



Junior Product Designer Badge Activity Plan 1

Badge Purpose: When girls have earned this badge, they'll know how to think like a product designer.

Planning Guides Link: Science, Technology, Engineering and Math

Fun Patch Link: Problem Solving

Activity Plan Length: 1.5 hours

Involve Family and Friends: Participation from family and friends can enrich your troop's Girl Scout experience, both for the girls and for you. Use the suggestions below to make it easier for you to connect with additional support.

- Before the meeting:
 - Send a note to families to find those with interest in or expertise with the topic. Ask them to lead or support an activity or two, or even lead the whole meeting.
 - Offer this activity plan as a starting place and point out that they may choose alternative activities using the *Customize It!* section as a guide. For example: If an activity plan directs girls to sit outside and observe animal habitats, you may choose to go to the zoo and learn about animal habitats there instead.
- At home:
 - Encourage families to ask questions about their girls' badge activities. Some examples that work for any badge include: What did you learn? What surprised you? What does it make you think of trying next?
- Throughout the year:
 - Suggest to families ways that girls can share or display their Girl Scout accomplishments. Possibilities include a bulletin board, a scrapbook, a special memories box or family sharing time.

Girls Take the Lead: Include girl leadership through long-term planning, short-term meeting prep and specific activities at meetings.

- Long Term Planning
 - If you use "Plan Your Brownie Year", share this with the girls at the start of the year. Have them ask friends and family to help out with specific meetings or activities. Let the girls brainstorm ways to make the plans their own, such as thinking of related field trip activities. If a girl has experience with a field trip, ask her to be assistant tour guide.
 - If you are adapting the "Plan Your Brownie Year", get the girls' input on which badges to choose. Offer just a few choices in each category or timeframe to make decisions easier. Every girl should have at least one badge or journey she's excited about.
- Short Term Planning
 - Ask a family to help lead a badge. Make sure they have access to activity plans and any resources you might have. Keep additional requested materials to a minimum.
 - Choose two helpers to stay after a meeting for 15 minutes. Give them each an activity to introduce and either instruct or help guide at the next meeting.
 - Before a meeting, ask everyone to vote on some aspect of the activity: draw posters or perform skits, open with a song or game, etc.

- Use a rotating list of helper tasks, called a 'kaper chart', to share responsibilities. Examples include acting as emcee of the meeting, leading an opening game, bringing a snack next meeting or taking attendance.
- At the Meeting
 - During the opening, have 1-2 girls share their answers to a get-to-know-you question.
 - Have girls fulfill their kaper chart responsibilities.

Try to find something in each activity that you can let girls decide or manage.

Customize It: If your group wants to expand work on this badge or simply try different activities, go for it! There are many ways to earn this award, including: completing the activities as listed in the Junior Skill-Building Badge set for *It's Your Story—Tell It!*, completing two of these activity plans, attending a council-sponsored event or customizing activities. Pick the one(s) that work best for your group. Girls will know they have earned the award if:

- They have identified tools, machines or innovations that are successful
- They have researched common needs and proposed solutions
- They have put their plans into action, tested the results and made new plans or revisions

Tips and Tools

- Check out ways to stay safe using Safety-Wise at <http://gsrv.gs/safetywise>.
- Ensure that your activities are accessible to everyone. Ask in advance if any special accommodations need to be made. If you have questions regarding specific adaptations, please contact River Valleys at 800-845-0787.

Resources

- This activity plan has been adapted from the Junior Skill-Building Badge set for the *It's Your Story—Tell It!* Product Designer Badge, which can be used for additional information and activities.

Getting Started

Time Allotment: 15 minutes

Materials Needed:

- Optional: Girl Scout Promise and Law printed out on poster board

Steps:

- Welcome everyone to the meeting.
- Recite the Girl Scout Promise and Law. Use repeat-after-me or say it as a group if girls know it by heart.

Girl Scout Promise	Girl Scout Law
<i>On my honor, I will try:</i> To serve God and my country, To help people at all times, And to live by the Girl Scout Law.	<i>I will do my best to be</i> honest and fair, friendly and helpful, considerate and caring, courageous and strong, and responsible for what I say and do, <i>and to</i> respect myself and others, respect authority, use resources wisely, make the world a better place, and be a sister to every Girl Scout.

