

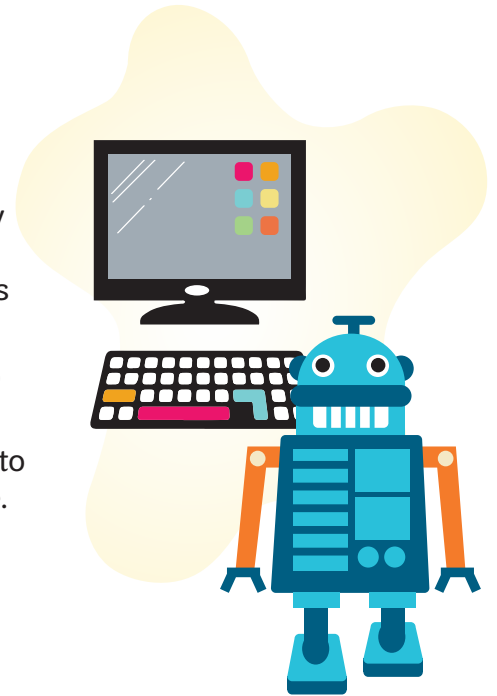
STEM Career Exploration 2

STEM Field Sheets

STEM FIELD: COMPUTER SCIENCE

Change the World with a Career in Computer Science:

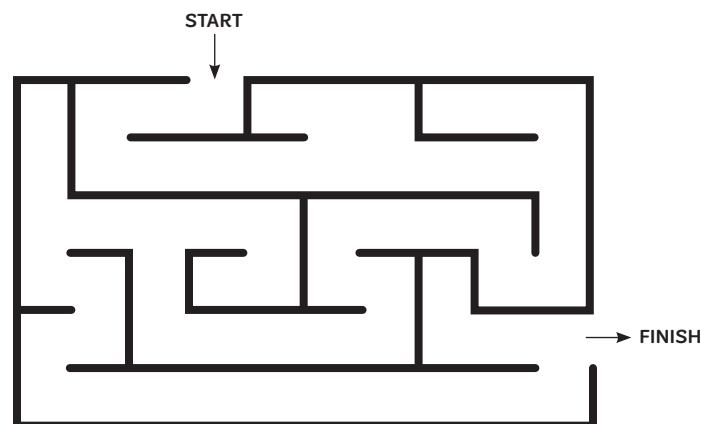
- **Build devices:** **Computer hardware engineers** design, develop, and test computer parts, such as circuit boards and memory chips. They stay on top of what's new and innovative in tech to make sure the new device, like a phone, tablet, or computer, can run the latest apps and other programs.
- **Design robots:** **Roboticians** build robots that can do jobs that are too hard, dangerous, or boring for humans.
- **Solve cybercrimes:** **Digital forensics experts** search for digital clues to keep us, our computers, and all of our data (that's information!) safe.
- **Analyze "big data":** **Data engineers** write code, or instructions, for computers to collect and store large amounts of data.
- **Keep data safe:** **Cryptographers** write code, or instructions, to encrypt sensitive data. This keeps the data safe from hackers and provides privacy for people and businesses.



Can you complete the challenge?

An **algorithm** is a set of instructions to perform a task.

Use these commands to write an algorithm that can navigate a robot through the maze:
Go forward, go back, turn left, turn right.



STEM Career Exploration 2

STEM Field Sheets

STEM FIELD: CREATIVE TECHNOLOGY & DESIGN

Change the World with a Career in Creative Technology & Design:

- **Code apps, websites, or video games:** **Programmers** write code to design things that are both useful and fun: from creating an app, website or video game to animating a movie or TV show.
- **Create digital designs:** Tons of jobs use technology to bring an idea to life! **Architects** use computer software to sketch building plans. **Entertainment engineers** create museum exhibits that light up and respond to the viewer.
- **Design clothing and products:** **Industrial designers** might use a 3D printer to build a new pair of sneakers. **Fashion designers** might use sensors to create clothing styles that react to changes in weather and body temperature.
- **Create sound effects:** **Sound producers** build the noises you hear in movies, TV shows, and video games. They use computers and other technology to record the sounds before careful mixing them to fit the project.
- **Make a statement:** **Visual designers** create everything from logos and products to brochures, ads, and even websites. They use software and other digital tools to illustrate and design products for brands and companies.



Can you complete the challenge?

Criteria are the goals for a product and what's included in its design. **Features** are the parts of the design that make it useful, fun, or different from other products.

Pretend you're designing a new robotic exoskeleton for emergency workers to wear as protection in wildfire situations. Create a sketch and creative brief that explains:

1. The special features of the suit
2. The technology involved in building the suit
3. Any other important criteria or information about the product, like materials, cost, or testing involved

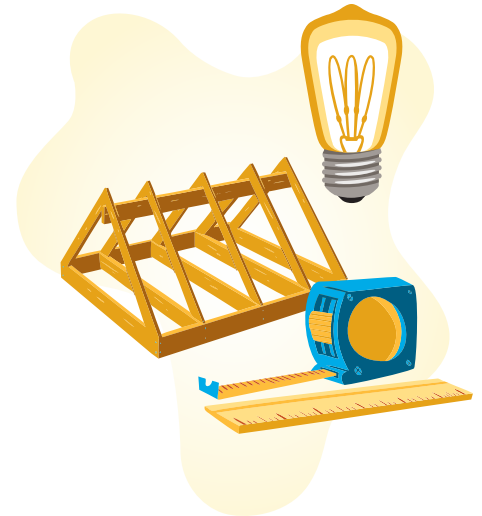
STEM Career Exploration 2

STEM Field Sheets

STEM FIELD: ENGINEERING

CHANGE THE WORLD WITH A CAREER IN ENGINEERING:

- **Engineer our world:** **Engineers** have jobs in every kind of field! They help to build solutions to problems big and small.
- **Understand our world:** **Chemical engineers** work in chemistry, physics, and biology to design new foods, medicines, and materials.
- **Build our world:** **Civil engineers** design infrastructure like bridges, water systems, and roads.
- **Power our world:** **Electrical engineers** build electronics like motors and sensors.
- **Invent our world:** **Mechanical engineers** create all types of machines, from batteries to refrigerators.



Can you complete the challenge?

Engineers look for ways to improve and create new products that make life easier and more efficient. During the Design Thinking Process, they might even do something called **quick prototyping** where they create make lots of sketches to brainstorm new ideas.

For the challenge:

1. Think about a task you do every day, like washing the dishes. Brainstorm a few ways a machine can help make it easier.
2. Draw your ideas down on a piece of paper.
3. If you have other materials and extra time, try to build a simple prototype, or model, of one of your ideas.

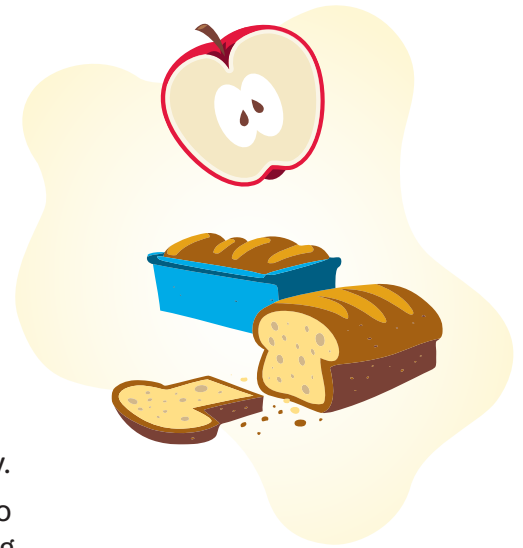
STEM Career Exploration 2

STEM Field Sheets

STEM FIELD: FOOD & AGRICULTURE

Change the World with a Career in Food & Agriculture:

- **Cook and bake:** Chefs and bakers have the important job of making food that's delicious! A **baker** makes tasty food using algorithms (recipes!) and the science of mixing different ingredients together. **Research chefs** create and test new recipes and menus for places like restaurants and hotels.
- **Farm in a city:** **Urban farmers** create green space in vacant lots, backyards, and even rooftops to create gardens and farms in city settings.
- **Design new recipes:** **Food scientists** create new flavors and food combinations to make a new dish or product to be made in a factory.
- **Grow more food:** **Agricultural engineers** find new ways for farmers to grow food and feed more people, like using drones or vertical farming.
- **Innovate agriculture:** **Agricultural scientists** study how plants, land, and animals are used to grow food. They look for ways to improve the quality of the food, the efficiency of the farming, and the impact to the environment.



Can you complete the challenge?

Food scientists and research chefs might take existing recipes and find ways to make them even more delicious.

For the challenge:

1. Design a new recipe that innovates the S'more. How could you use the materials at your station to make a new flavor combination? Would you keep it a sweet treat? Would you add in something salty or savory? What happens if you add something unexpected, like a pickle slice?
2. Once you have a surprising new combination that you think is delicious, write down your final recipe.

STEM Career Exploration 2

STEM Field Sheets

STEM FIELD: HEALTH & WELLNESS

Change the World with a Career in Health & Wellness:

- **Help others to be healthy:** You might first think of a **doctor** or **nurse**, but there are tons of jobs in medicine! For example, a **sports conditioning specialist** trains athletes to be game-ready and stay safe on and off the field.
- **Practice a specialty:** Medical professionals work in all different fields of medicine. For example, **cardiologists** are doctors that focus on the heart, and **speech-language pathologists** work with children and adults who have issues with speech, language, and swallowing.
- **Cure diseases:** **Medical scientists** conduct research to investigate how to treat and prevent people from getting sick.
- **Invent medical devices:** **Biomedical engineers** solve health care problems by designing things like prosthetics and artificial organs.
- **Innovate healthcare:** **Medical robot designers** build robots that can be used for everything from patient care to surgery. Robots can help make a hospital more productivity, reduce the cost of healthcare, and most importantly, help the patient.



Can you complete the challenge?

A **splint** is a piece of medical equipment that can be used to keep an injured body part, like an arm or leg, from moving. It's often used to keep the broken bone in place so it doesn't get further damaged as the person is taken to the hospital.

For the challenge:

1. Imagine your troop is on a hike when one of your fellow Girl Scout sisters trips and twists her ankle.
2. Use the materials at your station to create a temporary splint.

STEM Career Exploration 2

STEM Field Sheets

STEM FIELD: NATURE & THE ENVIRONMENT

Change the World with a Career in Nature & the Environment:

- **Study earth & climate:** **Meteorologists** predict weather and understand how it affects the earth and people. **Hydrologists** do research to understand how water moves across Earth and solve problems related to accessing clean water.
- **Explore the universe:** **Aerospace engineers** are experts on flight and help astronauts travel to space. They develop, design, test, and produce aircrafts, spacecrafts, satellites, missiles, and defense systems.
- **Care for animals:** Some people have jobs that focus on animals—a **veterinarian** treats household animals like cats and dogs, a **zoologist** studies larger animals like elephants, and a **marine biologist** looks at aquatic animals.
- **Protect nature:** **Conservation scientists** are experts on how best to use land without hurting the soil and water. They work at parks and forests to help communities have enough water, minerals, trees, and other resources for today and tomorrow.
- **Prevent pollution:** **Environmental scientists** study how problems like pollution affect nature and human health.



Can you complete the challenge?

Scientists collect and analyze data to understand more about how the world works. In scientific research, **quantitative data** includes numerical information and **qualitative data** includes non-numerical information.

For the challenge:

1. Collective quantitative data about the room you're in. For example, how many people are in the room?
2. Collective qualitative data about the room. For example, what's the layout of the room?