



STEM (Science, Technology, Engineering, and Math): Safety Activity Checkpoints



Women have made incredible contributions to the STEM community and have, as a result, advanced culture and improved modern ways of life. Unfortunately, women are underrepresented in these fields, especially technology and engineering. A number of organizations work to encourage girls to enter the sciences and to connect girls with mentorship and education in the sciences (see the “STEM Links” section for resources). To encourage girls’ interest in STEM, it’s important to engage them in hands-on activities that provide ties to real-world applications. Activities should allow girls to explore the vast array of career opportunities available to them. Before working with girls, make sure you fully understand the STEM activity and make note of any additional safety precautions provided in the activity directions.

Include girls with disabilities. Communicate with girls with disabilities and/or their caregivers to assess any needs and accommodations. Learn more about the resources and information that [Foundation for Science and Disability](#) provides to people with disabilities. [Do It](#) provides resources for teachers to make STEM activities accessible to girls with disabilities.

Prepare for the STEM Activity

- Communicate with council and parents.** See the *Introduction to Safety Activity Checkpoints*.
- Girls plan the activity.** See the *Introduction to Safety Activity Checkpoints*.
- Arrange for transportation and adult supervision.** See the *Introduction to Safety Activity Checkpoints for the recommended adult-to-girl ratios*.
- Prepare for informative learning experiences.** Research STEM activity and encourage girls to take active roles in preparing educational and safety aspects. If using chemicals, prior to the activity, adults

and instructors should be familiar with safety procedures and possible side effects of contact with the chemical as listed on the chemicals' corresponding [Material Safety Data Sheet](#).

- ❑ **Select a safe location***. Inspect the site to be sure:
 - It is free of potential hazards
 - Contains well-ventilated areas when using vaporous materials such as chemicals.
 - Flammable materials are kept in fireproof containers and in an area away from ignition sources.
 - Food or beverages are not consumed in an activity area, and hands are washed before eating.
- ❑ **Ensure safety of equipment and materials***. The work area should be ample and appropriate for the science activity. When working with any chemical, plant, or animal, the following are observed:
 - Hands do not touch the mouth or face during the activity.
 - Facilities for washing hands and eyes are available at the site.
 - Hands are washed thoroughly after the activity.
 - Equipment is thoroughly cleaned.
 - Used materials are disposed of properly.
 - Chemical substances are used or mixed only when the adult in charge specifically knows the outcome.
 - When chemicals are used, goggles stamped ANSI Z87 on the frame and lens must be worn. Even the simplest experiment can be an eye hazard.
- ❑ **Ensure use of gloves when necessary**. Non-latex gloves made of nitrile or neoprene are worn when working with chemicals and unknown plants and substances. Vinyl gloves generally do not provide appropriate protection. The [American Chemical Society](#) provides additional information about chemical safety.
- ❑ **Compile key contacts**. See *the Introduction to Safety Activity Checkpoints*.
- ❑ **Dress appropriately for the activity**. Make sure girls and adults avoid wearing dangling earrings, bracelets, and necklaces that may become entangled in equipment.
- ❑ **Be prepared in the case of an emergency**. Ensure the presence of a waterproof first-aid kit and a first-aider with a current certificate in First Aid, including Adult and Child CPR or CPR/AED, who is prepared to handle burns. Emergency procedures are clearly posted for swallowing a chemical, getting a chemical in the eyes, skin contact with a chemical, and so on. See *Volunteer Essentials* for information about first-aid standards and training.

On the Day of the STEM Activity

- ❑ **Get a weather report**. If the activity is outdoors, on the morning of the science activity, check [weather.com](#) or other reliable weather sources to determine if conditions are appropriate, and make sure that the ground is free of ice. If severe weather conditions prevent the activity, be prepared with a backup plan or alternate activity, or postpone the activity. Write, review, and practice evacuation and emergency plans for severe weather with girls. In the event of a storm, take shelter away from tall objects (including trees, buildings, and electrical poles). Find the lowest point in an open flat area. Squat low to the ground on the balls of the feet, and place hands on knees with head between them.
- ❑ **Use the buddy system**. See the Introduction to Safety Activity Checkpoints.
- ❑ **Communicate with girls about STEM safety**. Before beginning a STEM activity, talk with girls about safety and point out potential dangers and appropriate safety precautions to take.
- ❑ **Take care with animals***. Whenever animals or objects they use—such as food bowls, water dishes, or toys—are handled, hands must be thoroughly washed with soap under running water. Iguanas, turtles and other reptiles, as well as pet ducklings and chicks, can harbor salmonella bacteria, which can be passed on to humans. Contact with these animals should be avoided. Activities with animals are carried out with sensitivity and concern for the needs of the animals. Aquariums and terrariums are kept in areas where proper care, temperature regulation and maintenance are always possible. Girls are aware of the proper care, feeding, and maintenance of animals and take responsibility for meeting these needs.

STEM Links

- FIRST (For Inspiration and Recognition of Science and Technology): [www.usfirst.org](#)

- NASA: www.nasa.gov
- Society of Women Engineers: <http://societyofwomenengineers.swe.org/>
- Women in Science: www.womeninscience.org

STEM Know-How for Girls

- **Learn about careers in the sciences.** Aerospace engineer, meteorologist, cryptographer—these are just some of the jobs in science, technology, engineering, and technology. Learn more about additional career options at [Engineer Your Life](#).
- **Pick cool STEM projects.** What do you want to learn about in science, technology, engineering, and math? Visit Girl Scout partner site pbskids.org to watch shows such as *Curious George*, *FETCH!*, *Design Squad*, *Cyberchase*, and *SciGirls*.

***These checkpoints must be reviewed with the vendor and/or facility, when appropriate.**