

How to Facilitate a Discovery Activity



Volunteer Tips

Thank you for leading a Next Engineers Discovery Activity with a group of students. Young people benefit enormously from interacting with professionals and role models like you, and this kind of interaction can be all it takes to set them on course to become engineers themselves.

Engaging with a group of young people can be intimidating, even for practiced professionals. But there are a few tried and true principles and strategies you can use to help make sure that your time together is fun, fulfilling, productive, and inspirational for everyone.

- ✓ **Be present:** We all feel valued and valuable when someone directs their full and undivided attention to us. Value the young people with you by giving them your full attention for the entire session. The more present and engaged you are, the more present and engaged they are likely to be.
- ✓ **Be confident:** Young people tend to respond well to those who are confident in themselves and in what they know. One of the best ways to be confident is to be very well-prepared. It is essential to practice and rehearse the activity you are going to facilitate. Do the activity yourself. This will show you where students might struggle and what you can do to support them.
- ✓ **Be respectful:** This starts with how you dress and how you address young people. Dress like the professional you are. When you address young people, be open, authentic, and friendly. Take what young people say seriously. Even if something they say is completely wrong, you must avoid judgement. Never belittle or denigrate them. Demonstrate the respect you want young people to show you and that you want young people to show each other.
- ✓ **Be punctual:** This does not only mean arriving ahead of time to the venue to prepare and set-up. It also means starting and ending the activity on time and actively managing time during the activity.



- ✓ **Be student-centred:** The hands-on activity you are facilitating and all the effort you put into preparing for and running it are for the benefit of the young people and their learning. Learning is hard and risky, but it is also exciting and fulfilling. The more that young people feel they are in control of their learning, the more motivated they are to learn.
- ✓ **Ask open-ended questions:** Ask questions that require a full response rather than a simple yes/no or one word answer. Open questions allow you to gather evidence of what young people are thinking. To gather even more evidence, answer student questions with open questions of your own. Your open-ended questions can help young people to think through an issue or a problem for themselves. Often, by just leading students through their own thought process, they will be able to self-correct.

✔ **Listen actively:** Listening actively means doing more than just hearing what the young person is saying. It means paying attention to how they say it, as well as their facial expressions and body language. It means listening with the intention of fully understanding and validating the student. You can paraphrase back to them to check your understanding (“I think you said...”, “What I heard you say is...” or “By that I understand you to mean...”) or ask follow up questions (“Tell me more about...”, “Why do you think...” or “Explain why...”).

✔ **Silence is golden:** But not in the way you might think. A silent pause after asking a question, for example, can give young people the little extra time they need to discover what they think and organize their thoughts into a response. Giving them this time shows that you value and respect their response because you are willing to wait for it.

✔ **One thing at a time:** Especially if you are dealing with younger children, ask one question at a time or give one instruction at a time. Most people’s working memory is surprisingly limited. Too much information all at once is a sure recipe for confusion and disengagement. This also goes for when young people ask or answer questions. Move through one at a time. Everyone needs to be given a chance to speak.

✔ **Give constructive feedback:** Constructive feedback is hard to give but so worthwhile. Constructive feedback is specific, detailed, and encouraging. A simple ‘good job,’ while encouraging, does not tell the young person why you think the job they are doing is good, nor what they can do to keep improving. If you think someone can do better, tell them, but be sure to include why and how you think they can do better and give them small steps they can follow to improve. Even if the answer or outcome is wrong, constructive feedback can specifically highlight the value of the effort or energy the young person put in and encourage them to keep learning and improving.

✔ **Involve everyone:** It can be easy to allow a few individuals to dominate a group, but you need to guard against this. Let quiet or hesitant young people know that you value their contributions by giving them specific and directed opportunities to speak or contribute while letting them know that being quiet is also acceptable.

✔ **Encourage teamwork:** For much of the activity time, young people will be working in groups on their design challenges. Keep tabs on groups by constantly moving around the room, eavesdropping on their conversations, and observing what they are doing. Encourage discussions where everyone shares their knowledge, ideas, and insights. Remind young people that they will always get more done if everyone gets to participate and if they help one another.

✔ **Choose wisely:** When choosing an activity to implement, choose one you feel able to facilitate successfully and/or a topic that aligns with your expertise or background. Make sure you are comfortable with the content you will be delivering. To help ease the load, recruit a colleague to volunteer with you. Two are better than one.

