

Staff Training

The following training is designed to help program leaders introduce staff to ClubZOOM and train staff on how to lead engineering activities. The training has three parts that you can customize to fit your program.

Training Overview

Part 1 ZOOM 101 (10–30 minutes)
Introduce your staff to ZOOM.

Part 2 Leading a ClubZOOM Activity (20–40 minutes)
Introduce your staff to engineering and lead them through the Super Golf Tower activity. They'll get a chance to experience the engineering design process, and you can model how to lead hands-on activities.

Part 3 Planning ClubZOOM (15–20 minutes)
Familiarize staff with how a typical ClubZOOM meeting works and start planning your club.



Part 1: ZOOM 101

Begin by introducing your staff to ZOOM. Since they may not be daily viewers, here are some ways your staff can get to know ZOOM and ClubZOOM Engineering.

Read the “ZOOM 101” handout

Photocopy and distribute the handout on the next page to provide a general overview of ZOOM and ClubZOOM Engineering.

Watch ZOOM

Check your local TV listings to find out when ZOOM is on your PBS station. Then tape any 30-minute episode, order some food, and host a ZOOM screening. Or, ask your leaders to watch a ZOOM episode at home.



Surf the ZOOM Web site (pbskids.org/zoom)

ZOOM's Web site is a place where kids can find directions for the engineering and science activities they see on the show and send in their own ideas and results. The site also hosts a section called ZOOMtoo that's geared especially to afterschool providers, educators, and parents. See the “Visit the ZOOM Web Site” handout for a quick overview of key sections to visit on the Web site.





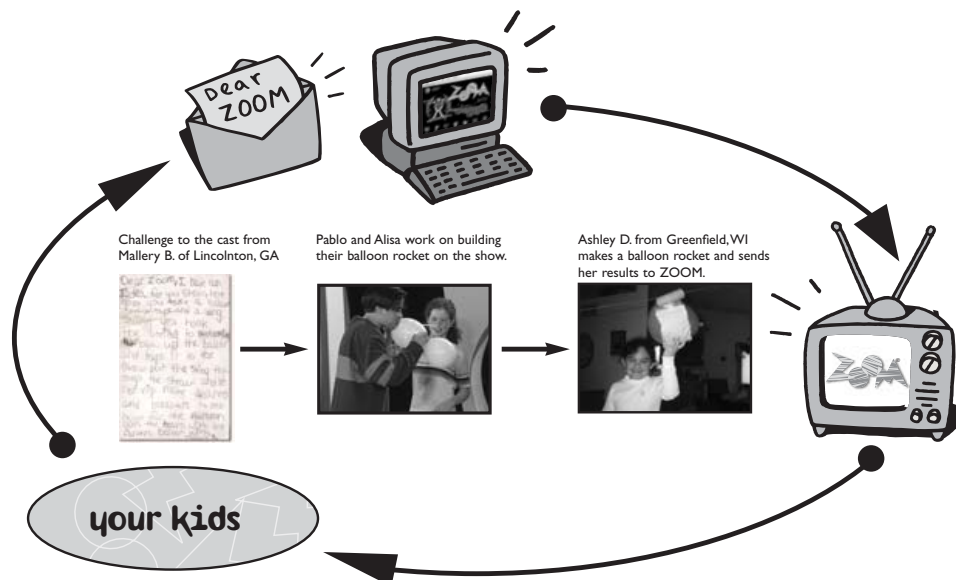
What Is ZOOM™?

ZOOM is a daily PBS television show, Web site, and educational outreach campaign that motivates kids to explore, experiment, and share their creativity. Targeted at kids ages six to twelve, ZOOM features a diverse cast of seven kids who bring to life activities sent in by viewers from across the country. Activities range from science and engineering explorations to games, recipes, and arts and crafts. You can watch ZOOM on your PBS station (check local TV listings for times) and visit the Web site at pbskids.org/zoom.



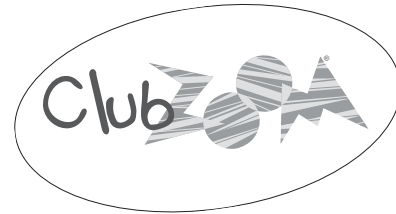
How Do Kids Interact with ZOOM?

