

## 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. However, women are still underrepresented in these fields, especially technology and engineering.

### Encourage girls' interest in STEM:

Engage them in hands-on activities that tie to the real world and help others. Invite STEM professionals to talk to girls about their careers. Organize field trips to science museums, technology centers and local STEM businesses.

(Check out the STEM Links section below for resources.)

### Stay safe:

Before facilitating a STEM activity with girls, make sure you fully understand the activity and all safety precautions provided in the 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.** Keeping their grade-level abilities in mind, encourage girls to take proactive leadership roles in organizing details of the activity.
- 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 anything that could become entangled with equipment: dangling earrings, bracelets, necklaces, scarves, etc. For the same reason, have girls and adults tie back long hair. Wear closed-toe shoes and long pants to add protection from breaking glass or chemical spills.
- **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.** See the Introduction to Safety Activity Checkpoints. **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.
- **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. Carry out all activities with animals, using sensitivity and concern for the animals' needs. Keep

aquariums and terrariums in areas where proper care, temperature regulation and maintenance are always possible. Make sure girls know the proper care, feeding, and maintenance of animals and take responsibility for meeting those needs.

## STEM Links

### COMPUTER SCIENCE

- Anita Borg Institute: <http://anitaborg.org/>
- Black Girls Code: <http://www.blackgirlscode.com/>
- Code.org: <https://code.org/>
- Girls Who Code: <https://girlswhocode.com/>
- National Center for Women and Information Technology: <https://www.ncwit.org/>

### ENGINEERING

- DiscoverE: <http://www.discovere.org/our-programs/girl-day>
- Engineer Your Life: <http://www.engineeryourlife.org/>
- FIRST (For Inspiration and Recognition of Science and Technology): [www.usfirst.org](http://www.usfirst.org)
- National Engineers Week: <https://www.nspe.org/resources/partners-and-state-societies/national-engineers-week>
- Society of Women Engineers: <http://societyofwomenengineers.swe.org/>
- Techbridge: <http://www.techbridgegirls.org/>

### MAKING

- Fab Foundation: <http://www.fabfoundation.org/>
- Maker Education: <http://makered.org/>

### SCIENCE MUSEUMS AND TECHNOLOGY CENTERS

- [Association of Science-Technology Centers: http://www.astc.org/](http://www.astc.org/)

### SPACE SCIENCE

- Astronomical Society of the Pacific: <https://www.astrosociety.org/education/amateur-astronomy/>
- NASA: [www.nasa.gov](http://www.nasa.gov)
- SETI Institute: <https://www.astrosociety.org/education/amateur-astronomy/>
- Women@NASA: <http://women.nasa.gov/>

### STEM PROJECTS

- PBS KIDS: <http://www.pbs.org/parents/fetch/activities/activityguides.html>
- Scistarter: <https://scistarter.com/>

### WOMEN IN STEM

- Association for Women in Science: [www.awis.org](http://www.awis.org)
- [National Girls Collaborative Project: https://ngcproject.org/](https://ngcproject.org/)

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