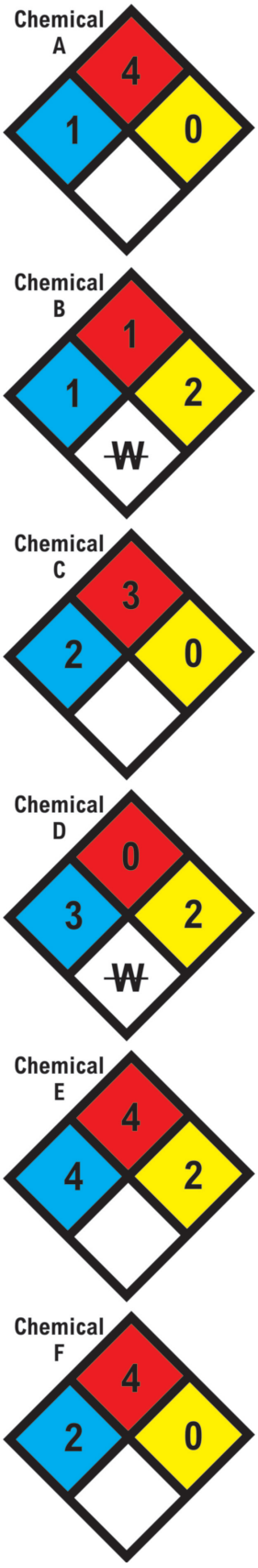
Physical State: gas **Flash Point:** -76°C **Appearance:** colorless **Odor:** faint, disagreeable

_____**SULFURIC ACID** is a highly corrosive, dense, colorless, oily liquid, H_2SO_4, used to manufacture a wide variety of chemicals and materials including fertilizers, paints, detergents, and explosives. It can pose an extreme danger to human health and is unstable, capable of causing violent chemical change. Reacts violently with water.

Physical State: liquid **Boiling Point:** 290°C **Appearance:** colorless **Odor:** sulfurous

_____**PHOSPHORUS** is a highly reactive, deadly poisonous, nonmetallic element occurring naturally in phosphates. It is used in safety matches, pyrotechnics, fertilizers, and to protect metal surfaces from corrosion. It is extremely flammable and is unstable, capable of violent chemical change.

Physical State: solid **Boiling Point:** 280°C **Appearance:** white-to-yellow **Odor:** odorless

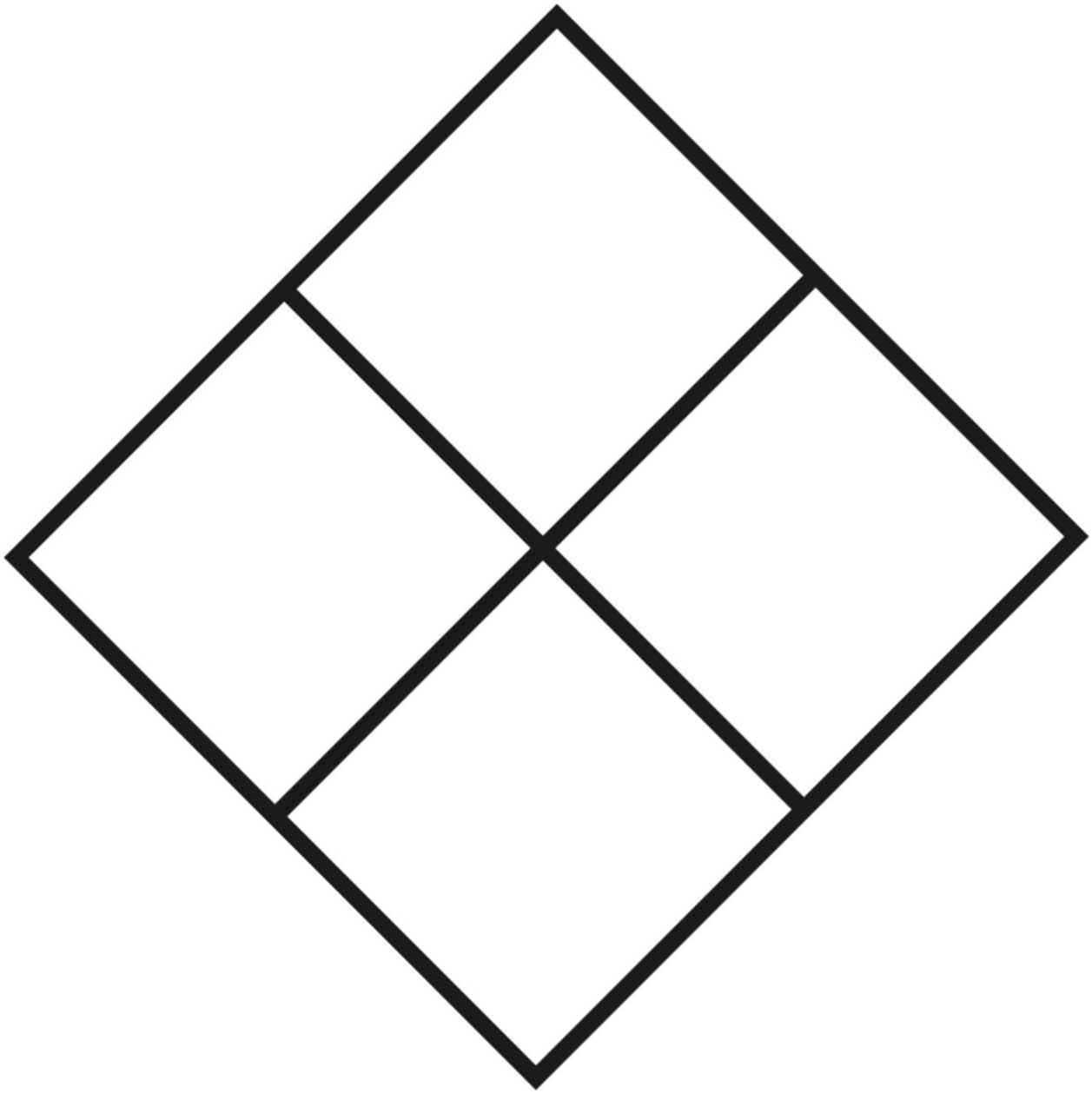


© 2011 The NEED Project P.O. Box 10101, Manassas, VA 20108 1.800.875.5029 www.NEED.org

CHEMICAL MANUFACTURING ACTIVITY

Make a Chemical Hazard Placard

Make your own chemical hazard placard. Choose a chemical you've heard about and research its characteristics and uses, then draw a placard for the chemical using the blank placard below. Display your placard and tell your classmates about the characteristics and uses of your chemical.



Chemical:

Chemical Formula:

Characteristics:

Uses:

© 2011 The NEED Project P.O. Box 10101, Manassas, VA 20108 1.800.875.5029 www.NEED.org