- Use the song “Boom Chick A Boom” as an example of using the same thing in new ways (the song is a repeat-after-me, and it’s chanted rather than sung, so it doesn’t matter if anyone knows it already).

Boom Chick A Boom

I said a boom chick-a-boom (repeat)

I said a boom chick-a-boom (repeat)

I said a boom-a chick-a-rock-a, chick-a-rock-a, chick-a-boom (repeat)

Uh-huh (repeat)

Oh yeah (repeat)

One more time (repeat)

Other verses: In a very loud voice

In a very high voice

In a very low voice

Underwater style (move index finger up and down over lips to make bubbling sound)

Janitor style (change “boom” to “broom” and “rock” to “mop”)

Motorcycle style (change “boom” to “vroom” and “rock” to “stop”)

...or add your own

Last verse: use, “no more times” instead of, “one more time.”

Transition to Activity #1: “We just did the same song in lots of different ways. For the rest of today, we are going to try to see things in a new light, whether it’s a problem that needs solving or a tool or product that can be improved.”

Activity #1: Introduction to SCAMPER

Badge Connection: Step 1—Observe what makes a good product

Time Allotment: 15 minutes

Prep Needed:

- Gather materials and supplies.
- Make a large poster with the SCAMPER acronym, unless you plan to write it out in front of the group during the activity.

- SCAMPER

- S—Substitute
- C—Combine
- A—Adapt
- M—Magnify
- P—Put to other uses
- E—Eliminate or minimize
- R—Rearrange or reverse

Materials Needed:

- Large paper
- Markers/drawing supplies
- Common household objects or pictures from magazines

Steps:

1. Divide into teams of about 4 girls.
2. Give each team an object or picture, or offer a choice of a few to each group. Each team also needs paper and markers.
3. New designs almost always have some connection to something that has worked in the past. In order to replace the old technology, the new product has to be at least as good as the old one, while improving some aspect, such as making a task faster or take less work, using less expensive material, or being stronger and more durable.
4. These types of changes can typically be summed up by the letters in SCAMPER. Here are examples of questions that fit each of the SCAMPER categories:
 - S—Substitute: Can I replace one part for something else? Can I use a different material? Can I change the shape, color, texture or sound?
 - C—Combine: Can some of the parts be mixed together to make one new part? What other objects can I mix with it? Can I combine multiple jobs or purposes to be accomplished by the same thing?
 - A—Adapt: What other product uses something similar, and how can I borrow that idea? Has something in the past solved a similar problem?
 - M—Magnify: Can some or all of it be bigger, taller or longer? Can there be more of them or have more parts or added features? Should some part be exaggerated or emphasized?
 - P—Put to other uses: If I didn't know what it was, what might I think it was? How would someone much older, much younger or with different abilities than me use it? What else does it remind me of?
 - E—Eliminate or minimize: What part could I take out and still have it work? Can the rules or uses be easier? Can it be split into smaller parts or made simpler?
 - R—Rearrange or reverse: Can I turn it backwards, upside down or inside out? Can I turn cause into effect? Can I make one of its negatives into a positive?
5. Give teams a time limit of 10 minutes, which you may expand (M—Magnify) or limit (E—Eliminate) depending on how the groups are doing.
6. For the first seven minutes, each group's task is to propose at least one revision for their product using each of the letters of SCAMPER if they can. However, if they have a lot of ideas for one category, they can spend some extra time on one and less on the others.
7. For the last three minutes, each girl should sketch a small diagram or write a few words about one of the adaptations they mentioned on the large paper. There can be duplicates, so there is no need for girls to argue about who gets to do their favorite.

Activity #2: Bird's Tool Box

Badge Connection: Step 3—Figure out what's working

Time Allotment: 15 minutes

Prep Needed:

- Gather materials and supplies. Allow some time at the site to spread out all of the supplies.
- **Note:** a copy of the instructions and many of the tools used in this activity are in the Birds OTTERS kit available at River Valleys' five service centers, along with more activities and background. Call 800-845-0787 to check out the Birds OTTERS kit at your nearest service center.

