

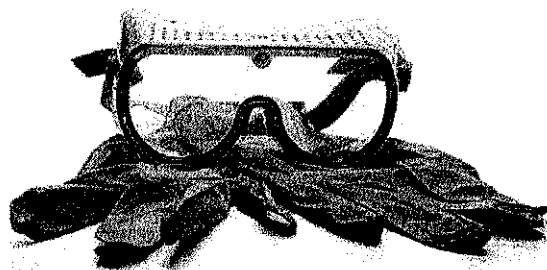
Mark and his classmates are getting ready to conduct an investigation in their science class. Curious about the chemicals they are about to use, Mark leans over a beaker to take a closer look. His eyes are only inches away from the chemicals, and his hair dangles close to the mouth of the beaker. One of Mark's classmates notices his behavior and quickly urges Mark to step away from the beaker.

Following common safety practices is the first rule of any laboratory or field scientific investigation. In the example described above, Mark was not practicing safe behavior. What should he have done differently? Read about the many ways you can safely prepare for and carry out a scientific investigation.

Dress for Safety

One of the most important steps in a safe investigation is dressing appropriately. If an investigation involves chemicals, liquids, glass, or the use of heat, wear chemical splash goggles, snug over your eyes to protect your eyes from damage. Keep the goggles on to protect your eyes for the entire investigation. If other groups are still working with chemicals, glass, or heat after you have finished, keep your goggles on. Use gloves to protect your hands when handling chemicals or organisms. Tie back long hair to prevent it from coming in contact with chemicals or a heat source. Be sure to roll up long sleeves. If they are available, wear a lab coat or apron over your clothes. Always wear close-toed shoes.

During field investigations, wear long pants and long sleeves to protect against insect bites and poisonous plants. Use sunscreen along with a hat and clothes that reduce sun exposure. Wear sturdy, close-toed shoes. If you are working with liquids, such as pond water, wear chemical splash goggles to protect your eyes. If you are handling plants that you do not recognize, use gloves to protect your hands.



Follow the dress code in a laboratory setting, including wearing chemical splash goggles and gloves.

Be Prepared for Accidents

Even if you are practicing safe behavior during an investigation, accidents can happen. To help you prepare for a potential accident, learn where the emergency equipment is in your classroom and how to use it.

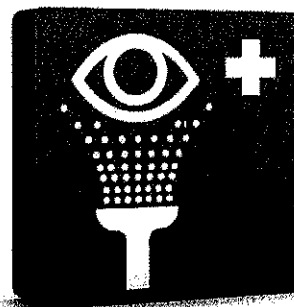
The eye and face wash station can help if a harmful substance or foreign object gets into your eyes or onto your face. This device flushes your eyes and face with a safe liquid, such as water or saline. The eye and face wash station can reduce the harmful effects of a chemical or foreign object. Read the instructions on the eye and face wash in your classroom so that you are prepared to use it if you need it.

Fire blankets and fire extinguishers can be used to smother and put out fires in the laboratory. To use a fire extinguisher, pull the pin at the top, aim the extinguisher's nozzle at the base of the fire, and squeeze the metal handles of the trigger. Fire extinguishers containing water should only be used to extinguish fires containing paper, wood, or cloth. Fire extinguishers containing carbon dioxide, foam, or a multi-purpose dry chemical mixture can be used to extinguish fires caused by flammable liquids or electricity. A fire blanket is used to smother small fires. It is also used to extinguish a fire on a person. The thick blanket deprives the fire of oxygen, which causes the fire to go out. Talk to your teacher about fire safety in the lab. He or she may not want you to directly handle the fire blanket and fire extinguisher. However, you should still know where these items are in case the teacher asks you to retrieve them. Be sure to know the exit closest to your workstation in case you need to evacuate the classroom.

Most importantly, when an accident occurs, immediately alert your teacher and classmates. Do not try to keep the accident a secret or respond to it by yourself. Your teacher and classmates can help you.

Practice Safe Behavior

There are many ways to stay safe during a scientific investigation. As described above, always dress appropriately for an investigation whether laboratory or field. Prepare for



The eye and face wash station in your classroom may be marked with a symbol like this one.

accidents by learning how to use the emergency equipment in the classroom. In addition, you should always use safe and appropriate behavior before, during, and after your investigation.

Read the all of the steps of the procedure before beginning your investigation. Make sure you understand all the steps. Ask your teacher for help if you do not understand any part of the procedure. Gather all your materials and keep your workstation neat and organized. Label any chemicals you are using. Always work with a partner or a group. You should never work alone in a laboratory or field investigation.

During the investigation, be sure to follow the steps of the procedure exactly. Use only directions and materials that have been approved by your teacher. Eating and drinking are not allowed during an investigation. Some harmful chemicals look just like water – you would not want to ingest them accidentally. If asked to observe the odor of a substance, do so using the correct procedure known as wafting, in which you cup your hand over the container holding the substance and gently wave enough air toward your face to make sense of the smell. When performing investigations, stay focused on the steps of the procedure and your behavior during the investigation. During investigations, there are many materials and equipment that can cause injuries.

If you are conducting a field investigation, stay with a classmate at all times and do not wander off. Always be aware of the location of the teacher and other classmates. Make sure that if you needed help, the teacher or a classmate could hear you. Be sure to stay on safe, marked paths as much as possible to avoid injuries or poisonous plants and animals. Do not handle anything you do not recognize.



Cooperate with your teacher and classmates to conduct safe scientific investigations.

Treat animals and plants with respect during an investigation. Be careful handling animals when removing them from and returning them to their habitat. Be sure to handle them carefully and without unnecessary stress. Provide enough food and water, and keep them comfortable while completing your observations. If you do not need to collect a plant for the investigation, then leave it where it is growing.

After the investigation is over, appropriately dispose of any chemicals or other materials that you have used. Ask your teacher if you are unsure of how to dispose of anything. Make sure that you have returned any extra materials and pieces of equipment to the correct storage space. Leave your workstation clean and neat. Wash your hands thoroughly.

Check for Understanding:

1. What are two ways to safely dress for an investigation?
2. When should you use chemical splash goggles? Why are they important?
3. Describe what to do if chemicals or foreign objects get into your eyes or face.
4. Explain three ways to stay safe during field investigations.
5. Mark was not following common safety practices. Describe three ways he could increase his safety during his investigation.