SIEMENS STEM DAY | Science Technology Engineering Math

ABOUT THE PROGRAM

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The Siemens Foundation's mission is inspired by the culture of innovation, research and continuous learning that is the hallmark of Siemens' companies. Together, the programs at the Siemens Foundation are closing the opportunity gap for young people in the U.S. when it comes to STEM careers and igniting and sustaining today's STEM workforce and tomorrow's scientists and engineers.

Siemens STEM Day offers a variety of tools and resources that help reinvent STEM curriculum, including new, original hands-on activities and a support center.

QUICK FACTS

Program Name
Siemens STEM Day

URL
www.siemensstemday.com

Audience:
Grades K–12

PROGRAM COMPONENTS

Below is a list of resources currently available on www.siemensstemday.com. Parents, educators, and students, as well as afterschool professionals and STEM community organizers will find over 150 easily-sortable activities for use in after-school programs to make it easy and fun for you to connect with kids about STEM.

CLASSROOM ACTIVITIES

Siemens STEM Day features over 150 single-session activities highlighting the areas of science, technology, engineering, and math that are designed to inspire students to think critically about the career paths of healthcare, manufacturing, energy, and information technology. These resources were created to support you as you lead students in exploring the role STEM plays in these fields. The "one and done" nature of these resources makes them ideal for use in after-school or community settings.

CAREER PROFILES

There are many pathways to a successful career in STEM and more and more opportunities are being created each day with the advancement of new technology. Siemens STEM Day features four STEM professionals speaking about what their job looks like and what kind of training and education they needed to achieve their goals. Each video only takes 3 minutes or less to watch, but provides inspiring insight into the lives of Siemens employees.

TRAINING GUIDE

This guide outlines how to incorporate the Siemens STEM Day activities into your work with students in or out of the classroom. You'll see how easy it is to make STEM accessible and engaging with the Siemens STEM Day resources and see that you don't need to be a STEM expert to go through the activities.

TRAINING VIDEO

Take a deep-dive into the Siemens STEM Day program and the mission behind it with our kick-off training video. This video will provide insight into the incredible resources offered through the STEM Day website and will demonstrate the effective use of these assets in teaching concepts and leading hands-on student activities in any type of educational setting.

FIVE-MINUTE REFRESHERS

Maybe it's been a while since you learned about STEM concepts yourself! Not to worry, Siemens STEM Day offers 20+ refreshers on various STEM topics designed to help you prepare for your Siemens STEM Day hands-on activities by providing introductory information about STEM topics.

The Siemens STEM Day program aims to make STEM accessible to *all* students in diverse school and community-based settings. This guide will help prepare you to work with students in small and large-group settings. It provides tips and suggestions to engage, explain, discuss, and effectively facilitate exciting learning opportunities using resources from www.siemensstemday.com.

Each activity was designed to be straightforwardly implemented by educators, parents, after school professionals, or STEM community organizers and simply followed by students. No specialized equipment is required, and most materials are easily obtainable, making these activities as accessible as possible.

Listed below are resources currently available for the STEM Day program.

CLASSROOM ACTIVITIES (45–60 MINUTES)

Divided into three age groups (grades K–5, grades 6–8, and grades 9–12), each activity has an expected duration of 45-60 minutes. Each activity includes an overview, student learning objectives, materials, essential questions, procedure, national learning standards, and handouts. Each Siemens STEM Day classroom activity highlights one or more components of the engineering design cycle and an essential 21st-century skill.

Engineering Design Cycle	21st Century Skills
• Defining the Problem • Designing Solutions • Creating or Prototyping • Refine or Improve • Communicating Results	• Collaboration • Communication • Critical Thinking • Creativity

TIPS

- Technology: It is important to consider the technology available at your site before choosing which activity to implement with the students. There are a variety of activities available at each grade level that do not require student interaction with technology. It is also possible in some cases to prepare some resources ahead of time to supplement lack of technology.
- Time and Preparation: We know that time can be a barrier to STEM instruction so each activity only takes about 45 minutes to implement from start to finish. All Siemens STEM Day activities were designed to be "plug and play" meaning they do not require major set up of equipment or lengthy preparation on behalf of the organizer. A preliminary read-through of the instructions is all it takes to know exactly how to lead the activity with students.
- Finding the Right Activity: With over 150 activities, it may seem daunting to find the right one for your purpose. However, it's easy to navigate to the exact activities that are right for you and the student group you're working with using the filters on Siemens STEM Day. You can filter by the following categories:
  - STEM topic (science, technology, engineering, math)
  - Career path (healthcare, IT, energy, manufacturing)
  - Grade level (K–5, 6–8, 9–12)
  - Difficulty Level: Each activity is assigned a difficulty level from 1–4, with those in group 1 being the easiest activities and those in group 4 being more advanced.
  - Most popular: This program is widely used by educators nationwide—see which activities are their tried and true favorites!

INTRODUCING THE ACTIVITY

Tell them about any experience you have with STEM or the activity topic, what your interests were at their age, and how that translated into the career you have today. Explain to them what you will be learning together and be sure to keep things brief, friendly, and relatable.

Students are going to be very interested and curious with having a special guest and will likely have a lot of questions! Work with the school to determine the best method for inviting students to ask questions before, during, and throughout the activity.

Making Connections

When previewing the activity materials, note opportunities to share real-life stories that make connections to the topics. Practice pacing sections of the activity and make note of areas to pause for questions, engage with a personal story, or point out parts of a visual.

CONSIDER THE STUDENTS' PERSPECTIVE

The students you are working with are intellectual, social, and emotional learners. They are very curious and enjoy interacting with peers during learning activities. They like to be active learners and are still experimenting with ways of talking and acting as they learn and grow.

It is important to remember that the students you are working with may be located in underrepresented areas and arrive along the socio-economic spectrum. Remain cognizant of and sensitive to issues of income inequality, resource inequality, technological disadvantage, food scarcity, etc. Engaging students in hands-on learning and maintaining focus on high-interest STEM topics can help create a positive learning space.

ORGANIZING TEAMS FOR EFFECTIVE GROUP WORK

An after-school environment may include a handful of students or up to 40! Sometimes students will be seated in small groups and others will be in rows or scattered around the room. Large groups can be challenging to effectively assess if students are engaged or understanding the information presented. It is also difficult to build relationships and visit with students individually in the short amount of time. It is always helpful to organize students into smaller groups whenever possible. Walking around the space and making eye contact with different students can also help personalize the space. As students enter the room, or as you enter, say hello and introduce yourself.

MAKE IT A SERIES

As discussed above, there are many activities to choose from on Siemens STEM Day that cover each of the S-T-E-M topics and vary in difficulty. For afterschool or community programs that meet regularly, consider bundling a few STEM Day resources to make a mini curriculum. You could incorporate one activity from each of the categories (science, technology, engineering, and math) in the appropriate grade band, or you could build a series based on difficulty, starting with a Level 1 activity and moving on through Level 4. Here are two examples to get you started:

Exploring STEM for Grade 4

1. Science: Tornado in a Bottle
2. Technology: Get Cooking
3. Engineering: Hang Time
4. Math: Hole in One

Leveling Up in STEM for Grade 4

Level 1: Build This Structure

Level 2: Bottle Music

Level 3: Color Wheel

Level 4: Let's Hear it for the Ears!

And lastly, have fun! This is a great opportunity for you to reach and inspire students in your community and beyond. We hope you find it rewarding, and we thank you for your time and interest in being a vital part of this program.