“Send it to ZOOM™!” is ZOOM’s call to action. Kids learn about ZOOM activities from the TV show, Web site, and places like afterschool programs and museums. Then kids try the activities and send their results and new ideas back to ZOOM, where these ideas can become content for the Web site and new ZOOM shows. Every day we receive thousands of letters and e-mails from kids across the country. We want to hear from your kids, too!



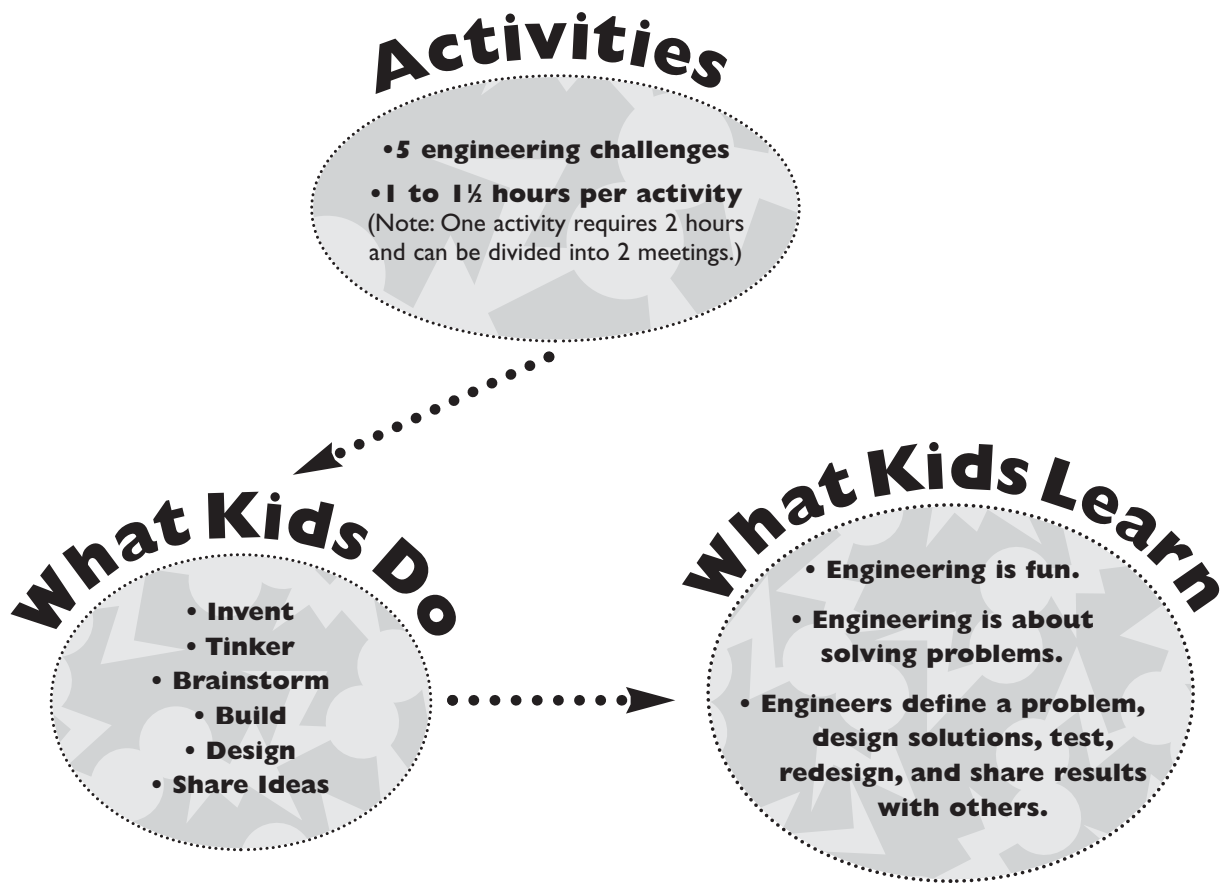
What Is ClubZOOM Engineering?

ClubZOOM is built around five ZOOM engineering activities that inspire kids to invent, design, build, brainstorm, and work together to solve different problems. ClubZOOM provides an ideal setting for kids ages eight to twelve to have fun while discovering the exciting world of engineering.



What's My Role?

You make it happen! As a ClubZOOM leader you play a key role in helping kids think like engineers. Don't worry—you don't need to be an expert and know all of the answers. Instead you can learn along with your kids. Engineering is all about solving problems. As you work together, you can encourage kids to ask questions, use their imaginations, try again when something fails, and share their ideas. The main goal behind every ClubZOOM activity is to help kids develop the confidence to say, "I can do it!"



Visit the ZOOM™ Web site pbskids.org/zoom

**ZOOM's
Web site will have
a fresh new look
Spring 2004.**



ZOOM Home Page
Every day an average of 35,000 kids visit the ZOOM Web site.



ZOOMsci™
Find directions for more than 100 engineering, science, and math activities.



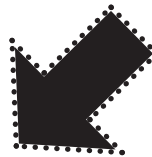
Send It to ZOOM
Tell kids they can use these forms to send their activity results and ideas to ZOOM.



Site Map
Search the site map to learn about dozens of other ZOOM features.



Parents & Educators
Visit this special section for afterschool providers, teachers, and parents that contains tips for leading activities and printable activity sheets.



Printable Activity Pages

Many ZOOM activities are available as printable handouts, with some translated into Spanish. There are also activity charts that provide a quick overview of each activity, sample questions to ask kids, and related activities.



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Part 2: Leading a ClubZOOM Activity

Introduce your staff to engineering by having them try the Super Golf Tower activity. They'll get a chance to experience the engineering design process, and you'll get to model how to lead hands-on activities.

I **Talk about engineering.**

Before you dive into the activity, talk with your staff about engineering and what engineers do. Here are some ideas.

What do you think of when you hear the word “engineering”?

Ask people to share what they know about engineers and the products they design. Do they know people who are engineers? Note any stereotypes that might come up (such as “engineers are nerds” or “engineering is only for men”). You can use the “Meet an Engineer” and “Engineering the Future” bulletin board postings in each activity section for examples of engineers and some of the interesting products they design. See also the Engineering Careers on page 128 for a list of different branches of engineering.

How can we introduce engineering to kids?

Kids may or may not know what engineers do. (It's not unusual for kids to think an engineer is someone who drives a train!) In a nutshell, engineers solve problems using science and technology. Discuss how to get kids excited about engineering and to help them focus on problem solving. Good words to describe what engineers do include: invent, build, test, draw, design, tinker, problem-solve, imagine, brainstorm, and share ideas. Kids (and leaders) already have lots of experience doing these same things.

How can kids benefit from an engineering club?

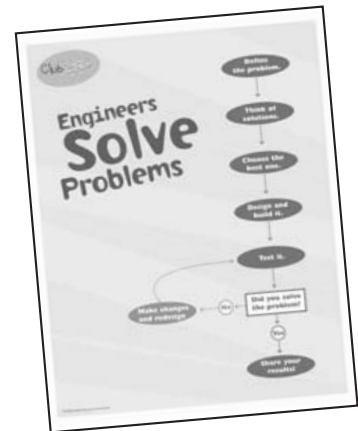
There’s no question—it’s just plain fun to build things and solve problems. Plus, engineering activities offer ways for kids to practice many of the science and math skills they are learning in school by applying them to hands-on challenges. Brainstorm other reasons why engineering fits into your program. Are there connections to other activities you’re already doing? Have kids expressed an interest? Are you looking for ways to introduce kids to new careers? Do you have resources that would support an engineering club, such as a partnership with your science museum or volunteers who have engineering skills?

Define the engineering design process.

