



Engineers to the Rescue

A Girl's Extreme Survival Guide





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Our partnership with Girl Scout councils embodies the best in collaboration. We have shared resources and learned so much from teaming up on this project. Together we worked to inspire girls to change the world through engineering and science.



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About Techbridge

“Boring, nerdy, and only for boys.” Some girls may think of engineering in those terms, but not the girls participating in Techbridge. They say, “I learned that this science thing is very fun and educational at the same time. I LOVE IT!” and “I learned that engineering is not just for men.”

Techbridge is a leader in providing girls with firsthand experience working as engineers—from designing toys and building turbines, to meeting professional engineers who help make the world a better place.

Techbridge brings together best practices and lessons learned for partners and offers curriculum that builds on girls’ interests and expands their career options. We have seen first-hand the impact that role model visits and field trips can have. We offer training and resources to youth-serving adults to create positive experiences for girls.

The Techbridge program reaches out to girls in under-served communities and offers after-school and summer programs with hands-on projects and career exploration. Techbridge has served over 3,000 girls in elementary, middle, and high schools in Oakland, California and surrounding communities since its start in 2000. The program has been shown to increase girls’ confidence, build skills, and promote interest in careers in engineering, science, and technology.

In order to bring a Techbridge experience to girls across the country, we are partnering with Girl Scout councils. The Techbridge team has developed programs-in-a-box that include all the activities and materials you will need to introduce girls to the wonders of engineering and science. The Girls Go Techbridge program-in-a-box includes the leader guide you have in your hands, and the box of materials in front of you, ready for a group of ten girls to dive in and enjoy.

We invite you to partner with us to bring engineering and science to girls in your community. Together we can inspire a girl to change the world.

For more information, visit www.techbridgegirls.org.

Engineers to the Rescue: Suggested Schedule

Time	Session 1	Session 2	Session 3	Session 4	
:00	Pre-Surveys (if applicable)	Activity: Clean This Water	Career Activity: Your Career Card	Icebreaker: Fractured Facts	
:10	Icebreaker: Rescue Introduction			Activity: Give Me Shelter	Activity: Car to the Rescue
:20	Icebreaker: Design Your Tool		Career Activity: Tune in Techbridge		
:30					
:40	Career Activity: Tune in Techbridge				
:50		Icebreaker: Girl of the Year			
1:00	Post-Surveys				
1:10					
1:20					
1:30					

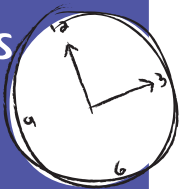
Engineers to the Rescue: Alternative Schedules

	6 Hours	4.5 Hours
:00	Icebreaker: Rescue Introduction	Icebreaker: Rescue Introduction
:10	Icebreaker: Design Your Tool	Activity: Wind-Powered Crank
:20	Activity: Wind-Powered Crank	
:30		
:40		
:50		
1:00		
1:10	Activity: Clean This Water	
1:20		
1:30		
1:40		
1:50		
2:00	Activity: Give Me Shelter	
2:10		
2:20		
2:30		
2:40		
2:50	Activity: Give Me Shelter	
3:00		
3:10		
3:20		
3:30		
3:40		
3:50	Activity: Car to the Rescue	
4:00		
4:10		
4:20		
4:30		
4:40	Career Activity: Tune in Techbridge	
4:50		
5:00		
5:10		
5:20		
5:30		
5:40	Icebreaker: Girl of the Year	
5:50		
6:00	Career Activity: Your Career Card	

Engineers to the Rescue: Introduction

4 Suggested Sessions

approximately 1 hour and 30 minutes each



Skills:

- Brainstorming
- Communication
- Teamwork
- Critical & Creative Thinking

The Scenario:

You're on a camping trip with your Girl Scout troop at Yellowstone National Park. Your first day at Yellowstone was incredible; you hiked all morning, saw Old Faithful in the afternoon, and sang campfire songs under the stars. You also visited the Visitor's Center, picked up a brochure, and met a park ranger. You learned that Yellowstone is situated on a bed of lava, and that minor earthquakes are frequent.

Although scientists didn't predict it, there was an earthquake which shook your tents for two minutes overnight. Unfortunately, this natural

disaster has broken the water pumps, and disrupted the generators in the park. To make matters worse, your cell phone battery is dead and you can't call for help. The worst part is your animal-proof food box fell down a ravine. You're hungry!

The good news is that your troop is safe, everyone is in good spirits, and women from the Society of Women Engineers (SWE) are on a leadership retreat—they are your neighbors at the campground! They have a lot of knowledge to offer as you rebuild your campground. Check out the backs of the career cards to hear from the SWE team.

As a troop, you must develop a wind-powered crank to lift your food box, create a water filter to clean water for drinking, build a shelter to withstand any aftershocks, and design a car prototype that will make it over the terrain to deliver your message to potential rescuers. You've got common sense, science smarts, and a group of skilled engineers to help you.

Good luck!

Meet the SWE* Team!

