



CTRL the Future Patch Program



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CTRL THE FUTURE

 gswpa



Once completed, get your free patch by scanning this QR code and filling out the form.

CTRL the Future

You use technology every day—sometimes without even thinking about it! From phones and tablets to video games, streaming music, and smart devices, technology helps people solve problems, communicate, and create amazing things. Technology doesn't think on its own. People design it. People teach it. People decide how it's used.

In this patch program, you'll go beyond using technology and start thinking like the people who create it. You'll practice breaking problems into steps, spotting patterns, working with data, and exploring artificial intelligence (AI). You'll also think about responsibility, fairness, and how technology affects real people.

You don't need to be a computer expert. You don't need special supplies. All you need is curiosity, creativity, and a willingness to try something new.

What is Technology?

Technology isn't just computers, robots, or gadgets. Technology is anything created to solve a problem or make life easier. Wheels, zippers, traffic lights, and apps are all technology.

Technology is everywhere—even things that seem ordinary are inventions someone created to make life better.

How Engineers and Programmers Think About Technology

When designing a new tool or system, engineers and programmers usually consider four key questions:

- What problem needs solving?
 - » *Example:* You need to find an ice cream shop.
- What information goes in (input)?
 - » *Example:* A phone app gets your location and preferences as input.
- What happens inside the system (process)?
 - » *Example:* The app analyzes your location and interests to find the closest ice cream shop.
- What results come out (output)?
 - » *Example:* The app shows you a map with the nearest ice cream shops.

Women in Technology

Women have been shaping technology for hundreds of years, often overcoming big challenges to make amazing contributions. Learning their stories helps us see that girls and women can be inventors, programmers, and tech leaders, too!

Ada Lovelace—The First Programmer

- Wrote the first algorithm designed to be carried out by a machine in the 1800s.
- She imagined that computers could do more than math—they could create music, art, and even tell stories!
- Is considered the very first computer programmer!

Grace Hopper—Programming Pioneer

- Created the first compiler, which translates human instructions into machine code.
- Made programming easier and more accessible for everyone.
- Helped computers understand English—like commands instead of just numbers.
- Discovered the term “bug” in computers when a real moth caused an error in her system!

How to earn this patch:

Daisy	Brownie	Junior	Cadette	Senior	Ambassador
3 Activities + Take Action	4 Activities + Take Action	5 Activities + Take Action	6 Activities + Take Action	7 Activities + Take Action	7 Activities + Take Action

Track what you've done:

Activity 1: Tech in My Day
Activity 2: Inside the System
Activity 3: Human Robot Challenge
Activity 4: If-Then Adventures
Activity 5: Data Detectives
Activity 6: Pattern Power
Activity 7: Is It AI?
Activity 8: Train Your Own AI
Activity 9: AI, Ethics, & You (<i>Cadette, Senior, Ambassador only</i>)
Tech Take Action (<i>All ages must complete to earn the patch.</i>)

Topic 1: Technology All Around You

Technology is more than devices. It's systems, tools, and designs created by people to solve problems. Understanding everyday technology helps you see how human ideas turn into real-world solutions. In this topic, you'll practice noticing technology you usually take for granted and breaking it down into smaller parts. This kind of thinking is the foundation of engineering, coding, and invention. When you understand how systems work, you can imagine ways to make them better—or create something entirely new.

ACTIVITY 1: Tech in My Day

Technology is everywhere—even in places you might not expect! Technology isn't just screens and gadgets. It includes tools, systems, and designs created to solve problems or make tasks easier. This activity helps you notice how much technology supports your daily life—and how every piece of tech follows a system.

Directions:

1. Think about your last 24 hours.
2. Draw or list every piece of technology you used or saw being used.
3. Pick one piece of technology and answer these questions:
 - What information goes in?
 - What does the technology do with that information?
 - What comes out?

Think about it:

- What technology surprised you the most?
- Which one would be the hardest to live without?
- What problem does this technology solve?

This is how engineers understand systems. Breaking technology into parts helps us improve it—or even invent something new.

ACTIVITY 2: Inside the System

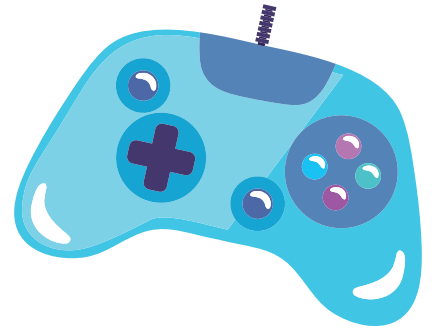
Technology works step by step—even when it seems instant. Every piece of technology is made up of smaller parts working together. Understanding systems helps engineers fix problems and improve designs.

Directions:

1. Choose a familiar technology like a vending machine, video game, or smartwatch.
2. Write or draw each step of how it works.
3. Put the steps in the correct order.
4. Circle the steps where technology makes a choice.

Think about it:

- What happens if one step doesn't work?
- Where do humans interact with the system?
- How could this system be improved?



Topic 2: Coding Without Computers

Coding isn't just typing on a computer—it's a way of thinking. Coding means giving clear, step-by-step instructions and solving problems logically. In this topic, you'll explore how programmers think by becoming both the coder and the computer. By practicing coding without screens, you'll build confidence, communication skills, and problem-solving strategies that apply to all kinds of technology.

ACTIVITY 3: Human Robot Challenge

Computers don't guess what you mean—they do exactly what you tell them to do. Even a small missing detail can change the result. Coding is the art of being clear, detailed, and logical.

Fun Fact: The first computer programs were written on punch cards. One missing hole could cause the whole program to fail!

Directions:

5. Grab a buddy to complete this activity.
6. The first person is the robot, and the second person is the coder.
7. The coder gives step-by-step instructions for a task:
 - Walking to a chair and sitting down.
 - Drawing a simple shape.
 - Building a small stack of objects.
8. The robot follows the instructions exactly as given, even if it seems silly.
9. The coder rewrites instructions to fix mistakes.
10. Repeat this activity until the task is accomplished as intended.
11. Switch roles and try again.

Think about it:

- What instructions were confusing?
- Why is order important?
- How is this like real computer programming?



ACTIVITY 4: If-Then Adventures

Computers use logic rules called conditions to make decisions. These rules tell technology what to do in different situations. Computers don't understand "maybe." They rely on clear yes-or-no conditions.

Directions:

1. Brainstorm real-life rules, such as:
 - If it is raining, then bring an umbrella.
 - If the battery is low, then charge the device.
2. Write each rule as an if-then statement.
3. Turn your rules into a decision tree using arrows or boxes.
4. Test your decision tree with different scenarios.



Think about it:

- Can one situation lead to different outcomes?
- How do computers decide faster than humans?
- What happens when rules contradict each other?

Topic 3: Data Tells a Story

Data is information collected to answer questions, spot patterns, and make decisions. Technology uses data to recommend videos, predict the weather, and even suggest what route to take. In this topic, you'll learn how data is collected, organized, and interpreted—and why asking the right questions matters. You'll also explore the limits of data and why numbers don't always tell the whole story.

ACTIVITY 5: Data Detectives

Data is information collected to answer questions. Apps and websites use data to make predictions, suggestions, and decisions.

Directions:

1. Choose a question. For example: What is your favorite snack?
2. Collect your data by asking your question to a large group of people and collecting their responses.
3. Organize the information into a chart, graph, or picture.
4. Look for patterns, similarities, or surprises.



Think about it:

- What does the data tell you?
- What doesn't it tell you?
- How might technology use this data?

ACTIVITY 6: Pattern Power

Patterns help technology recognize faces, music, handwriting, and speech. AI looks for repeated shapes, sounds, or behaviors. Facial recognition works by identifying patterns in eyes, noses, and mouths.

Directions:

1. Identify patterns in everyday life (music beats, tile designs, dance moves).
2. Create a pattern-based code using shapes, colors, or symbols.
3. Write instructions explaining how to decode the pattern.
4. Trade patterns with another person and decode theirs.

Examples:

- Color patterns: red-blue-blue, repeat
- Symbol code: star = clap, triangle = stomp, square = jump

Think about it:

- Were some patterns easier to recognize?
- How do patterns help computers learn?
- What happens when patterns change?

Topic 4: Artificial Intelligence and the Future

Artificial intelligence (AI) is technology designed to learn from examples and make decisions based on patterns in data. AI helps power voice assistants, filters photos, recommends content, and more. But AI doesn't think like a human—it depends on the data and rules people give it. In this topic, you'll explore how AI learns, where it can make mistakes, and why humans must guide it responsibly. You'll also think about how AI may shape the future.

