

JUNIOR PRODUCT DESIGNER BADGE – MEETING 1

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

Activity Plan Length: 1.5 hours

| Time | Activity | Materials Needed |
|------------|---|---|
| 15 minutes | Getting Started <ul style="list-style-type: none"> Girls recite the Girl Scout Promise + Law. | <input type="checkbox"/> (Optional) Girl Scout Promise and Law poster |
| 15 minutes | Introduction to SCAMPER <ul style="list-style-type: none"> Girls observe what makes a good product. | <input type="checkbox"/> Large paper <input type="checkbox"/> Markers/drawing supplies <input type="checkbox"/> Common household objects or pictures from magazines |
| 15 minutes | Bird’s Tool Box <ul style="list-style-type: none"> Girls figure out what’s working. | <input type="checkbox"/> Household tools that resemble bird beaks (at least one for every girl) <input type="checkbox"/> Simulated food items for bird beaks to try to “eat” |
| 15 minutes | What Else Can It Do? <ul style="list-style-type: none"> Girls innovate to find solutions. | <input type="checkbox"/> A variety of household tools, appliances, or objects <input type="checkbox"/> Paper <input type="checkbox"/> Drawing utensils <input type="checkbox"/> Rules, tracing templates/stencils, or other drawing aids <input type="checkbox"/> Pictures of everyday objects being used for new tasks |
| 15 minutes | Snack Chat <ul style="list-style-type: none"> Girls enjoy snack while discussing what they have learned. | <input type="checkbox"/> Healthy snack |
| 15 minutes | Wrapping Up | <input type="checkbox"/> (Optional) Make New Friends lyrics poster |

Getting Started

Time: 15 minutes

Materials Needed: (Optional) Girl Scout Promise and Law poster

Welcome everyone to the meeting, recite the Girl Scout Promise and Law.



Activity #1: Introduction to SCAMPER

Time: 15 minutes

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

Materials Needed: Large paper; markers/drawing supplies; common household objects or pictures from magazines

Prep Needed:

- 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
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

Time: 15 minutes

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

Materials Needed: Household tools; simulated food items

Prep Needed:

- Allow some time at the site to spread out all of the supplies.
- Each girl should have at least one household tool that resembles a bird beak:
 - 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
- Make identification signs for each of the simulated food items for bird beaks to try to “eat”:
 - Nuts of 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

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.

NOTES: 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.



Activity #3: What Else Can It Do?

Time: 15 minutes

Badge Connection: Step 4 – Innovate to find solutions

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

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 and Friendship Pledge

Time: 15 minutes

Badge Connection: Questions link to multiple badge steps

Materials Needed: Healthy snack

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: 15 minutes

Materials Needed: (Optional) Make New Friends lyrics

Close the meeting by singing Make New Friends and doing a friendship 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 with ideas?



Innovations with Household Objects

Problem: Shoes make too much noise in the dryer.

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 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 containers like mop buckets into the average bathroom sink.

Solution:



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

Solution:

