



Daisy AUTOMOTIVE ENGINEERING Badges

BADGE SERIES OVERVIEW:

In the Automotive Engineering badge series, Daisies discover how vehicles are designed, engineered, and manufactured.

Daisies explore how automotive designers imagine and make plans for a new vehicle. Then, they design their own, sketching and sculpting a model of a vehicle that can help others.

Daisies find out how automotive engineers turn ideas into real cars! Then, they build, test, and improve prototypes of their own cargo vehicles.

Daisies look at how automotive manufacturers build and test vehicles to make sure they're ready for the road. Then, they create their own assembly line to build a set of model vehicles.

NOTES TO VOLUNTEERS:

Follow the Badge Progression:

The Automotive Engineering badge series has been designed for girls to do each badge in order, building on what they've learned. For these badges, the order is:

- ❶ Automotive Design
- ❷ Automotive Engineering
- ❸ Automotive Manufacturing

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.

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

"Learning by doing" and "cooperative learning" are built into these badges thanks to the hands-on activities. Remember to keep the meetings girl-led so you can help create an experience where girls know they can make choices and have their voices heard.

Leave Time for the Closing Ceremony: If Daisies are having fun with an activity, 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 do an activity, but they may not realize what its relationship to cybersecurity was, unless you tell them.

Here's why: When girls leave a meeting, they'll remember how much fun it was to do an activity, but they may not realize its relationship to the automotive process. For example, they may not realize that they just learned how engineers test their products—unless you tell them. When you do that, you turn a hands-on activity into a minds-on activity.

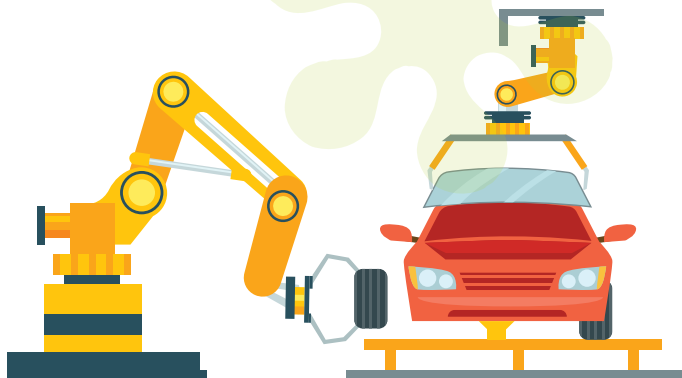
That's why the Closing Ceremony is so important. It's where you can connect the dots for Daisies by:

- Pointing out how they acted as automotive designers, engineers, or manufacturers. (For example: They created an assembly line to build a set of vehicles. They struggled a bit with a challenging activity—but they persisted. Now they know that they can solve hard problems if they keep trying.)
- Reminding girls that they are already automotive designers, engineers, or manufacturers—and that it's fun to solve problems using STEM!
- Letting them know that they have what it takes to continue exploring STEM.

These simple messages can boost girls' 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 for 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!).



To Prepare for the Meetings:

Before each meeting, you'll find an Overview, notes to Prepare Ahead, and a Materials List, all specific to that meeting.

Before each meeting, read through the meeting plan and any meeting aids. This will help you get familiar with the flow of each meeting.

Handouts specific to the meetings are listed in the Prepare Ahead section of each meeting under Meeting Aids. In addition, the following handouts are available in the Meeting Aids for every meeting:

- **Daisy Automotive Engineering Badges–Materials List:** Each meeting has its own materials list. However, if you like to do all your supply shopping at one time, use this handout. It includes the materials needed for all three Daisy badges.
- **Daisy Automotive Engineering Badges–Glossary:** This is a list of words introduced in the three Daisy Automotive Engineering badges with definitions.
- **Think, Pair, Share:** These facilitation tips will help you to make sure that every girl's voice is heard during brainstorming activities.

Go over words and careers girls can learn about. In the Prepare Ahead section for each meeting, you'll see a list of words and careers girls may or may not know and how to define them. You can find a full list of vocabulary and careers for the badge series in the **Daisy Automotive Engineering Badges–Glossary**.

Gather materials for the badge activities. Before each meeting, gather materials for the meeting's activities. Review the materials list to see what you already have or if there are items you can ask girls to bring. If your meeting location doesn't have a flag, bring a small one that you can take turns holding or hang in the room.

Each meeting includes its own materials list. However, if you like to do all your supply shopping at one time, use the **Daisy Automotive Engineering Badges–Materials List**. It includes the materials needed for all three Automotive Engineering badges.

