



## Brownie Home Scientist Badge Activity Plan 2

**Badge Purpose:** When girls have earned this badge, they'll be able to see the science all around them.

**Planning Guides Link:** Science, Technology, Engineering and Math

**Fun Patch Link:** Kitchen Chemistry

**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 *Brownie Girl's Guide to Girl Scouting*, 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 can explain how they use science in their lives in multiple ways, including cooking and fun
- They can explain several simple scientific concepts such as static electricity, density and chemical reactions

### 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 *Brownie Girl's Guide to Girl Scouting* Home Scientist Badge, which can be used for additional information and activities.
- For more information about fun and simple science experiments, go to the PBS Zoom webpage at [pbskids.org/zoom](http://pbskids.org/zoom).

## Getting Started

Time Allotment: 15 minutes

Materials Needed:

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

Steps:

1. Welcome everyone to the meeting.
2. 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.

3. Sing the Brownie Smile Song. Use repeat-after-me or sing as a group if girls know it by heart.

The Brownie Smile Song
I've got something in my pocket It belongs across my face I keep it very close at hand In a most convenient place I'm sure you wouldn't guess it If you guessed a long, long while So I'll take it out and put it on It's a great big Brownie Smile!

## Activity #1: Balloon Race

Badge Connection: Step 4— Make something bubble up

Time Allotment: 15 minutes

Prep Needed:

- Gather materials and supplies.
- Lay the tablecloths out where girls will be working.
- Take out six small cups. If you have more than 9 girls, you will need to make cups for extra groups. In the cups, put:
  - 2 Tbsp. vinegar
  - 1 Tbsp. baking soda
  - 2 Tbsp. diet cola
  - 1 Mentos candy
  - 1 tablet of Alka-Seltzer, crushed
  - 2 Tbsp. diet cola

Materials Needed:

- Paper towels
- Plastic tablecloths
- Clean, empty plastic soda bottles—approximately 20 ounce size (one per group)
- Balloons (one per group)
- Small cups—approximately 3 ounce size (one-two per group)

- Vinegar
- Baking Soda
- Alka-Seltzer
- Yeast
- Diet cola
- Mentos

Steps:

1. Explain to the girls that they are going to make some chemical reactions. A chemical reaction happens when two things are put together and they form something new. It is clear that a chemical reaction has occurred if something produces heat, changes color or makes a gas.
2. Split the girls into three groups. If you have more than nine girls, you can make extra groups.
3. Give each group a plastic soda bottle and a balloon. Additionally, give each group one of the three following combinations of prepared cups. Be sure that each combination is being used by at least one group.
  - A cup of Alka-Seltzer and a cup of water
  - A cup of vinegar and a cup of baking soda
  - A cup of diet cola and a Mentos candy
4. Ask each group to look at their materials and say what they think they have in their cups. What do they think will happen when they combine their materials?
5. Tell girls that when you give them the signal, they should put the contents of their cups into their bottle and put the balloon over the opening as fast as possible. They may need assistance from an adult.
6. All the balloons should blow up. The size and speed of the inflation will depend on which reaction is taking place and how fast girls put the balloon on. Give the reactions time to finish. Have groups observe their own bottle and the other groups' bottles.
7. Remind the girls there are several ways to tell if a chemical reaction is taking place and one of those signs is when a gas is produced. Ask girls which combination of materials produced the strongest reaction and why.
8. Have the girls clean up their areas.

**Activity #2: Glurch**

Badge Connection: Step 5—Play with science

Time Allotment: 25 minutes

Prep Needed:

- Gather materials and supplies.

