

Essential Biology

Student Investigations

LOG IN TO YOUR TEACHER ACCOUNT
TO ACCESS THE COMPLETE MANUAL

PASCO[®]

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LABORATORY SAFETY PROCEDURES

PASCO is concerned with your safety and because of that, we are providing a few guidelines and precautions to use when exploring the investigations in Essential Biology. This is a list of general guidelines only; it is by no means all-inclusive or exhaustive. Be responsible for your behavior. Common sense and standard laboratory safety practices should be followed in every investigation.

General Lab Safety Procedures and Precautions

- Follow all standard laboratory procedures.
- Absolutely no food or drink or chewing gum is allowed in the lab.
- Keep water away from electrical outlets.
- Make sure the cord on electronic equipment is not frayed and does not show exposed wires before plugging in.
- Remember to wear protective equipment (e.g., safety glasses, gloves, apron) when appropriate.
- Do not touch your face with gloved hands. If you need to sneeze or scratch, take off your gloves, wash your hands, and then take care of the situation. Do not leave the lab with gloves on.
- Wash your hands after handling samples, glassware, and equipment.
- Know the safety features of your lab such as eye-wash stations, fire extinguisher, first-aid equipment or emergency phone use.
- Insure that loose hair and clothing is secure when in the lab.
- Handle glassware with care. Check all glassware for chips and cracks before using.
- Insure you have adequate clear space around your lab equipment before starting an activity.
- Do not wear open toe shoes or short pants in the laboratory.
- Allow heated objects and liquids to return to room temperature before moving them.
- Never run or joke around in the laboratory.
- Do not perform unauthorized experiments.
- Students should use a buddy system in case of trouble.
- Keep the work area neat and free from any unnecessary objects.

Water Related Safety Precautions and Procedures

- Keep water away from electrical outlets.
- Keep water away from all electronic equipment.

Outdoor Safety Precautions

- Practice appropriate caution around water bodies, steep terrain, and harmful plants or animals.
- Treat plants, animals and the environment with respect.
- Inspect all equipment for damage (cracks, defects, etc.).
- Know your teacher's procedure for emergencies and use the buddy system in case of trouble.
- Always follow your teacher's instructions when collecting samples in the field.

Chemical Related Safety Precautions and Procedures

- Consult the manufacturer's Material Safety Data Sheets (MSDS) for instructions on handling, storage, and disposing of chemicals. Your teacher should provide the MSDS sheets of the chemicals that you are using. Keep these instructions available in case of accidents.
- Many chemicals are hazardous to the environment and should not be disposed of down the drain. Always follow your teacher's instructions for disposing of chemicals.
- Sodium hydroxide, hydrochloric acid, and acetic acid are corrosive irritants. Avoid contact with your eyes and wash your hands after handling. In case of skin exposure, rinse with plenty of water.
- Always add acids and bases to water, not the other way around, as the solutions may boil vigorously.
- Diluting acids and bases creates heat; be extra careful when handling freshly prepared solutions and glassware, as they may be very hot.
- Handle concentrated acids and bases in a fume hood; the fumes are caustic and toxic.
- Wear eye protection, lab apron, and protective gloves when handling acids. Splash-proof goggles are recommended. Either latex or nitrile gloves are suitable. Use nitrile gloves if you have latex allergy.
- Read labels on all chemicals and pay particular attention to hazard icons and safety warnings.
- When handling any bacterial species, follow aseptic techniques.
- Wash your hands before and after a laboratory session.
- If any solution comes in contact with skin or eyes, rinse immediately with a copious amount of running water for a minimum of 15 minutes.
- Follow the teacher's instructions for disposing of chemicals.
- Always check the label on a container to verify you are using the correct substance before taking any of it.
- Never point the open end of a test tube containing a substance at yourself or others.
- Use a wafting motion when smelling chemicals.
- Do not return unused chemicals to their original container.
- Keep flammable chemicals away from an open flame.

Dangerous or Harmful Substance Related Lab Safety Precautions

- When handling any bacterial species, follow aseptic techniques.
- Always flame inoculating loops and spreaders before setting them down on the lab bench.
- Pipetting suspension cultures can create an aerosol. Keep your nose and mouth away from the tip of the pipet to avoid inhaling any aerosol.
- Use caution when working with acids and bases.
- Use appropriate caution with matches, open flames, burning objects such as splints and foods, and other hot materials.
- Be careful using a knife or scalpel. Cut on a flat surface in a direction away from your body.

Other Safety Precautions

- If water is boiled for an experiment involving heat, make sure it is never left unattended. Remember, too, that the hot plate will stay hot well after it is unplugged or turned off. Hot glassware looks the same as cool glassware so test glass temperature before handling an item that may be hot.
- Any injury must be reported immediately to the instructor, an accident report has to be completed by the student or a witness.
- If you are suffering from any allergy, illness, or are taking any medication, you must inform the instructor. This information could be very important in an emergency.
- Try to avoid wearing contact lenses. If a solution spills in your eye, the presence of a contact lens makes first aid difficult and can result in permanent damage. Also, organic solvents tend to dissolve in soft contact lenses, causing eye irritation.

Additional Safety Resources

- Flinn Scientific
- The Laboratory Safety Institute (LSI)
- National Science Education Leadership Association (NSELA)/Safe Science Series

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