

BROWNIE HOME SCIENTIST BADGE – MEETING 2

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

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 and sing the Brownie Smile song. | <input type="checkbox"/> (Optional) Girl Scout Promise and Law poster <input type="checkbox"/> (Optional) Brownie Smile song lyrics poster |
| 15 minutes | Balloon Race <ul style="list-style-type: none"> Girls experiment with chemical reactions. | <input type="checkbox"/> Paper towels <input type="checkbox"/> Plastic tablecloths <input type="checkbox"/> One clean, empty, plastic soda bottle (approximately 3 oz. size) for every group of 3 girls <input type="checkbox"/> Plastic cups (for dividing ingredients) <input type="checkbox"/> Vinegar <input type="checkbox"/> Baking soda <input type="checkbox"/> Alka-Seltzer <input type="checkbox"/> Yeast <input type="checkbox"/> Diet cola <input type="checkbox"/> Mentos candy |
| 25 minutes | Glurch <ul style="list-style-type: none"> Girls create and experiment with a new substance. | <input type="checkbox"/> White glue (approximately 1/8 cup per girl) <input type="checkbox"/> Liquid starch (approximately 1/4 cup per girl) <input type="checkbox"/> Salt <input type="checkbox"/> Small bowls <input type="checkbox"/> Spoons <input type="checkbox"/> Water <input type="checkbox"/> Wax paper (one 12"x12" square per girl) <input type="checkbox"/> Small plastic zipper bags (one per girl) <input type="checkbox"/> Permanent marker <input type="checkbox"/> (Optional) Food coloring |
| 15 minutes | Snack Chat <ul style="list-style-type: none"> Girls enjoy snack and discuss science and chemical reactions. | <input type="checkbox"/> Snack |
| 15 minutes | Water Mazes <ul style="list-style-type: none"> Girls learn about and experiment with water. | <input type="checkbox"/> Maze (one per girl or pair of girls) <input type="checkbox"/> Sheet protector (one per maze) <input type="checkbox"/> Cardstock or paper <input type="checkbox"/> Small straws <input type="checkbox"/> Water |
| 15 minutes | Wrapping Up | <input type="checkbox"/> (Optional) Make New Friends song lyrics poster |



Getting Started

Time: 15 minutes

Materials Needed: (Optional) Girl Scout Promise and Law poster and (optional) Brownie Smile song lyrics poster

Welcome everyone to the meeting, recite the Girl Scout Promise and Law, and sing the Brownie Smile song.

Activity #1: Balloon Race

Time: 15 minutes

Badge Connection: Step 4 — Make something bubble up

Materials Needed: Paper towels; plastic tablecloths; plastic cups; one clean, empty, plastic soda bottle (approximately 3 oz. size) for every group of 3 girls; vinegar; baking soda; Alka-Seltzer; yeast; diet cola; Mentos candy

Prep Needed:

- Place tablecloths over tables.
- Take out six small cups. If you have more than nine girls, you will need to make cups for extra groups. Separate the ingredients into the cups in the following amounts:
 - 2 tablespoons vinegar
 - 1 tablespoon baking soda
 - 2 tablespoons diet cola
 - 1 Mentos candy
 - 1 tablet of Alka-Seltzer, crushed
 - 2 tablespoons diet cola

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. Then give each group one of the three following combinations of prepared cups. Be sure that at least one group is using each combination.
 - 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

Time: 25 minutes

Badge Connection: Step 5 — Play with science

Materials Needed: White glue (approximately 1/8 cup per girl); liquid starch (approximately ¼ cup per girl); salt; small bowls; spoons; water; wax paper (one 12"x12" square per girl); small plastic zipper bags (one per girl); permanent marker; (optional) food coloring

1. Give each girl a small bowl and a spoon. In each bowl, add 1/8 cup glue, a pinch of salt, and, if using, 1-2 drops of food coloring.
2. Have the girls stir the mixture until it's well combined. Slowly add ¼ cup of 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 and write their names on the outside.
6. When they are done, girls should go wash their hands for snack.

Activity #3: Snack Chat

Time: 15 minutes

Badge Connection: Questions link to multiple badge steps

Materials Needed: Healthy snack

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 #4: Water Mazes

Time: 15 minutes

Badge Connection: Step 5 — Play with science

Materials Needed: Sheet protector; mazes; small straws or water dropper; water; paper; markers

Prep Needed:

- Make copies of the maze on paper or cardstock (either one for each girl or one per pair of girls).
 - Put each maze into a plastic sheet protector. Tape the top, if you wish to reuse the mazes in the future.
1. Explain to the girls that while water may not seem very exciting, it has some very special properties. Three of these fun properties are:
 - Cohesion—the molecules (tiny parts) 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 every girl or pair of girls a maze in a sheet protector.



3. Use the straw(s) to put a medium-sized droplet of water at the top portion of the maze (where it says “start”). To do this, hold the straw blocking one end with pointer finger; with thumb and middle finger squeeze gently, sucking up water into the straw. Carefully squeeze the straw, dropping out a droplet of water at the top of the sheet of paper.
4. Tell girls that the object is to get the water droplet through the maze to “put out the fire” at the end.
5. If girls are looking for an added challenge, provide them paper and markers to create their own maze.

Wrapping Up

Time: 15 minutes

Materials Needed: (Optional) Make New Friends song lyrics poster

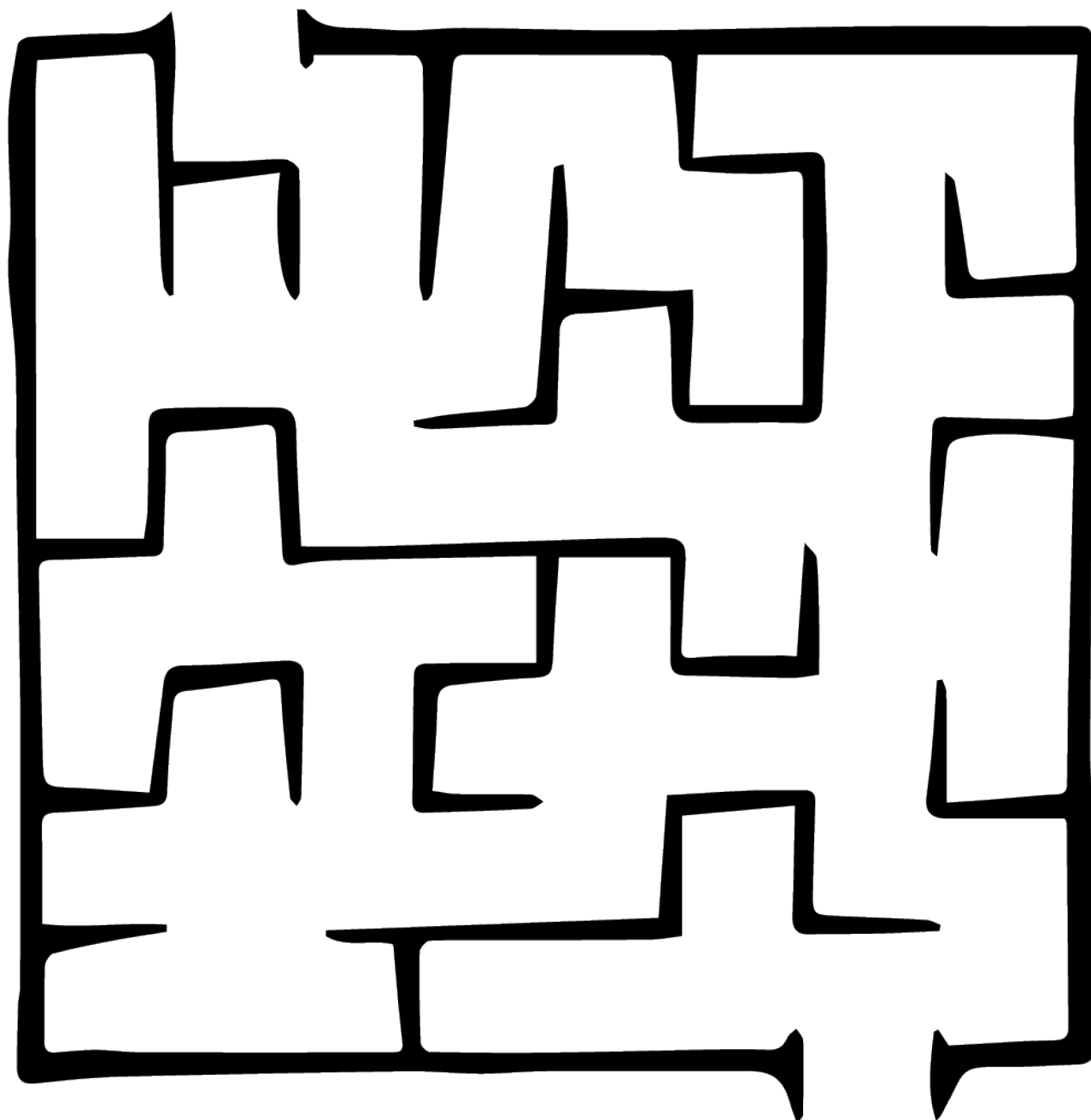
Close the meeting by singing Make New Friends and doing a friendship circle.

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 laboratory, factory, or plant to your meeting to talk about what they do.



Start



End

