

# 2017 New Brownie Badges and Journeys

## Engineering Badges (GoldieBlox partnership)

### Fling Flyer Design Challenge

Engineers use their imaginations to solve problems. They invent and build things. Work like an engineer to create a Fling Flyer, an airplane made with GoldieBlox, and explore what keeps it and other things, like birds, planes, and space ships, in the air.

1. Learn about forces that affect flight
2. Design and build a Fling Flyer
3. Test your Fling Flyer
4. Analyze and share your results
5. Brainstorm ways to improve your design

When I've earned this badge, I will have learned about the forces that affect flight as I design, build, and test a Fling Flyer. I will know how to design an investigation—and fine-tune my design after testing it, just like engineers.

### Leap Bot Design Challenge

Every day you see a problem an engineer has solved. They design bridges so your car can cross a river, planes so you can fly to another place, and really tall buildings for lots of people to work or live in. To solve problems and create products that work, engineers have to think about all of the different things that might affect their design. Design, build, and test things like an engineer as you create your own Leap Bot out of GoldieBlox.

1. Learn about springs
2. Build your Leap Bot
3. Create a way to test how well your Leap Bot performs
4. Record the results of your test
5. Share your results

When I've earned this badge, I will have learned about engineering, gravity, and force by building and testing a Leap Bot. I will know how to build and test a new product.

### Race Car Design Challenge

When engineers design something new, they need to consider how forces like gravity and friction will affect their design. Race car designers add or create special features, parts of something, that help their car to go fast. Engineers create these features to make their products more useful. Design, build, and test your own race car using GoldieBlox to explore how science can make a faster race car!

1. Learn how design can affect speed
2. Design and build your race car
3. Design your racetrack
4. Conduct a fair test and record results
5. Share what you learned

When I've earned this badge, I will have designed race cars and race tracks, then carried out "fair tests" to learn how design affects speed.

# Robotics Badges

## Programming Robots

Robots are simple machines made of many different parts that are programmed to run automatically. Programmers are the engineers that create step-by-step instructions, or algorithms, that tell robots how to understand and respond to their environment. Start by engineering a simple algorithm then learn about programming on paper, a “robot” Brownie friend, and on a device.

1. Create a simple machine
2. Test your robot senses
3. Learn about programming
4. Try simple programming
5. Code a robot

When I’ve earned this badge, I will know how robots use sensors and how to create simple programs that could be run by a robot.

## Designing Robots

Robot are simple machines that run automatically, made of many different parts, each with its own important job to help the robot. Sometimes, engineers design robots that look like or are inspired by humans, animals, and nature. Work in engineering teams with your fellow Brownies to design a robot inspired by a bumblebee, and build a robotic arm that helps others to extend their reach. After, it’s time to put it all together, and design your own robot that helps other people or animals! Test and share your robot prototype with other Brownies for ideas on how to make it even better.

1. Explore how robots imitate nature
2. Learn about the parts of a robot
3. Plan your robot
4. Create a prototype
5. Get feedback on your robot

When I’ve earned this badge, I will know how to plan, build, and share feedback like an engineer by creating a prototype of a robot that helps other people or animals.

## Showcasing Robots

After engineers build their robots, they show them to other engineers and enter them into challenges and competitions. Now that you have your robot prototype, it’s time to create a presentation and share your design with others. After, learn about robotics teams and competitions and see a robot in action!

1. Create a presentation to share how you designed your robot
2. Tell others how you designed your robot
3. Learn about robotics competitions
4. Learn about robotics teams
5. See robots in action

Note: Unlike the other Robotics badges, these Steps include options. You may be able to complete multiple steps, particularly for Step Three through Step Five, at once.

When I’ve earned this badge, I will have shared my prototype and design process with other. I will see a robot in action and learn about robotics teams and competitions.

## Outdoor Journey

1. First Aid Badge
2. Hiker Badge
3. Cabin Camper Badge
4. Take Action Project

## Engineering Journey

1. Think like an engineer
  - a. What is an Engineer?
  - b. Design Challenge: Helping Hand
  - c. How Much Water Do We Use?
  - d. Design Challenge: Water Collection Device
  - e. Get Ready for Pop Fly
  - f. Design Challenge: Pop Fly
2. Take Action Project

## Computer Science Journey

1. Think like a programmer
  - a. Morse Code Messages
  - b. Solving Problems
  - c. Paper Programming
  - d. Use Computational Thinking Everyday
  - e. Functional Suncatchers
  - f. Walk the Line
  - g. Personal Innovations
  - h. Videos
    - i. [code.org/girlscouts/GraphPaperProgramming/DemoVideo](https://code.org/girlscouts/GraphPaperProgramming/DemoVideo) (for leaders)
    - ii. [code.org/girlscouts/GraphPaperProgramming/OverviewVideo](https://code.org/girlscouts/GraphPaperProgramming/OverviewVideo)
    - iii. [code.org/girlscouts/GraphPaperProgramming/ActivityVideo](https://code.org/girlscouts/GraphPaperProgramming/ActivityVideo) (for girls)
    - iv. [code.org/girlscouts/RelayPaperProgramming/OverviewVideo](https://code.org/girlscouts/RelayPaperProgramming/OverviewVideo) (for leaders)
    - v. [code.org/girlscouts/RelayPaperProgramming/ActivityVideo](https://code.org/girlscouts/RelayPaperProgramming/ActivityVideo) (for girls)
    - vi. [code.org/girlscouts/FunctionalSuncatchers/DemoVideo](https://code.org/girlscouts/FunctionalSuncatchers/DemoVideo) (for Leaders)
    - vii. [code.org/girlscouts/FunctionalSuncatchers/OverviewVideo](https://code.org/girlscouts/FunctionalSuncatchers/OverviewVideo)
    - viii. <https://www.youtube.com/watch?v=d1MdyeXy0v0> (for girls)
    - ix. [code.org/girlscouts/PersonalInnovations/ActivityVideo](https://code.org/girlscouts/PersonalInnovations/ActivityVideo) (Computer Science is changing everything video)
2. Take Action Project

**Outdoor STEM Journey** <https://scistarter.com/girlscouts/volunteer/landing> for videos

1. Think Like a citizen scientist
  - a. Becoming Citizen Scientists (using Scistarter videos)
  - b. Sharpen Observation Skills
  - c. Choose Citizen Science Project (from Scistarter videos)
  - d. Snail Field Notes
  - e. Conduct Citizen Science Project
2. Take Action Project