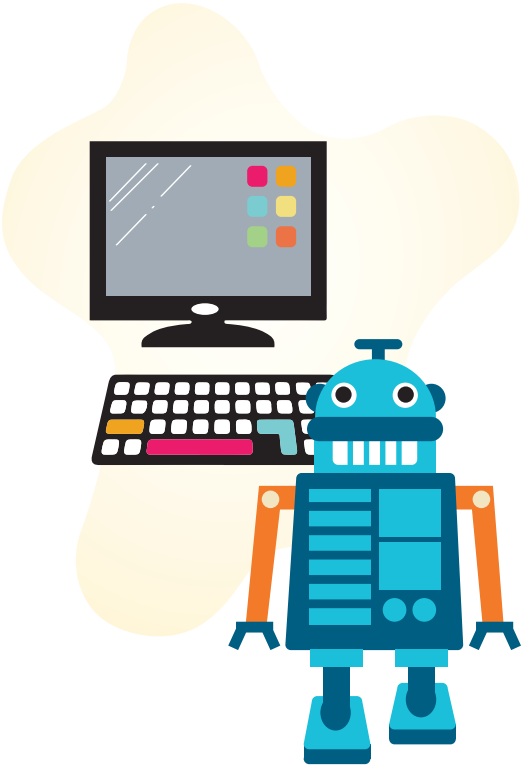
STEM Field: Computer Science

Change the World with a Career in Computer Science:

- **Build devices:** ***Computer hardware engineers*** design, develop, and test computer parts like 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, car, or computer can run the latest apps and other programs.
- **Design with code**: ***Programmers*** write code to design things that are both useful and fun: from creating code for a robot, an app, website or video game to animating a movie or TV show. ***Roboticists*** build machines that complete tasks that are programmed by humans.
- **Solve cybercrimes:** ***Digital forensics experts*** search for digital clues to keep us, our computers, and all our data safe.
- **Analyze "big data:"** ***Data engineers*** write code, or instructions, for computers to collect and store large amounts of data or information. ***Bioinformatics scientists*** use computer programs to collect and analyze data like gene sequences.
- **Keep data and networks safe:** ***Cryptographers*** write code to encrypt sensitive data, keeping it safe from hackers and providing privacy for people, organizations, and businesses. ***Cybersecurity analysts*** monitor and protect networks and their proprietary or sensitive data from hackers. ***Ethical hackers*** use their computer skills to hack into company networks to help them strengthen their safeguards.



Can you complete the challenge?

Imagine you're a **programmer** and explore how computers follow code. Draw a simple image, like a robot or a house. Then, give a friend step-by-step instruction, or an algorithm, to recreate it. Don't let them see your drawing. They should only follow your instructions! After, compare the two images. Did you end up with the same result? Could you use a different algorithm to get the same result?

STEM Field: Creative Technology & Design

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

- **Code apps, websites, or video games:** ***Web designers*** and ***programmers*** design and create engaging websites, apps, and other digital products for different companies and organizations.
- **Create digital designs:** ***Digital sculptors*** create 3D computer models of game characters, vehicles, and other objects for video games, movies, or even 3D printing. ***Architects*** and even some ***carpenters*** use computer software to sketch building plans. ***Medical illustrators*** use computer programs to create detailed scientific images used for research, education, and publication.
- **Design clothing and products:** ***Industrial designers*** use design software and other tools to create physical products like toys, shoes, and other items people use every day. ***Creative designers*** use paper and pencil as well as design software to create special features for vehicles or other products. ***Fashion designers*** might use sensors to create clothing styles that react to changes in weather and body temperature.
- **Create visual and 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 carefully mixing them to fit the project. ***Entertainment engineers*** create museum exhibits that light up and respond to the viewer.
- **Make a statement:** ***Visual designers*** use computers to illustrate and design products like logos, brochures, ads, and websites for brands and businesses.

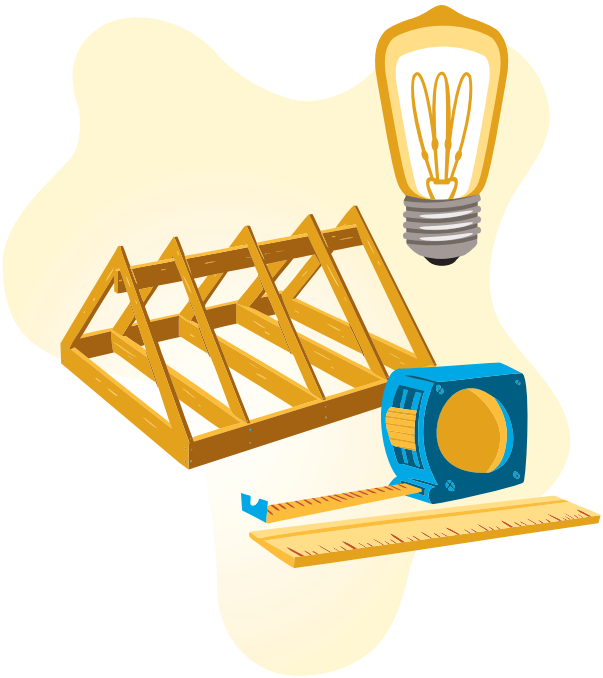
Can you complete the challenge?

Imagine you're applying for your dream job. What is your personal vision for the future? What are your qualifications? Tap into your creative energy like a **visual designer** and design a logo that brands you and your future in STEM. What are the special features of your logo? How does it communicate your message? What technology is involved in creating and sharing it?

STEM Field: Engineering

Change the World with a Career in Engineering:

- **Build our world:** ***Civil engineers*** design infrastructure like bridges, water systems, and roads. ***Mechanical engineers*** create all types of machines, from batteries to refrigerators.
- **Power our world:** ***Electrical engineers*** design machines that use electricity, like personal electronics, electric motors, surveillance systems, and electrical systems for vehicles and aircraft.
- **Invent our world:** ***Chemical engineers*** work in chemistry, physics, and biology to design new foods, medicines, and materials.
- **Explore our world:** ***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. ***Marine engineers*** design a variety of naval ships from smaller sailboats to ocean liners and tankers.
- **Improve our world:** ***Aerodynamics engineers*** test planes and vehicles to find ways to make them safer and operate at their top performance. ***Petroleum engineers*** create new oil and gas extracting technologies while maintaining standards for minimal environmental impacts.



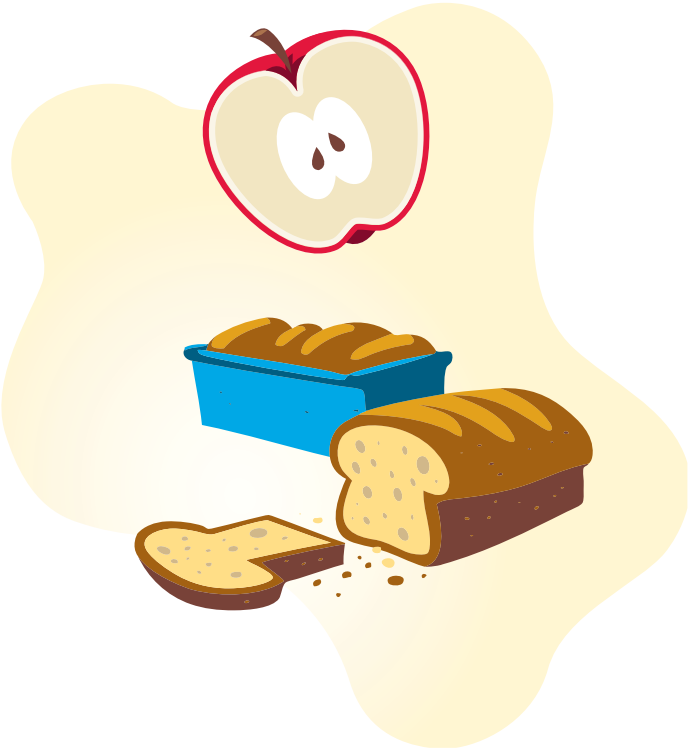
Can you complete the challenge?