No matter what problem is being solved, engineers tend to go through a series of steps as they design solutions. It’s called the *design process* and includes these steps:

- **Define the problem**
- **Think of solutions and choose the best one**
- **Design and build**
- **Test**
- **Redesign**
- **Share results**

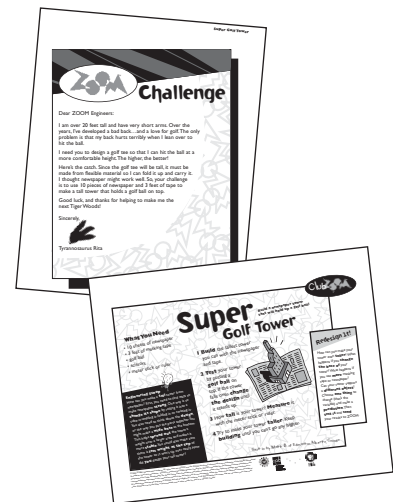
You can show your staff the “Engineers Solve Problems” sign (see Appendix) as you talk about the steps. Point out that kids will experience the same process as they do ClubZOOM activities. Also note that while engineers go through these steps as they design, they may not always follow this order.



2 Build a Super Golf Tower

Since the best way to understand engineering is by doing it, have your staff design and build newspaper towers using the Super Golf Tower activity. See page 43 for instructions on how to facilitate the activity.

Collect materials, make copies of the Challenge Letter and the Super Golf Tower handout, and organize staff into pairs. Then lead the activity, modeling how you would have your staff lead it with a group of kids. Make a point of asking questions to help participants reflect on what they’re doing or move past a “trouble spot” in the design process.



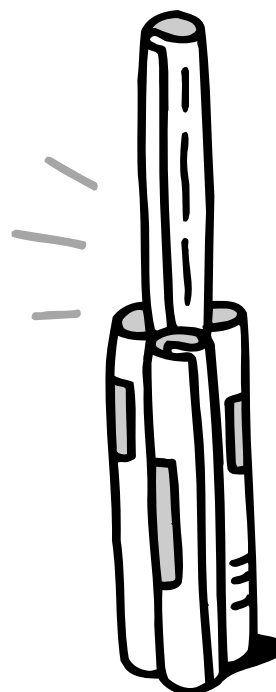
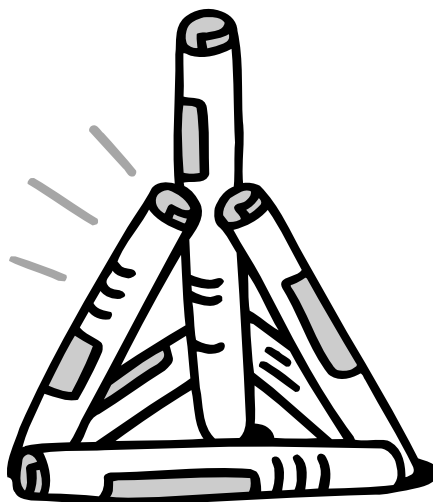
3 Group Discussion

Regroup to talk about the activity. Begin by discussing what it was like for staff to do the activity. What was fun? What was frustrating? What did they learn?

Briefly review the design process steps—define the problem, think of solutions and choose the best one, design and build, test, redesign, and share results. Then ask staff to identify when and how they engaged in these steps. Point out that Super Golf Tower, like all ClubZOOM activities, is divided into parts that mirror the design process: **Get Started** (define the problem and start thinking of solutions), **Design & Build, Test, Redesign, and Share Results.**

Next talk about leading the activity. You can also hand out copies of “Tips for Leading Hands-on Activities” (see next page) as a launch point for discussion or to take home for further reading. Here are some sample discussion questions.

- *What questions did I ask you during the activity? How did these questions affect the way you approached the activity?*
- *How would this activity be different if I demonstrated building a tower rather than letting you build your own tower?*
- *How would this activity be different if you were working alone instead of in pairs?*
- *How is this activity different from the way you were taught science in school?*
- *How would this activity be different if you were leading it with kids?*



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Tips for Leading Hands-On Activities

Hands-on activities are a great way to engage kids' interest and creativity. Here are some suggestions for making any activity easy to manage and full of learning opportunities.

1 Before the Activity

- Try every activity and watch the video** before doing it with kids. Then you will be able to anticipate where kids will need help. You can also make changes to the materials and instruction based on your setting.
- Read the Engineering Scoop.** You'll find basic explanations about the science and engineering behind the activities that can help you answer some of your kids' questions. If you can't answer a question, that's okay. Instead you can encourage curiosity and offer ways to seek information.
- Collect all materials.** Give yourself plenty of time to gather materials that may be hard to collect (like empty film canisters). You might also ask kids to collect certain materials from home.
- Divide materials into sets for each small team of kids.** Put each team's set of materials on their tables or on individual trays to make distribution easier.
- Invite older kids, parents, or other adults to assist.** You may find it helpful to have extra hands to help distribute materials and assist kids as they build.

2 Introducing the Activity

- Give clear instructions.** Fully explain the activity challenge. You can also show the video to introduce activity directions—just remember to stop the video before the cast members show their results.
- Form small teams of two to four kids** (choose the groups for them). Explain that real engineers also work in groups.
- Hand out materials only when you are ready to begin the activity.** As soon as you pass out the materials, kids are likely to start experimenting with them and may stop listening to you.
- Avoid presenting activities as team-against-team competitions.** In engineering, every design solution has benefits and drawbacks. Keep the teams focused on trying to improve their own designs rather than competing. Emphasize the cooperative nature of engineering.

3 During the Activity

- Walk around and ask kids to describe what they're doing.** Kids are sensitive about having the “right” answer, so emphasize the value of brainstorming, exploration, and sharing ideas, rather than right and wrong.
- Highlight when kids are following steps of the design process:** defining the problem, thinking of solutions, designing and building, testing, redesigning, and sharing results. This helps kids recognize that they are doing what engineers do.
- Ask open-ended questions to help put a team back on track,** rather than telling them what to do. Each ClubZOOM activity includes some suggested questions to ask.
- Point out a team's specific ideas to the whole group.** This tells kids that the activity can be done and that their ideas are valuable. Explain that sharing isn't “copying.” Engineers collaborate and build on each other's ideas all the time.
- Expect frustration.** Failure is an important part of engineering. Point out that engineers often learn much from mistakes and wrong turns when designing a solution. Then encourage kids to think of something to change and try again.
- Add new challenges for fast workers.** For example, “Now that your tower is 40 inches tall, what could you do to double that height?”

4 After the Activity

- Have kids assess what they've learned** by explaining why they think they got the results that they did. Ask: “What do you know now that you didn't know before the activity?”
- Connect the activity back to the real world.** Point out to kids that they've been working and thinking like engineers. If an engineer is visiting, he or she can help draw similarities between the activity and what engineers do in the field.
- Leave enough time at the end.** Remember to set aside time to summarize, reflect, and clean up.
- Allow kids to take home their final products to share with their families.** This way kids can feel like an expert at home, and their families can see what they are learning. Also, kids can teach what they learned to younger siblings and neighbors.

Part 3: Planning ClubZOOM

Now that your staff has tried out a ClubZOOM activity, explain how a typical ClubZOOM meeting works. You can walk them through the Leader's pages for Super Golf Tower or hand out photocopies of "How a ClubZOOM Meeting Works" (pages 7–10) to read. Be sure to cover all of the steps, from reading the Challenge Letter to doing the activity, cracking the Stay Tuned codes, and setting up the bulletin board. You can also watch the ClubZOOM video for a quick overview of all the activities. Conclude by having a planning discussion.



- *Talk about logistics. What's the best meeting space for the club?
 When will club meetings take place? How many kids can join?
 How many staff members are needed to lead the activities?*
- *What are good ways to let kids and families know about ClubZOOM?*
- *Who will be responsible for gathering materials, running meetings,
 contacting engineers, and maintaining the bulletin board?*
- *What materials will need to be collected early?*
- *How can we involve an engineer in some or all of the club meetings?
 (See pages 13–15 for more information on contacting volunteer engineers.)*
- *Are there ways we want to modify ClubZOOM for our kids and setting?*
- *Do we want to have books and Web sites about engineering available for
 kids? (See page 127 for suggestions.)*

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