✔ **Organize the space:** It really helps if you have seen the space you will be facilitating in beforehand and have had a chance (with permission, of course) to organize it according to your needs. It is important that you create a place where everyone can see you and you can see everyone. For instance, a circle of stations is better than rows.

✔ **Have fun:** Your enthusiasm is likely to rub off on young people.



✔ **Approach this experience like an engineer:** Engineers are very good at testing, analyzing, and iterating for improvement. Approach the process of facilitating hands-on activities in exactly the same way. Commit to facilitating the same activity more than once with different groups of young people and to reflect on the experience each time in order to make the next even better. After each time, ask what worked, what did not, why, what could be improved, and how. Facilitating groups of young people is an art but it is something that gets better and easier through reflection and practice.

Things to do to prepare

Good preparation is key. Being well-prepared will build your confidence and ensure that you and the young people have the best experience possible. Here are some suggested steps to take before the big day.

- **Confirm the logistics:** This includes the date, time, and location of the activity. Be sure to exchange contact information to communicate any schedule changes.
- **Confirm what sort of young people you will be facilitating:** How old are they? What language(s) do they speak? Where do they go to school? Do any have a disability or allergy that needs to be accommodated?
- **Visit the activity space:** If possible, visit the room, hall, or classroom to be used so you can see what it looks like, take note of what equipment and furniture are available, and inquire as to whether you can reorganize things if necessary. Try to imagine what the space will look like full of dozens of young engineers.
- **Practice and rehearse the activity:** Definitely, definitely do the activity yourself! This will let you see what young people are likely to struggle with and how you can support their learning. Think about and practice how you will share your own experience as an engineer or someone who supports engineers.



- **Confirm how many young people will be present:** This will allow you to organize or collect all the materials that you will need. If, after doing the activity yourself, you want to modify the materials list, feel free to do this.
- **Decide how you will create groups:** While you can let young people self-organize, this can be stressful for some and also result in groups without much diversity. One useful approach is to give each person a number corresponding to the number of groups you want and then to have all the 1's, 2's, 3's, etc., form groups.
- **Find out who will be responsible:** Know who the person (usually an educator) will be who is ultimately responsible for the young people in the room. Discuss any concerns either of you might have before the activity. These should include safety measures and disciplinary processes.

What to do when things go wrong

Good preparation is key. Being well-prepared will build your confidence and ensure that you and the young people have the best experience possible. Here are some suggested steps to take before the big day.

- **A group's design totally fails and they get discouraged:** Failure is a necessary part of almost all learning, and engineers fail all the time. Failure does not need to be fatal if it is seen as an opportunity to learn. If a group gets frustrated because its design does not work as expected, make sure that the group understands that they are not failures. Rather, focus on the lessons that they can learn from the experience and how they might improve in future. It can be particularly powerful if you share some of your failures and what you learned. It can be useful to include other groups in this discussion as well so that they too can learn. In this way, the one group's 'failure' becomes something valuable for everyone. Use the opportunity to reinforce the value of not knowing as the beginning of the journey.



- **Someone asks a question you cannot answer:** Nobody knows everything. Engineers know this as well as anyone because engineers are constantly seeking the answers to questions. If you don't know something, say so, but then engage the young person in how you or they could go about finding the answer. Use the opportunity to reinforce the value of not knowing as the beginning of the journey.
- **Someone gets injured:** It is important that you emphasize any safety measures that young people should be taking, but, occasionally, someone might get injured. Plan for this by knowing, in advance, who you should involve. As far as possible, keep the activity on track.
- **Someone gets off topic:** Validate the question or comment but be firm about bringing things back to the activity. You can say things like, "That's a really interesting comment/question. Perhaps we could talk about it more after the activity" or "Since our time is limited, we need to stay focused on the topic at hand."
- **Someone dominates a group or a conversation:** You need to be firm but gentle. You can say things like, "Who sees things differently?", "Let's hear from this side of the room," or "Let's hear what others think."
- **People talk at the same time:** Everyone talking or answering at the same time is often a sign that young people are excited about what they are doing. It is important not to squash this excitement but rather to help young people see that they can have a more productive conversation if everyone takes turns. You can explain that if people take turns, then all the great comments or questions can be heard.
- **Someone becomes disagreeable:** Disciplining any young person is not your responsibility but you also need to be careful not to let any disruptive behavior get in the way of others' positive experience. It can be useful to draw the person aside quietly and unobtrusively, if possible, and ask them why they feel angry or unhappy. Often, the problem can be resolved then and there. It is often enough just to make the person feel heard and understood.