- Environmental Engineer, Cari Ishida
- Geologist, Jeanette Hummel
- Civil Engineer, Melanie Lapointe
- Mechanical Engineer, Judy Lee
- Structural Engineer, Kittrina McCourt

* Society of Women Engineers



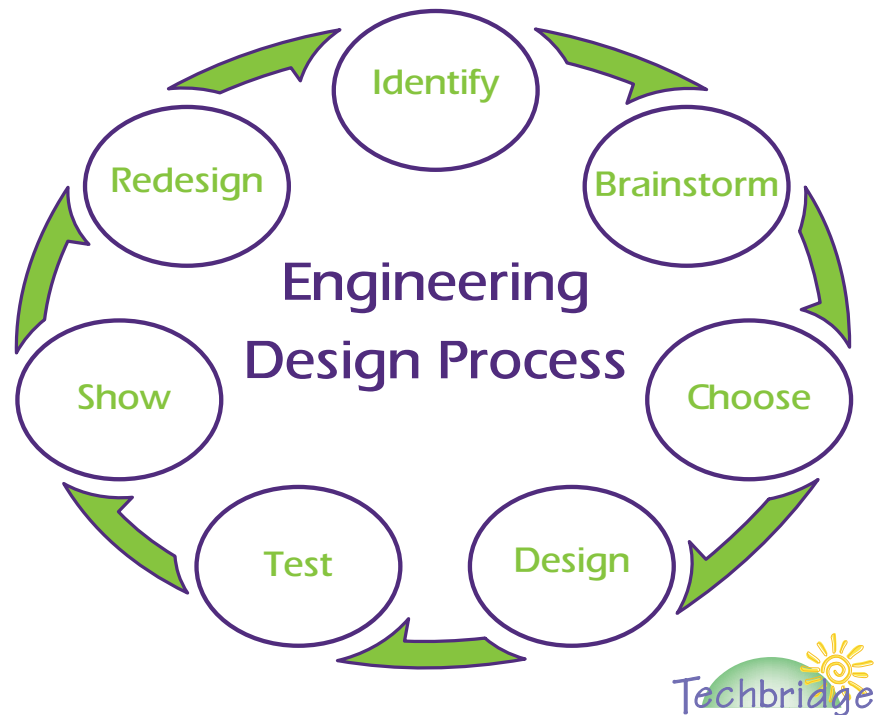
Engineers to the Rescue: Introduction

Engineering Design Process

The Techbridge **Engineering Design Process** is a never-ending cycle of creativity. With each of the hands-on activities in this guide, we encourage you to lead girls to identify and talk about where they are in the design cycle. Growing awareness of the design process helps girls strengthen their outcomes, whether it be a hand-made product or a presentation in front of a group.

The design process encourages girls to both “try, try again” and recognize that “two heads are better than one.” Engineers, and everyone from kids to professionals, use these steps to reach their desired result. We knew this was an effective tool when one Girl Scout remarked that she used the **Engineering Design Process** when writing and revising a paper for English class, and to persuade her parents to get a later curfew!

As the leader, you’ll have to know when it’s time to stop, but the more opportunities you allow girls to reflect, redesign, and repeat the design process steps, the better the experience for all. We recommend you display the supplied **Engineering Design Process** poster throughout these activities for easy reference.



Recommendations:

Throughout this project, emphasize the **Engineering Design Process** and the steps necessary to make an innovative, well-functioning design.



Girl Scout Leadership Experience

In 2008, Girl Scouts of the USA introduced fifteen Leadership Outcomes to help leaders create and recognize a successful Girl Scouting experience. You know your girls are enjoying a quality Girl Scout activity when an out-of-school experience is **girl-led, experiential, and cooperative**. You see that your girls are leaders when they:

Discover...

- Girls develop a strong sense of self
- Girls develop positive values
- Girls gain practical life skills
- Girls seek challenges in the world
- Girls develop critical thinking

Connect...

- Girls develop healthy relationships
- Girls promote cooperation and team building
- Girls can resolve conflicts
- Girls advance diversity in a multicultural world
- Girls feel connected to their communities, locally and globally

Take Action...

- Girls can identify community needs
- Girls are resourceful problem solvers
- Girls advocate for themselves and others, locally and globally
- Girls educate and inspire others to act
- Girls feel empowered to make a difference in the world

We are proud that Techbridge's hands-on activities meet many of the Girl Scout Leadership Experience (GSLE) outcomes. Girls **gain practical life skills and develop critical thinking** abilities as they work through design challenges in our programs-in-a-box. By testing and redesigning their products, working through the **Engineering Design Process**, girls thrive on **challenges**, conquer doubts, and gain confidence and new perspective.

Girls **develop healthy relationships, learn to cooperate, and resolve conflicts** as they share, brainstorm, and negotiate in teams and pairs during Girls Go Techbridge activities. To build connectedness with your community, we encourage you to invite role models in engineering to interact with your girls. Remind your guest engineers to share that they are members of the very same community as your girls, and that together we can all be problem-solvers for the issues facing our world.

We hope, through the reflection and active questioning built into the Girls Go Techbridge activities, you will lead your girls to **identify community needs, educate and inspire others, and feel empowered** to make a difference in the world. While our hands-on-activities are presented in the context of having fun in an informal learning environment, there are real-world applications. With the skills and concepts learned by working through this program-in-a-box, girls gain the tools to make the world a better place.

Our mission at Techbridge is to **inspire a girl to change the world**. Thank you for sparking the fire for change.