



BOYS & GIRLS CLUBS  
OF AMERICA

# FANTASTIC FUTURES!

## STEM Careers You Should Know About

SUPER  
SCIENTISTS



TOP TECH  
WHIZZES



ENGAGING  
ENGINEERS



MASTER  
MATHEMATICIANS



**BONUS:** What kind of STEM career is best for you? **Take the quiz!**

Presented By

SAMSUNG

# STEM- tastic Jobs!

Do you have any bright ideas about the world around you? You might have a STEM-tastic future ahead! STEM stands for science, technology, engineering, and math. Kids who use their STEM skills are great problem solvers and find new ways to make their communities better places. Read on to learn more!



## Dazzle the World With SCIENCE

**Science jobs have something for everyone:** You can work with animals, plants, or the environment. You can learn about Earth, outer space, or the deep sea. Science is everywhere!



### Food scientist

**The scoop:** Food scientists study food and make new foods and flavors.

**You might be a good food scientist if:**

- › You love to eat and try new flavors
- › You think chemistry is cool
- › You like to think of new ways to prepare food

**What do food scientists do?**

- › Create new flavors for foods and drinks
- › Invent foods for astronauts in space
- › Research new ways to package foods to keep them from going bad
- › Test foods for germs
- › Test how many vitamins and minerals are in different foods

**How to get there:**

Food scientists need a college degree. Many have graduate degrees.



### Astronomer

**The scoop:** Astronomers study space—stars, planets, moons, galaxies, and more.

**You might be a good astronomer if:**

- › You love staring at the night sky
- › You're good at math and physics
- › You're curious





## Wildlife biologist

**The scoop:** Wildlife biologists study wild animals and the ecosystems they live in.

**You might be a good wildlife biologist if:**

- › You love animals
- › You like to write
- › You love to spend time outdoors

**What do wildlife biologists do?**

- › Study animals and how they interact with other species
- › Collect animals, plants, and other specimens to study in the lab
- › Design experiments with animals in labs or in the wild
- › Help make plans for protecting wild species
- › Write research papers and reports

**How to get there:** Most wildlife biologists have at least a college degree. Those who do research at universities have graduate degrees.

**What do astronomers do?**

- › Help plan missions to other planets
- › Use telescopes and other technology to study objects such as stars, comets, asteroids, and black holes
- › Design new tools like telescopes
- › Analyze data using computers and math
- › Write research papers and reports

**How to get there:** Most astronomers need a graduate degree.

## Meet Forensic Scientist in Training Martha Olang

**Q. What does a forensic scientist do?**

**A.** Forensic scientists use a range of sciences to answer questions related to legal situations. Both technology and math are a big part of forensic science. Today scientists use DNA tests, high-performance liquid chromatography, 3D computer imaging, and other advanced technologies to reconstruct crimes and accidents. The new technology can distinguish trace elements, uncover hidden crimes, convict the guilty, and free the innocent.



Martha is a sophomore at Chaminade University of Honolulu, majoring in forensic science.

**Q. What area of this field do you plan to work in?**

**A.** I hope to work in the field of fingerprint analysis and crime scene investigation. I am a very detail-oriented person and being able to go to a crime scene, look for evidence, bring it back to the lab, and process items for fingerprints really interests me.

**Q. What challenges did you have to overcome to become a scientist?**

**A.** School was very difficult for me until I joined the Boys & Girls Club. My mother only spoke Spanish, so it was very hard for me to ask her for help with my homework. When I joined the Boys & Girls Club, I was able to ask the staff for help. Also, I have had to overcome the stereotypes often associated with teens that look like me. One reality is that Hispanic women are underrepresented in the STEM fields. However, I am determined to change that.

**Q. What's your advice for a kid who wants to be a scientist?**

**A.** Believe in yourself, ask for help, always give it your best, and work hard. This will set you apart from other people and will make you a great scientist. Stay committed—it can be easy to just give up but do not fall into the trap. Also, stay open-minded. Everything may not come out as you expect, but if you keep the end goal in mind, you will reach your dreams. Lastly, have fun!

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📺 **Watch Scientists at Work!** <http://to.pbs.org/1pegxPO>

📄 **Find the STEM Career for You!** <http://bit.ly/1h7Sqs9>

**Are you into computers?** Do you love to fiddle with phones and portable devices? You're in luck. Technology jobs are hot and getting hotter!