Automotive Engineering

BADGE BREAKDOWN

AUTOMOTIVE DESIGN 1

1. **As Girls Arrive:** What Does a Specialized Vehicle Do?
2. **Opening Ceremony:** Get Moving with Automotive Design
3. **Step 1:** Choose Special Features for Your Vehicle
4. **Step 2:** Sketch Your Vehicle
5. **Closing Ceremony:** Transportation Around the World

- Daisies find out about transportation, mobility, and automotive design.
- They learn the parts of a vehicle and choose design criteria for a special purpose vehicle.
- They sketch the interior and exterior of their special purpose vehicles.
- They look at different types of transportation from around the world.

AUTOMOTIVE DESIGN 2

1. **As Girls Arrive:** Quick Design
2. **Opening Ceremony:** Needs and Wants in Automotive Design
3. **Step 3:** Sculpt and Share Your Vehicle
4. **Closing Ceremony:** Design the Future of Mobility & Awards

- Daisies finish designing their special purpose vehicles.
- They quickly sketch vehicles for a customer and brainstorm types of vehicles for the future.
- They explore how designers think about customer wants and needs.
- They sculpt their vehicles and share their designs with the troop.
- At the end of the meeting, they earn the Automotive Design badge.

AUTOMOTIVE ENGINEERING 1

1. **As Girls Arrive:** Moving Things from Place to Place
2. **Opening Ceremony:** Engineering for Good
3. **Step 1:** Create Your Automotive Engineering Plan
4. **Closing Ceremony:** Engineering for a Better World

- Daisies explore automotive engineering and cargo vehicles.
- They use a set of criteria to create an engineering plan to build a “shelter mobile” vehicle to help an animal shelter.
- They sketch their vehicle’s interior to meet the given criteria.
- They discuss how engineers solve problems and help people.

AUTOMOTIVE ENGINEERING 2

1. **As Girls Arrive:** Gather Your Vehicle Materials
2. **Opening Ceremony:** Explore the Design Thinking Process
3. **Step 2:** Build a Vehicle Prototype
4. **Step 3:** Test Your Vehicle Prototype
5. **Closing Ceremony:** Share Your Vehicle Prototype & Awards

- Daisies explore the importance of testing and iteration as they engineer a prototype of a sheltermobile.
- They build prototypes of their vehicles.
- They test their prototypes for forward motion and how well they carry cargo.
- They share their prototypes with the troop.
- At the end of the meeting, they earn the Automotive Engineering badge

AUTOMOTIVE MANUFACTURING 1

1. **As Girls Arrive:** Experiment with Die Presses
2. **Opening Ceremony:** Jump Into Manufacturing
3. **Step 1:** Explore Efficient Manufacturing and Assembly Lines
4. **Closing Ceremony:** Teamwork in Manufacturing

- Daisies discover how vehicles are efficiently manufactured.
- They experience and learn about die pressing.
- They see the difference between making items with and without a plan.
- They create their own manufacturing plan with an assembly line to produce a set of items.
- They discuss different kinds of teamwork in life and manufacturing.

AUTOMOTIVE MANUFACTURING 2

1. **As Girls Arrive:** Examine Your Vehicle Parts
2. **Opening Ceremony:** Match Your Parts and Materials
3. **Step 2:** Create an Assembly Line to Manufacture Vehicles
4. **Step 3:** Examine and Test Your Vehicles for Quality
5. **Closing Ceremony:** Brainstorm Process Improvements & Awards

- Daisies create a manufacturing plan to assemble a set of vehicles.
- They set up an efficient assembly line to build the vehicles.
- They check their vehicles for quality by testing to see if their vehicles roll in a straight line and that all the parts are attached securely.
- They discuss their testing results and brainstorm ways to improve their manufacturing process.
- At the end of the meeting, they earn the Automotive Manufacturing badge.

Badge Series and Meeting Length

- This series of badges has been designed to fit into six 60-minute troop meetings.
- There is no snack time scheduled in these meetings, but you can add 15 minutes of “wobble room” for snacks or activities that run long.
- The times given for each activity are recommended for troop meetings. However, before each meeting, review the amount of time given for each and decide if you think your troop will need more, less, or the same amount of time to complete them. Feel free to adjust the time for any of the activities as needed.
- Give girls 10- and 5-minute warnings before they need to wrap up the last activity so you'll have time for the Closing Ceremony.

Get Help from Your Family and Friends Network

Your Friends and Family Network can include:

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

Ask your Network to help:

- Bring materials or other supplies to the meeting.
- Assist with badge activities.
- Make snacks.

Award Connection

Girls earn three badges:

- Automotive Design
- Automotive Engineering
- Automotive Manufacturing

Note to Volunteers: You can buy the badges from your council shop or the [Girl Scout Shop](#).