ACTIVITY 7: Is it AI?

Artificial intelligence helps computers learn from examples instead of following only fixed rules. AI improves over time as it receives more data. AI does not think or feel—it only finds patterns based on information it's given. This activity helps understand the difference between regular programming and AI by sorting real-world examples.

Before you begin:

- If a computer is told exactly what to do every time, it is not AI.
- If a computer learns from data and improves over time, it is AI.
- You are not deciding if the technology is “smart.” You are deciding how it works.

Directions:

1. Read each scenario and determine if it is AI or not AI.
2. After deciding if it is AI or not, ask yourself why and discuss your decision.

Examples:

- A video app that recommends new videos based on what you watch.
- A microwave set for two minutes.
- A phone that unlocks using your face.
- A calculator adding numbers.
- A traffic light that changes on a timer.
- A music app that learns your favorite songs.
- A photo app that groups pictures by people or pets.
- A motion-sensor light.

Can't decide? Think about these questions:

- Does this technology learn over time?
- Does it work the same for everyone, or does it change?
- Who do you think taught this technology what to do?
- What kind of information might it use?
- What would happen if the data were wrong?

Think about it:

- Where do you think AI should not be used?
- How could AI help your school or community?
- What rules would you make for responsible AI usage?

ACTIVITY 8: Train Your Own AI

Machine learning is a type of AI where computers learn by seeing examples. In this activity, you'll act as the AI and experience what it's like to be trained using data. You'll see how mistakes happen, how bias can occur, and why the examples you provide matter. AI can only learn what it is shown—good data = better results.

Supplies:

- Cards, slips of paper, sticky notes
- Markers or pens

**Directions:**

1. Choose a category system to decide what your AI will learn about. Examples include:
 - Animals (pet/farm/wild)
 - Shapes (circle/triangle/square)
 - Emotions (happy/sad/angry)
 - Weather (sunny/rainy/snowy)
2. Create example cards for each category system by drawing or writing examples for each category on cards or paper. Try to make at least 3-5 examples per category.
3. One Girl Scout is the “AI” and sorts the example cards into the categories.
4. Other Girl Scouts can act as “trainers” who provide feedback: correct or incorrect.
5. Add cards that might fit more than one category or are slightly different from the examples provided. Let the “AI” decide where to place the cards and explain their reasoning.
6. Observe mistakes and discuss why some examples were hard to classify. Decide if a mistake happened because of missing information or unclear categories.
7. Repeat training—adjust rules or add more examples to improve accuracy.

Think about it:

- Why were some items hard to sort?
- What happens if training data is missing?
- How could bias affect results?

ACTIVITY 9: AI, Ethics, and You

This activity is geared towards Cadette, Senior, and Ambassador Girl Scouts.

AI can make decisions that affect real people. This activity helps you explore the responsibility of creating, using, and managing AI, and why humans must stay involved in important decisions.

Many companies now have AI ethics teams—people who check that AI systems are fair and safe.

Directions:

1. Discuss real-world AI examples, such as:
 - A self-driving car making traffic decisions.
 - AI used in hiring or school admissions.
 - Chatbots answering questions in customer service.
2. Talk about the potential benefits and risks of each example.
3. Consider these questions:
 - Should AI make decisions that affect people's lives? Why or why not?
 - Who is responsible if AI makes a mistake?
 - How can bias in data affect outcomes?



Think about it:

- What surprised you about how AI can affect people?
- What rules would you set for AI in the future?
- How can Girl Scouts use their leadership skills to influence responsible AI use?

Tech Take Action: Use Technology to Make a Difference

Now that you've learned about technology, coding, data, and artificial intelligence, put your skills to use and help others! Taking action means sharing your knowledge, inspiring curiosity, and encouraging responsible use of technology.

Complete at least one activity to Take Action:

- Create a coding or technology game using sequencing, patterns, or logic.
- Create a family-friendly tech guide and share it with your community.
- Design a poster about responsible AI use.
- Team up with younger Girl Scouts to lead mini-workshops or coding clubs. Share what you learned in this patch program with them.

Every action, big or small, counts! The goal is to share your knowledge, inspire others, and think about how technology can help your community.