## Software developer

**The scoop:** Software developers create new computer programs.

**You might be a good software developer if:**

- › You love computers
- › You like organizing things
- › You're a good problem solver

**What do software developers do?**

- › Study the needs of computer users
- › Design and test products such as games, databases, or operating systems
- › Plan how all the pieces of a computer program will work together
- › Make diagrams to explain how to write the software code
- › Work in teams with others to fix software problems

**How to get there:** Most software developers need a college degree in computer science.

## Web developer

**The scoop:** Web developers design websites.

**You might be a good web developer if:**

- › You like understanding how things work
- › You're creative
- › You spend a lot of time online

**What do web developers do?**

- › Talk with clients to understand what they want their websites to do
- › Write computer code to make the website work
- › Choose colors and images to make the site easy to use
- › Make sure graphics, audio, and video all work together

**How to get there:** Most web developers need a two-year degree in web design. Some need a four-year college degree.



## Network security analyst

**The scoop:** Network security analysts protect a company's computer networks from hackers.

**You might be a good network security analyst if:**

- › You understand complicated games and situations
- › You like to figure out where problems start
- › You pay attention to details

**What do network security analysts do?**

- › Monitor the computer network for attacks
- › Install programs to protect the company's information
- › Design tests to look for weaknesses in the company's computer system
- › Stay up to date on computer security news

**How to get there:** Most network security analysts have a college degree in a computer-related field.



## 3D animator

**The scoop:** This type of animator uses computers to make 3D images for movies, commercials, or video games.

**You might be a good 3D animator if:**

- › You're artistic
- › You love going to the movies
- › You're good at math and computers

**What do 3D animators do?**

- › Map out scenes for new animated movies
- › Use computers to create 3D characters for animated films and games
- › Produce special effects like smoke and explosions
- › Work with a team to edit animations

**How to get there:** Most animators need a college degree in computer graphics or art.



## Meet Industrial Technology Engineer Trina Fletcher

**Q. What does an industrial engineer do?**

**A.** As an industrial engineer, I worked to help improve manufacturing and production processes so that they were as efficient as possible. Currently, as an engineering education researcher, I am working to help increase the avenues available for people of diverse backgrounds to have access to science, technology, engineering, and math educational programs. I am especially passionate about increasing the amount of minorities and girls going into STEM fields.



Trina is an engineer in industrial technology and applied engineering and a PhD student at Purdue University studying engineering education research.

**Q. What do you love most about engineering?**

**A.** You get to work with a lot of different people from all over the world and work with groundbreaking technology, research, and products.

**Q. What challenges did you overcome to become an engineer?**

**A.** I had to understand that many of my co-workers had never worked so closely with an African-American and for some with a woman. By falling in both categories, it seemed as though I had to work twice as hard to prove that I was qualified for each of my roles but that process made me stronger.

**Q. What are the skills you use most often as an engineer?**

**A.** You have to be comfortable with thinking outside the box and not be afraid to present new ideas. It is okay to be creative. Creativity is what drives innovation and that is what all engineering companies want and need. All engineers have the technical skills but only some are truly creative.

**Q. What's your advice for a kid who wants to be an engineer?**

**A.** Do it! If you don't think you're good in math or science, find ways to make it interesting to you so that you can build your skills in those areas. Always work hard, and stay positive and focused on your goals. Don't let anyone or anything get in the way of becoming who you want to become.

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 📱 **Play the STEM Career Game!** <http://ionfuture.org>



# ENGINEER

The World  
We Live In

**Buildings, cars, highways, and cities:** Engineers design the systems that make our world work. Here are just a few of the cool things engineers can do!



## Automotive engineer

**The scoop:** Automotive engineers create the ideas, designs, and machine parts for cars.

**You might be a good automotive engineer if:**

- › You love cars
- › You like to use your imagination
- › You like to take things apart to see how they work

**What do automotive engineers do?**

- › Design new fuel-efficient engines
- › Test how cars will protect passengers in a crash
- › Make cars safer and more comfortable
- › Develop exciting new car designs
- › Look for problems when a car's systems don't work right

**How to get there:** Most automotive engineers need a college degree in mechanical engineering. Many have graduate degrees.

## Drafter

**The scoop:** Drafters take designs from engineers and architects. Then they turn them into technical plans.

**You might be a good drafter if:**

- › You enjoy using computers
- › You like to be part of a team
- › You're good at spotting details and problems

**What do drafters do?**

- › Turn sketches into technical drawings
- › Create plans for all kinds of products: toys, toasters, skyscrapers, spaceships, and more
- › Use special computer programs to create design plans
- › Work on a team with engineers and architects

**How to get there:**

Most drafters complete a technical program or two-year college.



## Landscape architect

**The scoop:** Landscape architects design areas for spaces like parks, playgrounds, and gardens.

**You might be a good landscape architect if:**

- › You like to spend time outside
- › You enjoy working with other people
- › You're good at coming up with creative solutions



## Civil engineer

**The scoop:** Civil engineers design big construction projects like dams, bridges, and water-supply systems.

**You might be a good civil engineer if:**

- › You want to build big things
- › You're good at math and problem solving
- › You have good writing skills

**What do civil engineers do?**

- › Study reports and maps to plan projects
- › Learn about government rules and apply for project permits
- › Test soil and building materials
- › Use computers to design new projects
- › Test buildings to make sure they are safe and strong

**How to get there:** Civil engineers need a college degree. Some have a graduate degree. They usually need to earn an engineer's license.

**What do landscape architects do?**

- › Fix damaged places like wetlands or rivers
- › Design gardens that collect storm water or trap air pollution
- › Repair historic places
- › Design new public places such as parks
- › Use computers to create models of new landscape designs

**How to get there:** Most landscape architects need a college degree. Some need a graduate degree. They must also earn a landscape architect's license.

## Meet Mechanical Engineer in Training Brianna Sheperd

**Q. How and when did you know you wanted to be an engineer?**

**A.** I grew up as a great math student, and science was always my favorite subject. However, I never was sure of my career path because I felt there were so many options. Eventually, I received inspiration from a trip I took to NASA Space Camp through the Boys & Girls Club. After spending a week surrounded by the hard work and ingenuity of scientists and engineers, I knew that was the world I wanted to be a part of.



Brianna is a sophomore at Stanford University planning to major in mechanical engineering.

**Q. Was school hard or easy for you?**

**A.** As a young child, I thought that school was easy and good grades were normal. But in secondary school, I ran into situations where I thought the workloads were impossible to handle. I drew motivation to stay focused from my desire to succeed and pursue my goal of becoming an engineer. Once I knew where I wanted to go, nothing could stop me from getting there.

**Q. Who's your biggest inspiration and why?**

**A.** I have always looked up to my father. As a member of the United States Air Force, he has sacrificed so much for both his country and my family. He also influenced my interest in engineering. Working as an aircraft mechanic when he entered the military, my dad was the first to teach me how to work with my hands. Just because I was a girl, it didn't mean that I shouldn't know how to fix a car or build a doghouse.

**Q. What did the Boys & Girls Club do for you?**

**A.** The Boys & Girls Club has had a huge impact on my life. It was in large part the reason I chose to pursue a career in engineering, as well as the place where I developed skills as a leader. Over many years of membership, I have found friends who support me and mentors who encourage me to be the best version of myself.

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🔗 **Engineer Your Path** <http://bit.ly/1hZLQUJ>

👩 **Girls Who Engineer** [www.engineergirl.org](http://www.engineergirl.org)



# Problem Solving With MATH

**These awesome jobs have one thing in common:** Killer math skills! But these jobs aren't just about numbers. Depending on your path, you'll also need creativity, communication skills, and/or a love of the outdoors. Math comes in handy in many kinds of careers.



## Land surveyor

**The scoop:** Land surveyors map the environment to determine property borders.

**You might be a good land surveyor if:**

- › You want to work outdoors
- › You like gadgets
- › You pay attention to small details

**What do land surveyors do?**

- › Take measurements to help architects and builders plan new construction
- › Map crime scenes for court cases
- › Survey land under the ocean to look for oil or find hazards that could damage boats
- › Use tools like scanners, cameras, and computers to measure distances and make maps

**How to get there:** Some land surveyors learn by being an apprentice. (They train with an experienced land surveyor.) Others get a four-year college degree.

## Financial analyst

**The scoop:** Financial analysts help people manage their money.

**You might be a good financial analyst if:**

- › You're a good communicator
- › You have strong math and computer skills
- › You can make quick decisions

- › Help clients figure out the best ways to invest their money
- › Work with other analysts

**What do financial analysts do?**

- › Learn about financial history and new money trends
- › Study companies' financial information

**How to get there:** Financial analysts must have a college degree. Many also need a graduate degree. They also must earn a special professional license or certificate.



## Actuary

**The scoop:** Actuaries estimate how likely certain events are—and how much they might cost.

**You might be a good actuary if:**

- › You're interested in the future
- › You like to understand why events happen
- › You're good at explaining complex information

**What do actuaries do?**

- › Use computers to gather and analyze data for insurance companies and other clients
- › Estimate the likelihood of certain events—such as illnesses, accidents, floods, or fires—occurring
- › Figure out how much those events are likely to cost
- › Produce charts and reports to explain their estimates





## Statistician

**The scoop:** Statisticians collect and analyze data to solve real-world problems.

**You might be a good statistician if:**

- › You're logical and a critical thinker
- › You're good at creating categories and solving math problems
- › You can write and speak well to communicate your findings

**What do statisticians do?**

- › Use statistical methods to solve practical problems in science, engineering, business, and other fields
- › Decide what statistical methods will best solve a particular problem
- › Design surveys, polls, or experiments to collect data
- › Analyze and interpret the data
- › Present findings in ways that other team members can understand

**How to get there:** Statisticians usually have a college degree, plus a graduate degree in statistics or math.

**How to get there:** Actuaries need a college degree. They must pass a series of exams to become certified.



## Meet Astrophysicist Alex Filippenko, PhD

**Q. What does an astrophysicist do?**

**A.** I conduct research to better understand the universe and its contents. In particular, I concentrate on exploding stars, black holes, and the expansion [increasing size] of the universe. Telescopes collect and measure light from these objects. Then I analyze and interpret the data from the telescopes. I also teach astrophysics classes.



Alex is an astrophysicist and a professor of astronomy at the University of California, Berkeley

**Q. What would people be surprised to find out about your job?**

**A.** Many people think that astronomers conduct research by looking through telescopes. But actually we collect data with sensitive electronic detectors and analyze the data with computers.

**Q. What are the skills you use most often as a scientist?**

**A.** I use critical thinking and logical reasoning all the time. I also use math and physics to help understand the objects that I'm studying.

**Q. What challenges did you overcome to become a scientist?**

**A.** I had to overcome the fear of failure. Sometimes, a problem that you're working on is just too difficult, or an experiment doesn't turn out well. When it comes to science, there isn't always a clear path.

**Q. What has been the greatest moment in your career so far?**

**A.** I was a key member of the teams that discovered the accelerating expansion of the universe [the fact that the universe is getting bigger at a faster rate over time]. This was a very unexpected discovery, and it has revolutionized how we view the universe.

**Q. What's your advice for a kid who wants to be a scientist?**

**A.** Work really hard at achieving your goals and don't give up! It's amazing what people are capable of when they are passionate and motivated. Find a profession that you really love. Do something that brings you happiness and fulfillment. Study a lot in school and keep wondering about nature. Many scientists initially doubted their ability to succeed, but they persevered.

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# What Kind of STEM Whiz Are You?

## Do you love numbers?

Or are you a scientist at heart?  
Do you like tech tools? Or do you  
want to design new things?  
Take the quiz to find out which  
**STEM career field**  
is your perfect fit!



### 1 Which science fair project sounds like the most fun?

- a. Removing DNA from vegetables
- b. Designing a new cell phone app
- c. Making a solar-powered model car
- d. Figuring out the best angle for a winning basketball throw

### 2 You have a day off from school. What do you do all afternoon?

- a. Train your family pet
- b. Surf the Internet
- c. Build a model rocket
- d. Study baseball batting averages

### 3 You're bored in study hall and doodling in your notebook. What would you draw?

- a. The solar system
- b. Your favorite video game characters
- c. Cars and airplanes
- d. 3D shapes like cubes and cylinders

### 4 Which adjective describes you best?

- a. Curious
- b. Forward-thinking
- c. Creative
- d. Logical

### 5 You're stuck in the car on a long, boring trip. You decide to play a counting game to pass the time. What do you count?

- a. Types of trees
- b. Car models
- c. Bridges and tunnels
- d. The number of miles you travel

## If you answered...

### Mostly As:

Consider a career in science. Science is a great choice for curious people who want to find out how the world works!

### Mostly Bs:

Consider a career in technology. Tech careers are perfect for people who like to be on the cutting edge!

### Mostly Cs:

Consider a career in engineering. Engineers design the products and systems that keep society moving!

### Mostly Ds:

Consider a career in math. Lots of great jobs need people who are good at numbers!