Materials Needed:

- White glue (approximately 1/8 cup per girl)
- Liquid starch (approximately 1/4 cup per girl)
- Salt
- Small bowls
- Spoons
- Water
- Wax paper (12"x12" square per girl)
- Small plastic zipper bags (one per girl)
- Permanent marker
- Optional: food coloring

Steps:

1. Give each girl a small bowl and a spoon. In each bowl, add 1/8 cup glue, a pinch of salt, and 1-2 drops of food coloring (optional).
2. Have the girls stir until combined. Slowly add 1/4 cup liquid starch to each bowl as the girls continue stirring.
3. After a short time, each girl should have a "glob" of putty in her bowl. Have the girls grab this glob and knead it on the wax paper.

4. After the girls all have a putty-like substance, have them experiment with it. Does it stretch? Does it run? Can they use it to pick things up? Explain that Glurch is a kind of chemical called a colloid. It has some properties of a liquid and some properties of a solid.
5. When the girls are finished playing with the Glurch, help them put it into plastic zipper bags on which they have written their names.
6. When they are done, girls should go wash their hands for snack.

#### **Activity #4: Snack Chat**

Badge Connection: Questions link to multiple badge steps

Time Allotment: 15 minutes

Steps:

1. While enjoying snack, here are some things for girls to discuss:
  - Can anyone else think of a toy that uses science? What about spinning toys?
  - Another way to tell if there's been a chemical reaction is if something changes color. Have you ever seen anyone mix two things together that changed color? What were they?
  - Chemical reactions also produce heat. Has anyone ever seen something heat up using chemicals instead of a stove or microwave or other appliance (hand warmers are a good example)? What was it?

#### **Activity #5: Water Mazes**

Badge Connection: Step 5—Play with science

Time Allotment: 10 minutes

Prep Needed:

- Gather materials and supplies.
- Make copies of the mazes on paper or cardstock (one per one to two girls) and cut each maze out around the black line.
- Put each maze into a separate plastic zipper bag.
- Optional: you can laminate the cards rather than put them in a zipper bag.

Materials Needed:

- Small plastic zipper bags
- Mazes
- Cardstock or paper
- Scissors
- Small straws
- Water

Steps:

1. Explain to the girls that while water may not seem very exciting, it actually has some very special properties. Three of these fun properties are:
  - Cohesion—the molecules (tiny pieces) of the water stick to each other.
  - Adhesion—the molecules of the water stick to other surfaces.
  - Surface Tension—the molecules on the water's surface stick to each other forming a "skin."
2. Tell the girls that you are going to use these three properties to play with water. Give each girl or pair of girls a maze in a plastic bag or a laminated maze.
3. Use the straw(s) to put a droplet of water in the colored portion of the maze, near the edge of the card.
4. Tell girls that the object is to get the water to drip off the other side of the card without touching the white portion of the maze.
5. When girls have completed their mazes, have them trade for a different one as time allows.

## Wrapping Up

Time Allotment: 15 minutes

Materials Needed:

- Optional: Make New Friends printed on poster board

Steps:

1. 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.
2. 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.

3. After the song, ask everyone to be quiet.
4. Assign a 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.
5. 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 a toy store and try to identify all the toys that use science.
  - Visit a university chemistry department to see all the fun reactions they can make.
- Speaker Ideas:
  - Invite a lab technician from a local factory or plant to your meeting to talk about what they do.

## Suggestions

Do you have any suggestions to improve this activity plan? Do you have ideas for other possible badge-earning activities? Please email [troopsupport@girlscoutsv.org](mailto:troopsupport@girlscoutsv.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 everyday science and have earned the Home Scientist Badge.

We had fun:

- Blowing up balloons with chemistry
- Making and testing a toy called Glurch using science
- Having fun with water mazes

Continue the fun at home:

- Visit [pbskids.org/zoom](http://pbskids.org/zoom) for more great science experiments you can do with your Girl Scout at home.
- Try making dinosaur snot and putty with your Girl Scout. The recipes are found in the *Girl's Guide to Girl Scouting*.
- Look through the *Girl's Guide to Girl Scouting* with your Brownie to find other activities to try at home.

Thank you for bringing your Brownie to Girl Scouts!

Water Mazes







