Name _____ Date _____ Class _____

THINGS TO KNOW

Lab and Field Safety

The study of science is challenging and fun, but it can also be dangerous. Don't take any chances! Follow the guidelines listed here, as well as safety information provided in the particular Investigation you are doing. Also, follow your teacher's instructions and don't take shortcuts—even when you think there is little or no danger.

Accidents can be avoided. The major causes of laboratory accidents are carelessness, lack of attention, and inappropriate behavior. These things reflect a person's attitude. By adopting a positive attitude and by following all safety guidelines, you can greatly reduce your chances of having an accident. Even a minor accident in a science laboratory can cause major injuries, so be very careful.

Safety Guidelines

General

Always get your teacher's permission before attempting any laboratory or field investigation. Read the procedures carefully, paying particular attention to safety information and caution statements. If you are unsure about what a safety symbol means, look it up here or ask your teacher. You cannot be too careful when it comes to safety. If an accident does occur, inform your teacher immediately, regardless of how minor you think the accident is.

Safety Equipment

Know the location of and how to use the nearest fire alarms and any other safety equipment, such as fire blankets and eyewash fountains, as identified by your teacher.

Neatness

Keep your work area free of all unnecessary books and papers. Tie back long hair, and secure loose sleeves or other loose articles of clothing, such as ties and bows. Remove dangling jewelry. Don't wear open-toed shoes or sandals in laboratory situations. Never eat, drink, or apply cosmetics in a laboratory setting; food, drink, and cosmetics can easily become contaminated with dangerous chemicals.

Cleanup

Before leaving, clean up your work area. Put away all equipment and supplies. Dispose of all chemicals and other materials as directed by your teacher. Make sure water, gas, burners, and electric hot plates are turned off. Hot plates and other electrical equipment should also be unplugged. Wash your hands with soap and water after working in a laboratory situation.

Name _____ Date _____ Class _____

THINGS TO KNOW

Lab and Field Safety *continued*

Safety Symbols

Electrical Safety

- Never handle electrical equipment with wet hands. Work areas, including floors and tables, should be dry.
- Never overload an electrical circuit.
- Make sure all electrical equipment is properly grounded.
- Keep electrical cords away from areas where someone may trip on them, or where the cords can tip over laboratory equipment.

Fire Safety

- Make sure that fire extinguishers and fire blankets are available in the laboratory.
- Tie back long hair and confine loose clothing.
- Wear safety goggles when working with flames.
- Never reach across an open flame.

Gas Precaution

- Do not inhale fumes directly. When instructed to smell a substance, wave fumes toward your nose and inhale gently.
- Use flammable liquids only in small amounts and in a well-ventilated room or under a fume hood.
- Always use a fume hood when working with toxic or flammable fumes.
- Do not breathe pure gases such as hydrogen, argon, helium, nitrogen, or high concentrations of carbon dioxide.

Glassware Safety

- Check the condition of glassware before and after using it. Inform your teacher about any broken, chipped, or cracked glassware; it should not be used.
- Air-dry glassware; do not dry by toweling. Do not use glassware that is not completely dry.
- Do not pick up broken glass with your bare hands.
- Never force glass tubing into rubber stoppers.
- Never place glassware near edges of your work surface.

Name _____ Date _____ Class _____

THINGS TO KNOW

Lab and Field Safety *continued*

Proper Waste Disposal

- Clean up the laboratory after you are finished; dispose of paper towels, etc.
- Follow your teacher's directions regarding proper procedures for waste disposal, especially for chemical disposal

Heating Safety

- Use proper procedures when lighting Bunsen burners.
- Turn off hot plates, Bunsen burners, and other open flames when not in use.
- Heat flasks or beakers on a ring stand with a wire gauze between the glass and the flame.
- Store hot liquids in heat-resistant glassware. Heat materials only in heat-resistant glassware.
- Turn off gas valves when not in use.

Chemical Safety (Poison)

- Never taste any substance in the laboratory. Do not eat or drink from laboratory glassware.
- Do not eat or drink in the laboratory.
- Properly label all bottles and test tubes containing chemicals.
- Never transfer substances with a mouth pipet; use a suction bulb.

Chemical Safety (Caustic Substances)

- Alert your teacher to any chemical spills.
- Do not let acids and bases touch your skin or clothing. If a substance gets on your skin, rinse it immediately with cool water, and alert your teacher.
- Wear your laboratory apron to protect your clothing.
- Never add water to acids; always add acids to water.
- When shaking or heating a test tube containing chemicals, always point the test tube away from yourself and other students.

Name _____ Date _____ Class _____

THINGS TO KNOW

Lab and Field Safety *continued*

Explosion Danger

- Use safety shields or screens if there is a potential danger of an explosion or implosion of apparatus.
- Never use an open flame when working with flammable liquids such as ether or alcohol.
- Follow a water-bath procedure to heat solids. Never risk an explosion by heating rocks or minerals directly.

Hand Safety (Avoiding Injury)

- Always wear gloves when cutting, fire polishing, or bending glass tubing.
- Use tongs when heating test tubes. Never hold them in your hand.
- Always allow heated materials, including glassware, to cool before handling them.

Hand Safety (Hygienic Care)

- Always wash your hands after completing an investigation.
- Keep your hands away from your face and mouth.

Clothing Protection

- Wear laboratory aprons in the laboratory.
- Confine loose clothing.

Eye Safety

- Wear approved safety goggles in the laboratory.
- Make sure an emergency eyewash station is available in the laboratory.
- Never look directly at the sun, even for short periods of time. Laboratory goggles will not protect your eyes from the sun.

Water Safety

- When working near water, always work with a partner or adult.
- Always wear a life jacket.
- Do not work near water during stormy weather.