Materials Needed:

- Household tools that resemble bird beaks, with at least enough for every girl to have one:
 - Pliers or nutcrackers—cardinal or other seed eaters
 - Strainer or aquarium nets—ducks
 - Long eyedropper or turkey baster—hummingbird
 - Tweezers or needle nose pliers—woodpecker
 - Chopsticks—robin
 - Plain envelope—swallow
- Simulated food items for the bird beaks to try to "eat." Make identification signs for each:
 - *Nuts or seeds* in shell (the tool must do more than just pick up the shell; it must be able to open the shell and get the nut inside)
 - Tiny bits of torn up sponge, packing peanuts, or other things that float, in a bucket or tub of water—*duckweed and other aquatic plants*
 - Water in a vase—*nectar in a flower* (make sure the eyedropper or baster fits inside the vase)
 - Gummi candy or small bits of pipe cleaner stuffed inside holes of a natural sponge—*grubs in rotten log*
 - Gummi worms or bits of pipe cleaner in shallow pan of oatmeal or cornmeal—*worms in the mud*
 - Popcorn (which has to be thrown and caught in mid-air) —flying insects
- **Note:** if you have a small group, you can have everyone try to pick up one given food together, and then you can put that away and pull out another. With more girls, you will want to spread the food choices out at stations, and have small groups of girls rotate from one to the next.

Steps:

1. Pass out one bird beak tool to each girl.
2. Ask the group if they have a favorite food. Now imagine that you only ever eat that food, and so does your whole family. Are there now some appliances, utensils or dishes in your kitchen that you wouldn't use anymore? Some tools are very specific; they can only be used for one thing. Others are best for some things, but can still be used for other jobs even if they aren't the best tools.
3. Tell them to imagine that they are birds and the tools in their hands are actually their beaks. Do they have any guesses as to what kind of bird they might be?
4. Ask one small team of girls to demonstrate by bringing them to one station. Read off the ID sign to explain what kind of food it is. Have each girl attempt to pick up or capture the food in her "beak". Decide as a team: which was the best beak for eating this food?
5. Divide into small groups and have each group start at a station. Give girls about a minute to experiment with their beaks and decide on a best choice.
6. Rotate stations until small groups have tried out all of the food items.
7. At the end, have every individual girl stand by the station that seems like her bird's "favorite" or best option. There might be more than one good choice, but they should stand at only one.
8. Ask the girls at each station what kinds of birds they have seen or have heard would eat the food at their station. When they're finished, give the activity's standard answer for each beak tool, but point out that these are only some possible answers; none of the tools are exact matches for a bird beak.
9. Inventing is often about coming up with a new use for an old tool. Grouped by favorite food, have the girls brainstorm together and come up with at least three other jobs they could do with their bird beak/tool. If any stations have only one girl, encourage her to pick a next-best food and help that group brainstorm.

Activity #3: What Else Can It Do?

Badge Connection: Step 4—Innovate to find solutions

Time Allotment: 15 minutes

Prep Needed:

- Gather materials and supplies.

Materials Needed:

- A variety of household tools, appliances or objects
- Paper
- Drawing utensils
- Rulers, tracing templates/stencils or other drawing aids
- Pictures of everyday objects being used for new tasks (below)

Steps:

1. Inventions that have a great impact often are simple objects that help with ordinary tasks but are used in a new way. Hand out paper and pencils, and have the girls take a minute to record some of the tasks they do every day or almost every day, such as brush their teeth, walk the dog, get to school, turn in homework, set the table and so on.
2. Now, choose one of the pictures of new uses for household items. Read the problem aloud and ask how many girls have seen or heard of the problem before. Then, show the picture and describe the solution. Ask if they have tried that solution, or if the picture makes them think of any other possible answers.
3. Go through the other examples briefly, and leave them out on the tables for the girls to check out later.
4. Tell the girls that their task is to come up with a solution to an everyday problem using an ordinary object in a new way. They can go through the collection of tools you brought or think of their own. They can consult their list of everyday tasks or add a new task they think they can address.
5. Once a girl has a possible solution, she should draw a picture or diagram of how her tool works in the new situation. Rulers can help with both scale and straight lines, and stencils for simple shapes or house blueprints can help girls feel more confident about their diagrams' accuracy. If the tool they want is among those you brought, they might be able to test the solution right away.

Activity #4: Snack Chat

Badge Connection: Questions link to multiple badge steps

Time Allotment: 15 minutes

Steps:

1. While enjoying snack, review the SCAMPER questions. How could our snack be modified in one of these ways? Would it be an improvement, or would the food lose some of its positive traits?

Wrapping Up

Time Allotment: 15 minutes

Materials Needed:

- Optional: Make New Friends printed on poster board

Steps:

- Instruct girls to get into a Friendship Circle. Have girls stand in a circle and cross their right arms over their left, holding hands with the person on each side of them.