Improve your brakes to work their best like you're a **mechanical engineer**. To try it out, analyze your bicycle or scooter brakes, or ask a friend to borrow theirs. Test the brakes. Then, if it's your bike or scooter, use tools to adjust the brakes. If needed, replace the brakes with new ones and adjust for the best function. Compare how they work before and after. How did you decide on the final adjustment? What would you change about the brakes' design? **Important note:** Be sure to wear a helmet and protective equipment.

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 delicious food. Thet make 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*** develop automated machinery for efficient seeding, irrigation, and harvesting of crops. ***Soil and plant scientists*** research and test different soils and nutrient combinations to provide plants with the most ideal growing conditions.
- **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 they grow and the output of farming efforts, while lessening the impact on the environment.



Can you complete the challenge?

How can you make food more accessible? Explore **agricultural engineering** and design a vertical garden to bring more fresh food to a community with little space for fields or beds. What spaces would your design work for? What are the dimensions? What materials will you use? How will the hydration system maximize water usage and plant growth?

STEM Field: Health & Wellness

Change the World with a Career in Health & Wellness:

- **Help others to be healthy and safe:** You might first think of a ***doctor*** or ***nurse***, but there are tons of other jobs in medicine! ***Sports conditioning specialists*** train athletes to be game-ready and stay safe on and off the field. ***Paramedics*** and ***emergency medical technicians*** (EMTs) are trained in CPR, administering medicines, and more.
- **Practice a specialty:** Medical professionals work in all different fields of medicine. For example, ***phlebotomists*** are skilled in taking blood samples for testing; ***speech-language pathologists*** focus on speech, language, and swallowing; ***radiologists*** are licensed to take x-rays, ***oncologists*** provide care for patients with cancer, and ***genetic counselors*** help people identify whether they are at risk for certain diseases based on their health histories.
- **Cure diseases:** ***Medical scientists*** conduct research to investigate how to prevent and treat human diseases. They publish their findings for other scientists and medical professionals to learn from and use their research.
- **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 productive, reduce the cost of healthcare, and most importantly, help the patient.

Can you complete the challenge?

Take on the role of a **medical scientist**. Use magazines, newspapers, or another news source to find a product, practice, or trend that is hazardous to physical or mental health. Then research treatments that may be used. What kinds of warning signs do you see, or do you think should be included? Where would you publish or share your findings and why?

STEM Field: Nature & the Environment

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

- **Study earth and climate:** ***Meteorologists*** and ***climatologists*** predict weather and learn how it affects the earth and people. They use data from satellites, maps, and the atmosphere to predict weather patterns and study climate change. ***Hydrologists*** do research to understand how water moves across the Earth and solve problems related to accessing clean water.
- **Care for animals:** ***Veterinarians*** mostly treat smaller household animals like cats and dogs, but can often focus on livestock animals like sheep, cows, and horses as well. ***Zoologists*** study bigger animals like elephants, and a ***marine biologist*** looks at aquatic animals like fish and dolphins. ***Wildlife rehabilitators*** rescue and treat wild animals that are hurt. They care for them until they are healthy enough to be released back into the wild.
- **Protect nature:** ***Population ecologists*** study organisms and the environment to help keep ecosystems healthy and balanced. ***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 problems like pollution and how they affect nature and human health.

- **Focus on renewable energy:** ***Solar photovoltaic installers*** assemble and maintain solar panel systems. ***Wind turbine technicians*** install and maintain wind turbines.

Can you complete the challenge?

To understand more about nature around you, imagine you are a **population ecologist**. Go outside and remove a rock or layer of mulch. Look at the uncovered sample and collect quantitative data (using numbers) about the different organisms you see. How many ants are there? Pill bugs? Worms? Then collect qualitative, or descriptive, data. What is the soil like? What relationships exist? How might human impact affect this little ecosystem?