The following safety symbols will appear in this text when you are asked to perform a procedure requiring extra precautions. Once you have familiarized yourself with these safety symbols, turn to pp. 558–561 for safety guidelines to use in all of your environmental science laboratory work.

**Safety Symbols**

**EYE PROTECTION**

- Wear safety goggles when working around chemicals, acids, bases, flames or heating devices. Contents under pressure may become projectiles and cause serious injury.
- Never look directly at the sun through any optical device or use direct sunlight to illuminate a microscope.
- Avoid wearing contact lenses in the lab.
- If any substance gets into your eyes, notify your instructor immediately and flush your eyes with running water for at least 15 minutes.

**CLOTHING PROTECTION**

- Secure loose clothing and remove dangling jewelry. Do not wear open-toed shoes or sandals in the lab.
- Wear an apron or lab coat to protect your clothing when you are working with chemicals.
- If a spill gets on your clothing, rinse it off immediately with water for at least 5 minutes while notifying your instructor.

**CAUSTIC SUBSTANCES**

- If a chemical gets on your skin, on your clothing, or in your eyes, rinse it immediately and alert your instructor.
- If a chemical is spilled on the floor or lab bench, alert your instructor, but do not clean it up yourself unless your instructor directs you to do so.

**CHEMICAL SAFETY**

- Always use caution when working with chemicals.
- Always wear appropriate protective equipment. Always wear eye goggles, gloves, and a lab apron or lab coat when you are working with any chemical or chemical solution.
- Never mix chemicals unless your instructor directs you to do so.
- Never taste, touch, or smell chemicals unless your instructor directs you to do so.
- Add an acid or base to water; never add water to an acid or base.
- Never return an unused chemical to its original container.
- Never transfer substances by sucking on a pipet or straw; use a suction bulb.
- Follow instructions for proper disposal.

**ANIMAL SAFETY**

- Always obtain permission before bringing any animal to school.
- Handle animals carefully and respectfully.
- Wash your hands thoroughly after handling any animal.

**PLANT SAFETY**

- Wear disposable polyethylene gloves when handling any wild plant.
- Do not eat any part of a plant or plant seed used in the lab.
- Wash hands thoroughly after handling any part of a plant.
- When outdoors, do not pick any wild plants unless your instructor directs you to do so.

**ELECTRICAL SAFETY**

- Do not place electrical cords in walking areas or let cords hang over a table edge in a way...
that could cause equipment to fall if the cord is accidentally pulled.

◆ Do not use equipment that has frayed electrical cords or loose plugs.
◆ Be sure that equipment is in the “off” position before you plug it in.
◆ Never use an electrical appliance around water or with wet hands or clothing.
◆ Be sure to turn off and unplug electrical equipment when you are finished using it.

🔥 HEATING SAFETY

◆ Avoid wearing hair spray or hair gel on lab days.
◆ Whenever possible, use an electric hot plate instead of an open flame as a heat source.
◆ When heating materials in a test tube, always angle the test tube away from yourself and others.
◆ Glass containers used for heating should be made of heat-resistant glass.

⚠️ SHARP OBJECTS

◆ Use knives and other sharp instruments with extreme care.
◆ Never cut objects while holding them in your hands. Place objects on a suitable work surface for cutting.
◆ Never use a double-edged razor in the lab.

 $$$ HAND SAFETY $$$

◆ To avoid burns, wear heat-resistant gloves whenever instructed to do so.
◆ Always wear protective gloves when working with an open flame, chemicals, solutions, or wild or unknown plants.
◆ If you do not know whether an object is hot, do not touch it.
◆ Use tongs when heating test tubes. Never hold a test tube in your hand to heat the test tube.

🔥 FIRE SAFETY

◆ Know the location of laboratory fire extinguishers and fire-safety blankets.
◆ Know your school’s fire-evacuation routes.

🔥 GAS SAFETY

◆ Do not inhale any gas or vapor unless your instructor directs you to do so. Do not breathe pure gases.
◆ Handle materials prone to emit vapors or gases in a well-ventilated area. This work should be done in an approved chemical fume hood.

🔥 GLASSWARE SAFETY

◆ Check the condition of glassware before and after using it. Inform your teacher of any broken, chipped, or cracked glassware, because it should not be used.
◆ Do not pick up broken glass with your bare hands. Place broken glass in a specially designated disposal container.

🔥 WASTE DISPOSAL

◆ Clean and decontaminate all work surfaces and personal protective equipment as directed by your instructor.
◆ Dispose of all broken glass, contaminated sharp objects, and other contaminated materials (biological and chemical) in special containers as directed by your instructor.

🔥 HYGIENIC CARE/CLEAN HANDS

◆ Keep your hands away from your face and mouth.
◆ Always wash your hands thoroughly when you have finished with an experiment.