- Sing “Make New Friends.”

Make New Friends		
Verse One	Verse Two	Verse Three
Make new friends, but keep the old. One is silver, the other is gold.	A circle is round, it has no end. That's how long, I will be your friend.	You have one hand, I have the other. Put them together, We have each other.

- After the song, ask everyone to be quiet.
- Assign one girl to start the friendship squeeze by gently squeezing her neighbor’s hand with her right hand. Then, that girl squeezes with her right hand. One by one, each girl passes the squeeze until it travels around the circle. When the squeeze returns to the girl who started, she says “Goodbye Sister Girl Scouts” and the girls unwrap and face outward instead of inward.
- Optional: Have girls make a wish after their hand has been squeezed and before they pass the squeeze along. Girls can also put their right foot out into the circle when they receive the friendship squeeze, so that everyone can see it travel along the circle.

More to Explore

- Field Trip Ideas:
 - Visit an historic site that shows how daily tasks were accomplished years ago. Compare to solutions we use today. What hasn't changed? What has been replaced, but may still be useful or even have advantages?
- Speaker Ideas:
 - Invite someone to your meeting who makes up their own recipes or craft patterns, or fixes or rebuilds cars.
 - Talk to someone active in improvisational theater. What helps them to come up ideas?

Suggestions

Do you have any suggestions to improve this activity plan? Do you have ideas for other possible badge-earning activities? Please email troopsupport@girlscoutsrv.org.

Family Follow-Up Email

Use the email below as a template to let families know what girls did at the meeting today. Feel free to add additional information, including:

- When and where you will be meeting next
- What activities you will do at the next meeting
- Family help or assistance that is needed
- Supplies or materials that girls will need to bring to the next meeting
- Reminders about important dates and upcoming activities

Hello Girl Scout Families:

We had a wonderful time today learning about inventing and problem solving and are on our way to earning the Product Designer Badge.

We had fun:

- Looking at familiar things in new ways
- Finding the right tool for the right task
- Making plans for solving problems

Continue the fun at home:

- Help your Girl Scout keep track of her morning routine for a week. Each day, have her come up with one task or issue that she would like to change. At the end of the week, look over the list and brainstorm possible solutions.
- Have your Girl Scout help you the next time you complete a household chore, and show her what tools and products help you to finish the job.
- Look through the *Girl's Guide to Girl Scouting* with your Junior to find other activities you can try at home.

Thank you for bringing your Junior to Girl Scouts!

Innovations with Household Objects

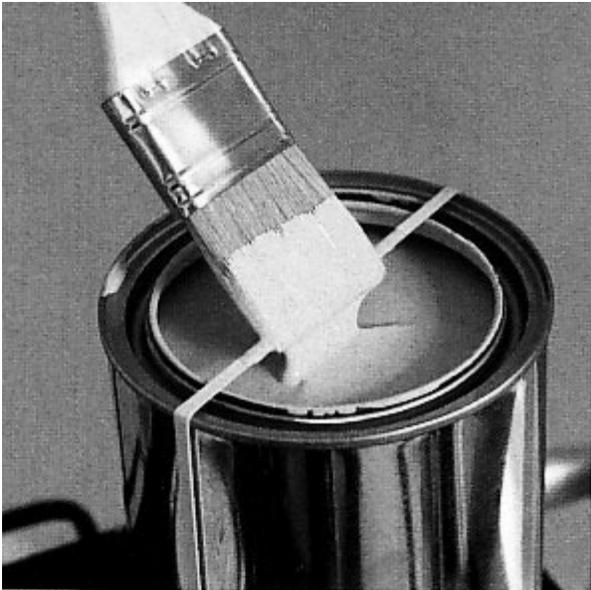
Problem: shoes in the dryer make too much noise

Solution:



Problem: Taking the extra paint off a flat paint brush with a curved can always leaves some in the rim, which glues on the paint can lid on so you can't get it open again.

Solution:



Problem: Keeping a key ring open to insert a new key is frustrating.

Solution:



Problem: Drilling into the wall leaves bits of drywall or wood dust all over to clean up.

Solution:



Problem: You can't fit large water containers like mop buckets into the average bathroom sink.

Solution:



Problem: Holding onto tiny nails is a good way to smash your fingers.

Solution:

