

Board Game Design Challenge 1

Overview

In the Board Game Design Challenge, Daisies create board games and learn that people who invent new things are called inventors.

Step One: Come up with an idea for your board game.

Step Two: Design a spinner for your game.

Step Three: Test your game and make it better. *(To be completed in Board Game Design Challenge 2.)*

This meeting, Daisies brainstorm ideas for board games and design their spinner. Daisies complete Step One and Step Two of the Board Game Design Challenge badge.

Note to Volunteers:

Use the Talking Points (But Make Them Your Own): In each session, you'll find suggested talking points under the heading "SAY." Some volunteers, especially new ones, find it helpful to follow the script. Others use the talking points as a guide and deliver the information in their own words. Either way is just fine.

Be Prepared (It's What Girl Scouts Do!): Each meeting includes a "Prepare Ahead" section that includes a materials list and what kind of set-up is required. Read it in advance so you have enough time to gather supplies and enlist help, if needed.

If your troop has the GoldieBlox Making Things Move kit, you can find a set of Activity Instructions for the badge in the Meeting Aids section of this badge meeting under "Activities for the Making Things Move Kit."

Use Girl Scouts' Three Processes: Girl-led, learning by doing, cooperative learning—these three processes are the key to making sure Daisies have fun in Girl Scouts and keep coming back.

"Learning by doing" and "cooperative learning" are built into this Badge, thanks to the hands-on activities and tips. You'll also find specific "keep it girl-led" tips in the meeting plans. They'll help you create an experience where Daisies know they can make choices and have their voices heard.

Fail Fast. Succeed Sooner: That's how engineers solve problems. In this badge, Daisies will learn about engineering through hands-on activities. They'll learn to: Brainstorm ways to solve a problem, design prototypes, test them to see what does and doesn't work, then improve their designs. To engineers, failure is a good thing because every time a design fails, you learn something and can make it better.

You can help Daisies think this way. When her prototype doesn't work, ask questions like, "Why do you think it didn't work? How can you change your design? Try again—that's what engineers do!" This approach also keeps the activity girl-led and fun because Daisies are free to invent things without feeling the pressure to make them perfect.

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Leave Time for the Closing Ceremony: If Daisies are having fun doing a Design Challenge, you may be tempted to skip the Closing Ceremony so they can keep going—but the Closing Ceremony is absolutely key to their learning. Here's why:

When Daisies leave a meeting, they'll remember how much fun it was to build a board game or to make a car speed down a ramp. However, they may not realize that they just learned how engineers solve problems or that they're good at engineering—unless you tell them.

That's why the Closing Ceremony is so important. It's where you can connect the dots for Daisies by:

- Pointing out how they acted as engineers. (**For example:** They did rapid prototyping. When one of their prototypes didn't work, they saw that "failure" as helpful feedback and tried something else. They worked together to find solutions. They shared their designs and offered suggestions.)
- Reminding Daisies that they are *already* engineers—and that it's fun to solve problems using engineering.
- Letting them know that they have what it takes to continue exploring STEM.

These simple messages can boost Daisies' confidence and interest in STEM—and end the meeting on an upbeat note!

Tell Your Troop Story: As a Girl Scout leader, you're designing experiences that Daisies will remember their whole lives. Try to capture those memories with photos or videos. Daisies love remembering all they did—and it's a great way for parents to see how Girl Scouting helps their Daisies!

And please do share your photos and videos with GSUSA by emailing them to STEM@girlscouts.org (with photo releases if at all possible!).

Prepare Ahead (Roughly 50 minutes)

1. Go over new words Daisies can learn (2 minutes)

This meeting includes the following words Daisies may not know:

- **Inventors** – People who think of and build new products and ideas.
- **Engineers** – People who like to know how things work. They design and build things people use every day, like computers, phones, roads, bridges, and cars.
- **Brainstorming** – When people come together to think of new ideas and solutions.
- **Features** – Parts of a product that are designed make them more useful. For example, windshield wipers or automatic door locks are features of a car.

See the **Glossary for Daisy Design Challenge Badges** for more vocabulary and examples.

Board Game Design Challenge 1

2. Read through this guide and handouts (15 minutes)

This will help you get familiar with the flow of the meeting.

The following handouts can be found in Meeting Aids.

- **Daisy Design Challenge Badges: Materials List:** Each meeting has its own materials list, but you can use this handout if you like to do all your supply shopping at one time. It includes the materials needed for all three Daisy Design Challenge badges.
- **Glossary for Daisy Design Challenge Badges:** This is a list of words that Daisies may not know and how to define them.
- **Think, Pair, Share:** These facilitation tips will help you to make sure that every girl's voice is heard during brainstorming activities.

3. Gather materials (30 minutes)

Gather materials using the Materials List for this meeting. If your meeting location doesn't have a flag, bring a small one that Daisies can take turns holding or hang in the room.

Prior to the meeting, you may want to create a sample game spinner to show to girls. Alternatively, you can show them the Meeting Aid, **Sample Game Spinner**.

If your troop has the GoldieBlox Making Things Move kit, you can find a set of Activity Instructions for the badge in the Meeting Aids section of this badge meeting under "Activities for the Making Things Move Kit."

Get Help from Your Family and Friends Network

Your Friends and Family Network can include:

- Daisies' parents, aunts, uncles, older siblings, cousins, and friends
- Other volunteers who have offered to help with the meeting

Ask your Network to help:

- Bring materials
- Assist with Design Challenge activities

Award Connection

Daisies will earn one award:

- Board Game Design Challenge badge

Daisies receive the award following the completion of all three steps of the badge in **Board Game Design Challenge 2**.

(Note to Volunteers: You can buy these awards from your council shop or on the Girl Scouts' website.)

Board Game Design Challenge 1

Meeting Length

60 minutes

- The times given for each activity will be different depending on how many Daisies are in your troop.
- There is no snack time scheduled in these meetings. If girls need a snack, add 15 minutes to the overall time for the meeting.
- Give Daisies 10- and 5-minute warnings before they need to wrap up the last activity so you'll have time for the Closing Ceremony.

Materials List

Activity 1: As Girls Arrive: Paper Games

- Paper
- Pencils
- Optional: Find and print out puzzles, mazes, and other simple paper games

Activity 2: Opening Ceremony: All About Games

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Come Up with an Idea for Your Board Game

- Paper
- Markers and/or crayons

Activity 4: Design a Spinner for Your Game

For each spinner:

- 1 spool. Alternatively, you could use washers or other small items with a hole in the middle. (**Note to Volunteers:** Girls will need at least one item for the spinner, but a variety of options gives girls the opportunity to engineer different and original solutions.)
- 1 wooden dowel. Alternatively, you could use straws, pencils, or BBQ skewers. (**Note to Volunteers:** Make sure it fits through the spool or other item with a hole.)
- 4 popsicle sticks
- Clay or poster putty
- Tape (masking or duct)
- Small piece of cardboard to attach as the base of the spinner

Activity 5: Closing Ceremony: Flash Chat

- **Spinner Paper Pieces** (one for each Spinner created)

Awards

Girls do not receive any awards in this meeting.

Board Game Design Challenge 1

Detailed Activity Plan

Activity 1: As Girls Arrive: Paper Games (10 minutes)

Materials

- Paper
- Pencils
- Optional: Find and print out puzzles, mazes and other simple paper games

Steps

Welcome Daisies and have them play common paper games in pairs. This could include: Tic Tac Toe, Dots and Boxes (girls take turns forming lines to create boxes on a dotted grid), Pictionary, or any other games you know.

Optional: Hand out puzzles, mazes, or other paper games for Daisies.

SAY:

Today, we're going to start designing our own board games.

To get ready, play your favorite paper games with your partner!

Maybe you like Tic Tac Toe or perhaps you like Pictionary?

Activity 2: Opening Ceremony: All About Games (10 minutes)

Materials

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Steps

Recite the Pledge of Allegiance and the Promise and Law.

Conduct any troop business.

Introduce Daisies to the Board Game Design Challenge.

SAY:

Today, we're starting the Board Game Design Challenge badge!

You're going to learn how to invent new board games and create things like an engineer.

Engineers are people who like to know how things work. They design and build things people use every day, like computers, phones, roads, bridges, and cars.

Board Game Design Challenge 1

Engineers use their imaginations to solve problems and create new products. You'll do the same thing today!

Activity 3: Come Up with an Idea for Your Board Game (15 minutes)

Materials

- Paper
- Markers and/or crayons

Steps

Daisies learn about inventors and brainstorm their own board games for Step One of the Board Game Design Challenge.

SAY:

Who can name a board game you love to play?

Girls may say: Chutes and Ladders, Peaceable Kingdom games, Candyland, etc. (Let girls name their favorite games, even though not all of them involve spinners.)

If you were making up a new game, what would it be like?

Let girls toss out ideas for new board games.

If they need help getting started, ask questions such as:

- *Would you have characters in your game?*
- *What would they be trying to do?* **Girls may say:** Get to the enchanted forest, get to the end of the road first, collect the most of some object, etc.
- *What would the name of your game be?*
- *Does someone win the game? What do they have to do to win?*

SAY:

Those sound like fun games. Some inventors make up new games!

People who make up new things are called inventors. They often brainstorm many ideas at first then draw their ideas so they can show them to others.

Has anyone ever heard of brainstorming? What is it? (Answer: Brainstorming is when people come together to think of new ideas and solutions.)

You are all inventors, so why don't we take a few minutes for you to brainstorm and draw your board game ideas?

Hand out paper and crayons/markers.

Board Game Design Challenge 1

Give girls 10 minutes to draw their game ideas.

They may want to work alone or in pairs.

Activity 4: Design a Spinner for Your Game (15 minutes)

Materials

For each spinner:

- 1 spool. Alternatively, you could use washers or other small items with a hole in the middle. (**Note to Volunteers:** Girls will need at least one item for the spinner, but a variety of options gives girls the opportunity to engineer different and original solutions.)
- 1 wooden dowel. Alternatively, you could use straws, pencils, or BBQ skewers. (**Note to Volunteers:** Make sure it fits through the spool or other item with a hole.)
- 4 popsicle sticks
- Clay or poster putty
- Tape (masking or duct)
- Small piece of cardboard to attach as the base of the spinner

Steps

Daisies brainstorm and build spinners for Step Two of the Board Game Design Challenge.

SAY:

In a lot of games, you figure out how many moves you can make by using dice. We don't have any dice. What else could we use? (Answer: A spinner.)

Do you have a favorite game that uses a spinner? How does it work?

Engineers are inventors who know how to design and build all kinds of things. One of the things they might want to design is a game spinner.

Do you think you could design something that would work the same way? What materials could you use? What would it need to do? (Answer: Spin and point.)

Show girls the **Sample Game Spinner** or the sample you created.

SAY:

Here's a sample spinner for a board game, but you can do it any way you like. What are some other ways you could use the materials to make a spinner for your board game?

In pairs (or small teams), work together to create a spinner that can turn in a circle and point to something, just like this spinner.

See what you can put together. Take turns trying to make your design better. Engineers always try more than one idea.

Board Game Design Challenge 1

Divide girls into pairs or small teams.

Keep It Girl-Led: Girls may want to work in pairs or small design teams for the activity. Each group will need a full set of supplies, so help the girls to form their teams depending on the amount of materials available.

Give each team materials to build their spinner.

Float around the room, watching girls try out different designs. If they are having problems, avoid offering them a solution. Instead, ask questions, such as, “Why do you think your spinner isn’t working yet? What else could you try?”

Keep It Girl-Led: By having girls reverse engineer a spinner, Daisies have a hands-on opportunity to create their own solution instead of following directions. If they’re having trouble, ask them questions like, “What materials could you put together to turn in a circle? How could you connect them? What material would help the spinner to point?”

Circulate among the groups, asking questions to prompt further exploration.

If girls are having trouble, lead them to use the cardboard to create a base. Attach the dowel to the base and attach one or more craft sticks to the spool. Place the spool over the dowel.

Remind Daisies that their spinner needs to turn and point.

Activity 5: Closing Ceremony: Flash Chat (10 minutes)

Materials

- **Spinner Paper Pieces** (one for each Spinner created)

Steps

Have Daisies form a Friendship Circle and discuss with them how they designed their spinners.

SAY:

Different designs do different things. Good designs offer “features” that make them more useful. For example, a feature could be something like a sharp point that helps the spinner move faster.

How will you use the spinner in your game? (Answer: The spinner can tell us where or how far to move.)

What materials did you use? Why did you choose those?

Board Game Design Challenge 1

What features does your spinner design include?

If we built a spinner with all the features we just came up with, how would we build it?

How could we decide between two conflicting features? (Answer: Whichever is most useful.)

How would we define “the best spinner”? (Answers may vary. The one that is easiest to spin and spins the longest may be one answer.)

Show Daisies the **Spinner Paper Pieces**.

SAY:

Is there a design feature that works best to attach these to our spinners? How could we include these? (Answer: Put over the dowel, between the base of the spinner and the spool.)

Next time, we’ll add these paper pieces on to our spinners before we create and play our board games!

End the meeting with a Friendship Squeeze.

(Note to Volunteers: If you can, save the Daisies’ spinners for the next meeting, Board Game Design Challenge 2. Label each spinner with the girl or group’s name(s) and put away until the next meeting. If you are unable to keep them, don’t worry, the girls will have a chance to rebuild at the start of the next meeting, though this may take longer than the allotted time given.)

Daisy Design Challenge Badges (DIY Activity Version)

Daisy Design Challenge Badges: Materials List**Board Game Design Challenge 1****Activity 1: As Girls Arrive: Paper Games**

- Paper
- Pencils
- Optional: Find and print out puzzles, mazes and other simple paper games

Activity 2: Opening Ceremony: All About Games

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Come Up with an Idea for Your Board Game

- Paper
- Markers and/or crayons

Activity 4: Design a Spinner for Your Game

For each spinner:

- 1 spool. Alternatively, you could use washers, or other small items with a hole in the middle. **(Note to Volunteers:** Girls will need at least one item for the spinner, but a variety of options gives girls the opportunity to engineer different and original solutions.)
- 1 wooden dowel. Alternatively, you could use straws, pencils, or BBQ skewers. **(Note to Volunteers:** Make sure it fits through the spool or other item with a hole.)
- 4 popsicle sticks
- Clay or poster putty
- Tape (masking or duct)
- Small piece of cardboard to attach as the base of the spinner

Activity 5: Closing Ceremony: Flash Chat

- **Spinner Paper Pieces** (one for each Spinner created)

Board Game Design Challenge 2**Activity 1: As Girls Arrive: Create Your Game Board**

- Spinners created in Board Game Design Challenge **(Note to Volunteers:** If you were unable to save the spinner between meetings, Daisies can rebuild their spinners during this activity.)
- **Spinner Paper Pieces**, one for each Spinner created
- Large paper, construction paper, or poster board
- Markers and/or crayons
- **Optional:** Additional decorations for game boards, like stickers, construction paper, and tape/glue

Daisy Design Challenge Badges (DIY Activity Version)

Board Game Design Challenge 2 (continued)

Activity 2: Opening Ceremony: Share Your Board Game

- Flag
- Spinners and game boards created by Daisies
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Test Your Game and Make It Better

- Spinners and game boards created by Daisies
- Small toy figures for girls to use as game players, at least one for each girl
- **Optional:** Variety of additional supplies for girls to expand their game boards or improve their spinner, like spools, dowels, craft sticks, clay, and tape.

Activity 4: Closing Ceremony: Awards

- Board Game Design Challenge award, one for each girl

(Note to Volunteers: You can buy these awards from your council shop or the Girl Scouts' website.)

Roller Coaster Design Challenge 1

Activity 1: As Girls Arrive: How Does It Move?

- None

Activity 2: Opening Ceremony: All About Roller Coasters

- Flag
- **Where Does the Roller Coaster Go Fastest?** handout
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Make a Simple Roller Coaster Car

- **Sample Roller Coaster Car**, handout
- Optional: sample roller coaster car made by you

For each roller coaster car, girls will need at least:

- 2 spools
- 2 dowels. Alternatively, you could use other craft sticks with dull ends, straws, BBQ skewers, etc.) (**Note to Volunteers:** Make sure the dowels fit in spools.)
- 2 craft sticks
- Clay or poster putty
- Tape (masking or duct)
- Safety scissors
- **Note to Volunteers:** The sample roller coaster car uses two spools, two dowels, and two craft sticks, held together with clay and/or tape, but girls can build upon this with the other materials if you have them available. For example, they could experiment with adding a car to hold figurines using small boxes or paper cups.

Daisy Design Challenge Badges (DIY Activity Version)

Roller Coaster Design Challenge 1 (continued)

Activity 4: Build a Model of a Roller Coaster

- Roller coaster cars created by girls in Activity 3: Make a Simple Roller Coaster Car
- Folders, poster boards, cardboard, etc., to lean against something to create a ramp
- Books, boxes, tables, etc. to create the height and top of a ramp

Activity 5: Closing Ceremony: Flash Chat

- None

Roller Coaster Design Challenge 2

Activity 1: As Girls Arrive: Prepare for Testing

- Roller coaster cars created by girls in Roller Coaster Design Challenge 1. (**Note to Volunteers:** If you were unable to save the roller coaster cars between meetings, Daisies can rebuild their cars during this activity.)
- Folders, poster boards, cardboard, etc., to lean against something to create a ramp
- Books, boxes, tables, etc. to create the height and top of a ramp

Activity 2: Opening Ceremony: Engineers Work Together!

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Test Your Roller Coaster

- Roller coaster cars created by girls in Roller Coaster Design Challenge 1 or rebuilt in Activity 1: As Girls Arrive: Prepare for Testing
- Ramps created in Activity 1: As Girls Arrive: Prepare for Testing
- Leftover materials from Activity 1: As Girls Arrive: Prepare for Testing for girls to build on ramps
- Leftover or additional materials for girls to build upon their roller coaster cars

Activity 4: Closing Ceremony: Awards

- Roller Coaster Design Challenge award, one for each girl

(Note to Volunteers: You can buy these awards from your council shop or the Girl Scouts' website.)

Model Car Design Challenge 1

Activity 1: As Girls Arrive: Playing with Force and Friction

- Sports and game balls (one for each pair of girls). Bring different types of balls for girls to roll and observe friction. For example, you might bring a marble, tennis ball, basketball, ping pong ball, baseball, etc.
- Create two lines with masking tape on the floor. Each Daisy should sit on the line, facing their partner.

Daisy Design Challenge Badges (DIY Activity Version)

Model Car Design Challenge 1 (continued)

Activity 2: Opening Ceremony: All About Friction

- Flag
- Optional: Print out pictures of a bicycle wheel (including brake pads), a golf ball on a putting green, a baseball player sliding, and a sled loaded with supplies (or other examples of friction).
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Design and Build Model Cars

- Blank paper
- Crayons or markers
- **Sample Model Car** handout, for your reference
- Optional: Create a sample model car for girls to reverse engineer.

Suggested materials for each model car:

- 2 or 4 (depending on length and size of cabin) wooden dowels or other material to attach wheels to car cabin. Alternatively, you could bring straws, BBQ skewers, etc. (**Note to Volunteers:** Make sure the dowels or other wheel attachments fit in the wheels and allow wheel rotation.)
- 4 wooden wheels. Alternatively, you could bring round soda caps, cds, or other round materials for girls to test.
- Clay, foam, or poster putty
- Tape
- Small and medium boxes (assorted sizes.) A variety of boxes give girls the opportunity to try different materials for their car.
- Optional: Other materials for girls to use in their model car, such as paper towels, pieces of cardboard, cups, etc.
- **Note to Volunteers:** Depending on what you have available, Daisies can experiment using the different materials to create their model car.

Activity 4: Use Model Cars to Test the Friction of Different Surfaces

- Model cars created in Activity 3: Design and Build Model Cars
- 2+ Friction stations for girls to test their cars (including a different surface at each station). See Prepare Ahead for more information on how to create the stations.
- Optional: Yard sticks, rulers, or string for Daisies to measure how far their cars go at each station.
- Optional: Paper and pencils if Daisies can read/write to record data.

Activity 5: Closing Ceremony: Reviewing Our Testing Results

- None

Daisy Design Challenge Badges (DIY Activity Version)

Model Car Design Challenge 2

Activity 1: As Girls Arrive: Build A Simple Ramp

- Model cars created by girls in Model Car Design Challenge 1. (**Note to Volunteers:** If you were unable to save the model cars between meetings, Daisies can rebuild their cars during this activity.)
- Folders, poster boards, cardboard, etc., to lean against something to create a ramp
- Books, boxes, tables, etc. to create the height and top of a ramp

Activity 2: Opening Ceremony: Reviewing Force and Friction

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Activity 3: Race Your Cars!

- Model cars created by girls in Model Car Design Challenge 1 or rebuilt in Activity 1: As Girls Arrive: Build a Simple Ramp
- Sample ramp or ramps created in Activity 1: As Girls Arrive: Build a Simple Ramp
- Tape
- Toy figurine, at least one for each Model Car
- Leftover or additional materials for girls to rebuild their model cars. You may want to bring dowels, wheels, boxes, cups, cardboard, paper tubes, clay or poster putty, tape, etc.
- Surface for bottom of ramp (towel, carpet, or asphalt)

Activity 4: Closing Ceremony: Awards

- Model Car Design Challenge award, one for each girl

(Note to Volunteers: You can buy these awards from your council shop or the Girl Scouts' website.)

Design Challenge Badges

Glossary for Daisies

Daisies may not know some of the words used in these badges. Here are definitions you can share with them:

Inventors are people who think of and build new products and ideas.

Engineers are people who like to know how things work. They design and build things people use every day, like computers, phones, roads, bridges and cars.

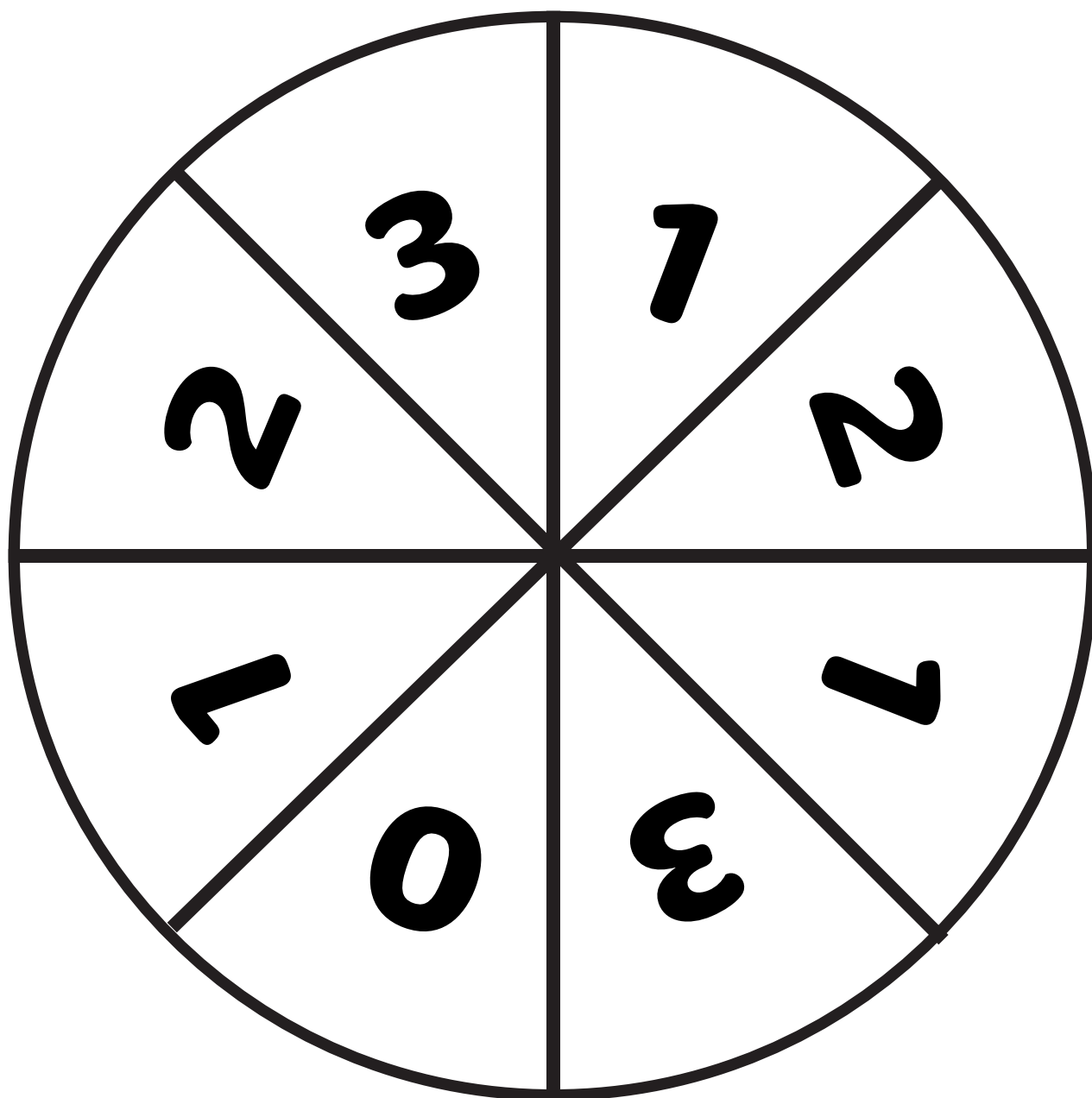
Brainstorming is what happens when you and your troop get together to come up with ideas.

Features are parts of a product that are designed make them more useful. For example, windshield wipers or automatic door locks are features of a car.

Force is the strength or energy that creates movement. Push and pull are examples of force.

Friction is a force that slows moving objects.

Spinner Paper Pieces for Board Game Design Challenge



Brainstorming Tips: Think, Pair, Share

How to Run a Think, Pair, Share Activity:

Tell girls that they're going to brainstorm answers to your question using "Think, Pair, Share."

Lead girls through the basic steps by telling them they will:

1. Break into small groups.

2. Listen to the question or prompt.

3. Think about their answers.

- Girls may want to write their answers down.
- Twenty seconds should be enough time, since girls will need to sit quietly.

4. Pair with other girls.

- Girls talk with one to three other girls (depending on group size), making sure everyone has a chance to share their answers. If there's time, it's OK for girls to ask questions about each other's answers.
- For pairs, 20 seconds should be enough time. If your troop enjoys discussion, consider extending this to 1 to 2 minutes.

5. Share with the group.

- Girls share their answers with the larger group.
- This can be completed in 20 – 30 seconds, but will run longer based on group size and how the group sharing is done.

There are two ways to set up group sharing:

- **Strongly Recommended:** One girl shares the best/most interesting/summary answer for the group. This approach is great if you're running short on time. It also helps develop conflict resolution and compromise skills.
- **Optional:** Each girl shares her partner's answer. This helps girls develop active listening skills, but will run longer because all girls are sharing.

The Girl Scout Promise

On my honor, I will try:

**To serve God and my country,
To help people at all times,
And to live by the Girl Scout Law.**

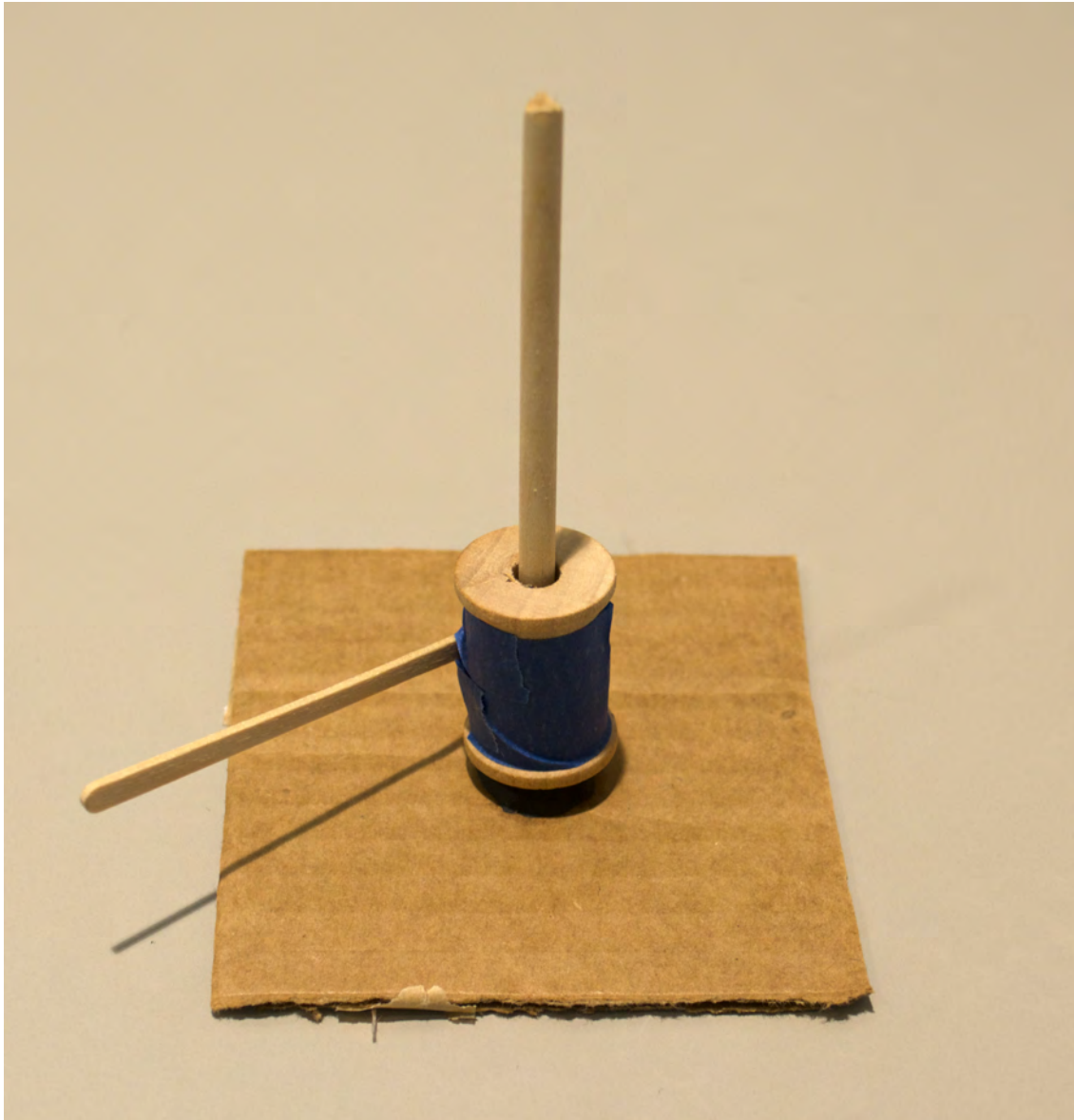
The Girl Scout Law

I will do my best to be

**honest and fair,
friendly and helpful,
considerate and caring,
courageous and strong, and
responsible for what I say and do,
and to
respect myself and others,
respect authority,
use resources wisely,
make the world a better place, and
be a sister to every Girl Scout.**

Board Game Design Challenge

Sample Game Spinner



This spinner is made from: 1 square of cardboard, 1 spool, 1 craft stick, 1 dowel, clay, tape.

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Board Game Design Challenge 1 (Version for the Making Things Move Kit)

Note to Volunteers on the GoldieBlox Making Things Move kit:

This version of the badge uses the GoldieBlox Making Things Move kit. Each kit includes 6 sets of GoldieBlox parts for the badge, (i.e. you can create 6 of any Daisy Design Challenge badge from one kit). Inside the kit are six sets of GoldieBlox parts that allow girls to earn all 3 Daisy Design Challenge badges. Two to four girls can use each set. So, if you have 12 girls, you will need one kit for them to work in pairs.

The kit is no longer available to purchase, but you can find a full parts list at the end of this handout if you want to pull together the GoldieBlox for the badges. If you do not have the GoldieBlox, we recommend completing the badge using the DIY instructions now included as the Meeting Plan on VTK.

Materials List

As Girls Arrive: Paper Games

- Paper
- Pencils
- Optional: Find and print out puzzles, mazes and other simple paper games

Opening Ceremony: All About Games

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Step One: Come Up with an Idea for Your Board Game

- Paper
- Markers and/or crayons

Step Two: Design a Spinner for Your Game

- GoldieBlox Making Things Move kit (one set for each pair or small team.) Feel free to add additional pieces from personal GoldieBlox kits that you or your Girl Scouts may own.

Closing Ceremony: Flash Chat

- **Spinner Paper Pieces** (one for each Spinner created)

Awards

Girls do not receive any awards in this meeting.

Board Game Design Challenge 1 (Version for the Making Things Move Kit)

Detailed Activity Plan

As Girls Arrive: Paper Games (10 minutes)

Materials

- Paper
- Pencils
- Optional: Find and print out puzzles, mazes and other simple paper games

Steps

Welcome Daisies, and have them play common paper games in pairs. This could include: Tic Tac Toe, Dots and Boxes (girls take turns forming lines to create boxes on a dotted grid), Pictionary, or any other games you know.

Optional: Hand out puzzles, mazes or other paper games for Daisies.

SAY:

- *Today, we're going to start designing our own board games.*
- *To get ready, play your favorite paper games with your partner!*
- *Maybe you like Tic Tac Toe or perhaps you like Pictionary?*

Opening Ceremony: All About Games (10 minutes)

Materials

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Steps

Recite the Pledge of Allegiance and the Promise and Law.

Conduct any troop business.

Introduce Daisies to the Board Game Design Challenge.

SAY:

- *Today, we're starting the Board Game Design Challenge badge!*
- *You're going to learn how to invent new board games and create things like an engineer.*
- *Engineers are people who like to know how things work. They design and build things people use every day, like computers, phones, roads, bridges and cars.*
- *Engineers use their imaginations to solve problems and create new products. You'll do the same thing today!*

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Board Game Design Challenge 1 (Version for the Making Things Move Kit)

Step One: Come Up with an Idea for Your Board Game (15 minutes)

Materials

- Paper
- Markers and/or crayons

Steps

Daisies learn about inventors and brainstorm their own board games for Step One of the Board Game Design Challenge.

SAY:

- *Who can name a board game you love to play?*
Girls may say: Chutes and Ladders, Peaceable Kingdom games, Candyland, etc. (Let girls name their favorite games, even though not all of them involve spinners.)
- *If you were making up a new game, what would it be like?*

Let girls toss out ideas for new board games.

If they need help getting started, ask questions such as:

- *Would you have characters in your game?*
- *What would they be trying to do?* **Girls may say:** Get to the enchanted forest, get to the end of the road first, collect the most of some object, etc.
- *What would the name of your game be?*
- *Does someone win the game? What do they have to do to win?*

SAY:

- *Those sound like fun games. Some inventors make up new games!*
- *People who make up new things are called inventors. They often brainstorm many ideas at first then draw their ideas so they can show them to others.*
- *Has anyone ever heard of brainstorming? What is it?* **(Answer: Brainstorming is when people come together to think of new ideas and solutions.)**
- *You are all inventors, so why don't we take a few minutes for you to brainstorm and draw your board game ideas?*

Hand out paper and crayons/markers.

Give girls 10 minutes to draw their game ideas.

They may want to work alone or in pairs.

Board Game Design Challenge 1 (Version for the Making Things Move Kit)

Step Two: Design a Spinner for Your Game (15 minutes)

Materials

- GoldieBlox Making Things Move kit (one set for each pair or small team.) Feel free to add additional pieces from personal GoldieBlox kits that you or your Girl Scouts may own.

Steps

Daisies brainstorm and build spinners for Step Two of the Board Game Design Challenge.

SAY:

- *In a lot of games, you figure out how many moves you can make by using dice. We don't have any dice. What else could we use? (Answer: A spinner.)*
- *Do you have a favorite game that uses a spinner? How does it work?*
- *Engineers are inventors who know how to design and build all kinds of things. One of the things they might want to design is a game spinner.*
- *Do you think you could design something with pieces from the kit that would work the same way? What would it need to do? (Answer: Spin and point.)*
- *In pairs (or small teams), work together to create a spinner that can turn in a circle and point to something, just like a spinner.*
- *See what you can put together. Take turns trying to make your design better. Engineers always try more than one idea.*

Divide girls into pairs or small teams.

Give each team a set from the GoldieBlox Making Things Move kit to build their spinner.

Float around the room, watching girls try out different designs. If they are having problems, avoid offering them a solution. Instead, ask questions, such as, "Why do you think your spinner isn't working yet? What else could you try?"

Keep It Girl-Led: By having girls reverse engineer the spinner, Daisies have a hands-on opportunity to learn about the different parts instead of following directions. If they're having trouble, ask them questions like, "What GoldieBlox parts could turn in a circle? How are they stuck together? What part would help the spinner to point?"

Circulate among the groups, asking questions to prompt further exploration.

If girls are having trouble, lead them to use the wheel parts to create a base. Axles can be added to help the spinner point.

Remind Daisies that their spinner needs to turn and point.

Board Game Design Challenge 1 (Version for the Making Things Move Kit)

Closing Ceremony: Flash Chat (10 minutes)

Materials

- **Spinner Paper Pieces** (one for each Spinner created)

Steps

Have Daisies form a Friendship Circle, and discuss with them how they designed their spinners.

SAY:

- *Different designs do different things. Good designs offer “features” that make them more useful. For example, a feature could be something like a sharp point that helps the spinner move faster.*
- *How will you use the spinner in your game? (**Answer: The spinner can tell us where or how far to move.**)*
- *What features does your spinner design include?*
- *What pieces did you start with? Why did you choose those? (**Note to Volunteers:** They may have started with a wheel and axle because they knew they would need them to spin.)*
- *What other pieces did you add? What about them made you use them? (**Note to Volunteers:** They may have used an axle or the crank to point or a washer to make it spin faster.)*
- *If we built a spinner with all the features we just came up with, how would we build it?*
- *How could we decide between two conflicting features? (**Answer: Whichever is most useful.**)*
- *How would we define “the best spinner”? (**Answers may vary. The one that is easiest to spin and spins the longest may be one answer.**)*

Show Daisies the **Spinner Paper Pieces**.

SAY:

- *Is there a design feature that works best to attach these to our spinners? What part could we use? (**Answer: Washers**)*
- *How do the washers help it spin faster? (**Answer: They are smoother than the pegboard or paper, so the wheel doesn’t get stuck on them.**)*
- *Next time, we’ll add these paper pieces on to our spinners before we create and play our board games!*

End the meeting with a Friendship Squeeze.

(Note to Volunteers: You may want to save the Daisies’ spinners for the next meeting, Board Game Design Challenge 2. If you are able to, label each spinner with the girl or group’s name(s) and put away until the next meeting. If you are unable to keep them together, don’t worry, the girls will have a chance to rebuild at the start of the next meeting.)

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Board Game Design Challenge 1 (Version for the Making Things Move Kit)

GoldieBlox Making Things Move kit – Parts Breakdown

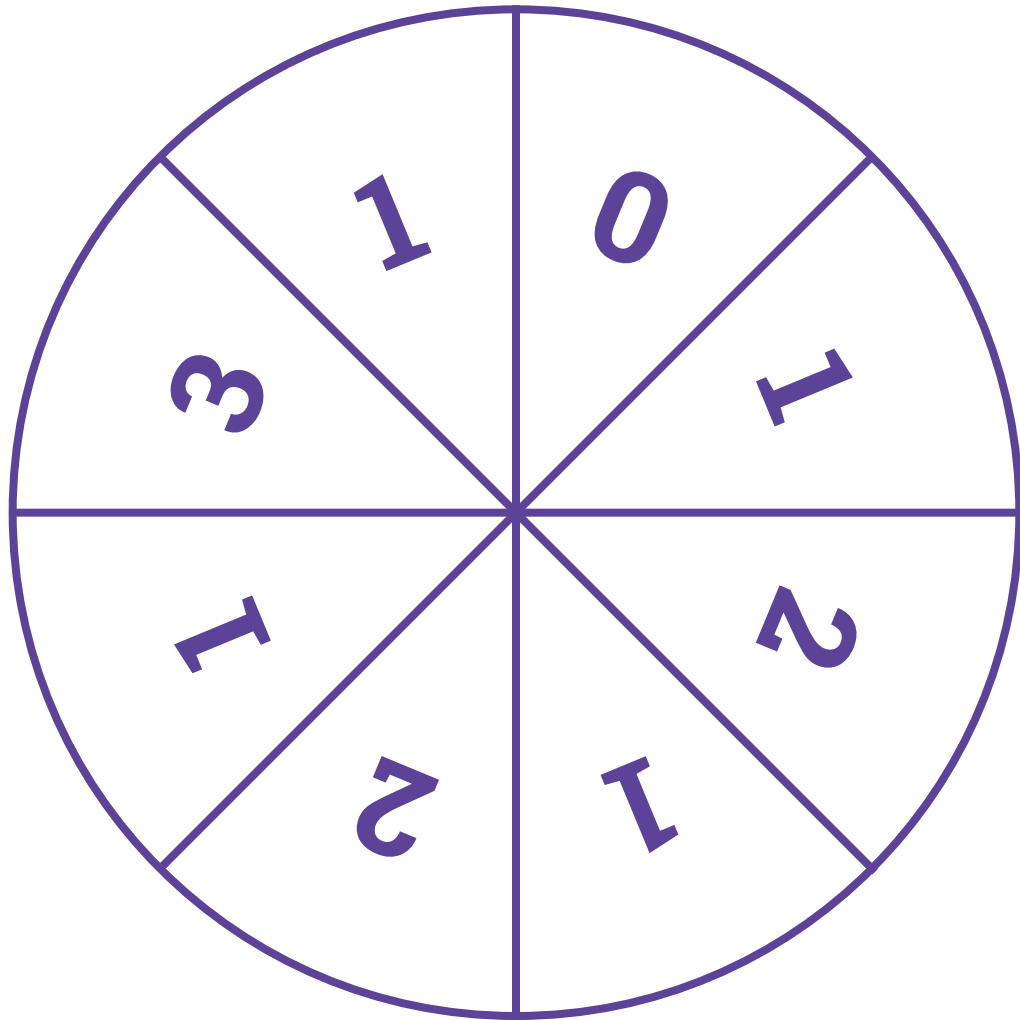
GoldieBlox	# in set	# in kit (6 sets)
Wheel	7	42
Blox (18 mm) 2.0	6	36
Short Axle	9	54
Long Axle	4	24
Spacer	4	24
Teal Ribbon	1	6
Elastic Band	1	6
Character – Nacho	1	6
Character – Flavio	1	6
Character – Katinka	1	6
Book – GoldieBlox and the Parade Float	1	6
Small Wheel Hub	4	24
Small Wheel End	8	48
Big Wheel End	2	12
Washer	8	48
Spacer	4	24
Tire	4	24

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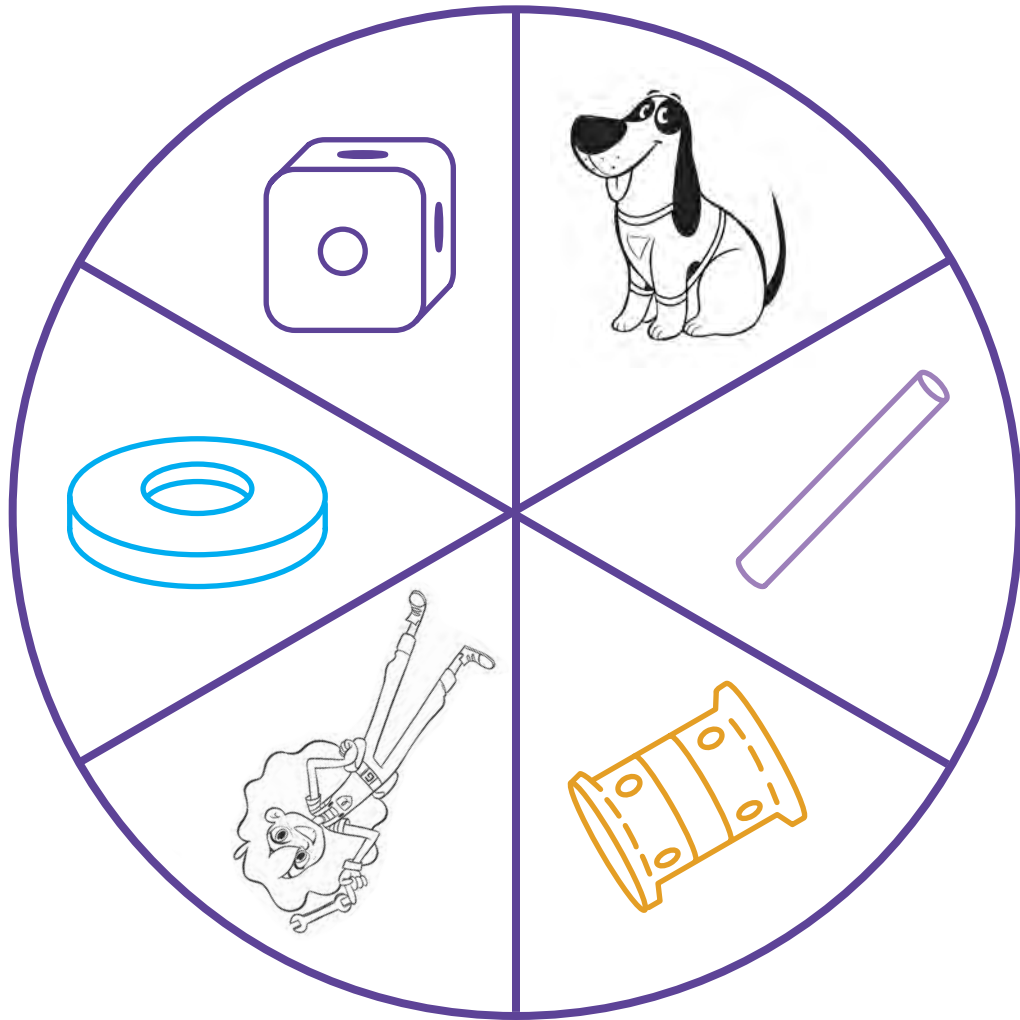
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NAME _____



NAME _____



Daisy Design Challenge Badges: Materials List

Board Game Design Challenge 1

As Girls Arrive: Paper Games

- Paper
- Pencils
- Optional: Find and print out puzzles, mazes and other simple paper games

Opening Ceremony: All About Games

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Step One: Come Up with an Idea for Your Board Game

- Paper
- Markers and/or crayons

Step Two: Design a Spinner for Your Game

- GoldieBlox Making Things Move kit (one set for each pair or small team.) Feel free to add additional pieces from personal GoldieBlox kits that you or your Girl Scouts may own.

Closing Ceremony

- **Spinner Paper Pieces** (one for each Spinner created)

Board Game Design Challenge 2

As Girls Arrive: Create Your Game Board

- Spinners created in Board Game Design Challenge 1. (**Note to Volunteers:** If you were unable to save the spinner between meetings, Daisies can rebuild their spinners during this activity.)
- **Spinner Paper Pieces** (one for each Spinner created)
- Large paper, construction paper, or poster board
- Markers and/or crayons

Opening Ceremony: Share Your Game Board

- Flag
- Spinners and game boards created by Daisies
- Optional: Poster Board with the Girl Scout Promise and Law

Step Three: Test Your Game and Make It Better

- Spinners and game boards created by Daisies
- GoldieBlox Making Things Move kit (one set for each pair or small team)

Closing Ceremony: Awards

- Board Game Design Challenge award, one for each girl

(**Note to Volunteers:** You can buy these awards from your council shop or on the Girl Scouts' website.)

Daisy Design Challenge Badges: Materials List

Roller Coaster Design Challenge 1

Opening Ceremony: All About Roller Coasters

- Flag
- **Where Does the Roller Coaster Go Fastest?** handout
- Optional: Poster Board with the Girl Scout Promise and Law

Step One: Make a Simple Roller Coaster Car

- GoldieBlox Making Things Move kit (one set for each pair or small team.) (**Note to Volunteers:** A simple roller coaster car uses 2 wheels, 4 blocks, and 4 short axles, but girls can build upon this with the other pieces. Feel free to add additional pieces from personal GoldieBlox kits that you or your Girl Scouts may own.)
- **Simple Roller Coaster Car** handout

Step Two: Build a Model of a Roller Coaster

- Roller coaster cars created by girls in Step One: Make a simple roller coaster car
- Folders, poster boards, cardboard, etc., to lean against something to create a ramp
- Books, boxes, tables, etc. to create the height and top of a ramp

Roller Coaster Design Challenge 2

As Girls Arrive: Prepare for Testing

- Roller coaster cars created by girls in Roller Coaster Design Challenge 1. (**Note to Volunteers:** If you were unable to save the roller coaster cars between meetings, Daisies can rebuild their cars during this activity.)
- Folders, poster boards, cardboard, etc., to lean against something to create a ramp
- Books, boxes, tables, etc. to create the height and top of a ramp

Opening Ceremony: Engineers Work Together!

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Step Three: Test Your Roller Coaster

- Roller coaster cars created by girls in Roller Coaster Design Challenge 1 or rebuilt in As Girls Arrive: Prepare for Testing
- Ramps created in As Girls Arrive: Prepare for Testing
- Leftover materials from As Girls Arrive: Prepare for Testing for girls to build on ramps
- Leftover parts from the GoldieBlox Making Things Move kit for girls to build on their roller coaster cars

Closing Ceremony: Awards

- Roller Coaster Design Challenge award, one for each girl

(**Note to Volunteers:** You can buy these awards from your council shop or on the Girl Scouts' website.)

Daisy Design Challenge Badges: Materials List

Model Car Design Challenge 1

As Girls Arrive: Playing with Force and Friction

- Sports and game balls (one for each pair of girls). Bring different types of balls for girls to roll and observe friction. For example, you might bring a marble, tennis ball, basketball, ping pong ball, baseball, etc.
- Create two lines with masking tape on the floor. Each Daisy should sit on the line, facing their partner.

Opening Ceremony: All About Friction

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law
- Optional: Print out pictures of a bicycle wheel (including brake pads), a golf ball on a putting green, a baseball player sliding, and a sled loaded with supplies (or other examples of friction)

Step One: Design and Build Model Cars

- GoldieBlox Making Things Move kit (one set for each pair or small team.) (**Note to Volunteers:** Depending on what model car Daisies decide to build, pieces will vary. Feel free to add additional pieces from personal Goldieblox kits that you or your Girl Scouts may own.)
- “GoldieBlox and the Parade Float” or **GoldieBlox Parade Floats** handout

Step Two: Use Model Cars to Test the Friction of Different Surfaces

- Floats created in Step One: Design and Build Model Cars
- 2+ Friction stations for girls to test their cars (including a different surface at each station). See Prepare Ahead for more information on how to create the stations.
- Optional: Yard sticks, rulers, or string for Daisies to measure how far their cars go at each station.
- Optional: Paper and pencils if Daisies can read/write to record data.

Model Car Design Challenge 2

As Girls Arrive: Build a Simple Ramp

- Model cars created by girls in Model Car Design Challenge 1. (**Note to Volunteers:** If you were unable to save the model cars between meetings, Daisies can rebuild their cars during this activity.)
- Folders, poster boards, cardboard, etc., to lean against something to create a ramp
- Books, boxes, tables, etc. to create the height and top of a ramp

Opening Ceremony: Reviewing Force and Friction

- Flag
- Optional: Poster Board with the Girl Scout Promise and Law

Step Three: Race Your Cars!

- Model cars created by girls in Model Car Design Challenge 1 or rebuilt in As Girls Arrive: Build a Simple Ramp
- Sample ramp or ramps created in As Girls Arrive: Build a Simple Ramp
- Leftover parts from the GoldieBlox Making Things Move kit for girls to rebuild their model cars
- Surface for bottom of ramp (towel, carpet, or asphalt)

Daisy Design Challenge Badges: Materials List

Model Car Design Challenge 2 (continued)

Closing Ceremony: Awards

- Model Car Design Challenge award, one for each girl

(**Note to Volunteers:** You can buy these awards from your council shop or on the Girl Scouts' website.)