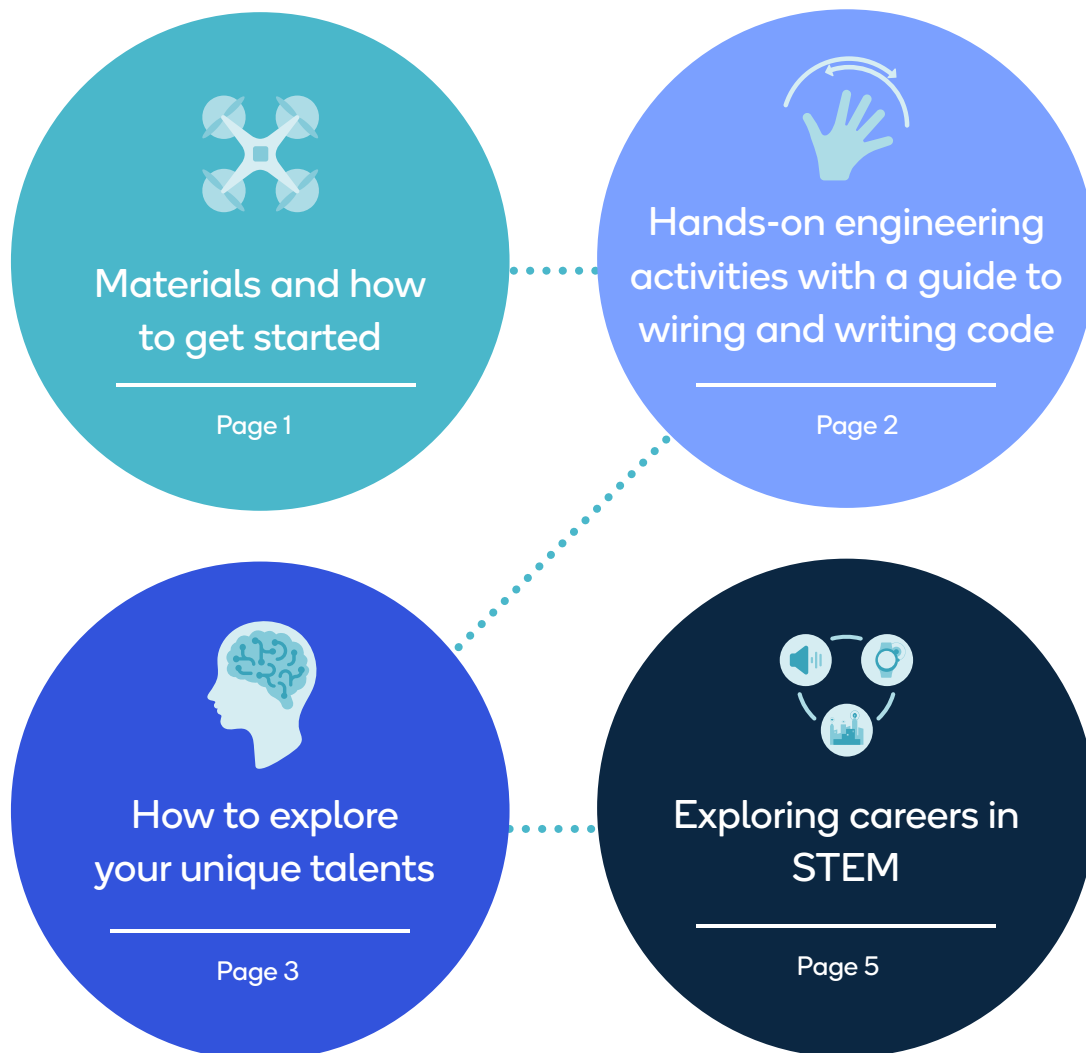


Welcome to the Qualcomm® Thinkabit Lab™ Learning Center, a free online resource developed for adult educators to introduce students to the world of coding and engineering! Thank you for being a part of inspiring the next generation of innovators.

The Learning Center offers a variety of STEM education resources to introduce students to coding and engineering. Activities range from learning how to wire and program a microcontroller to exploring future careers in technology.

This document has been created as a tool to provide guidance while navigating our website and engaging with the activities. While this is not a replica of our signature program, it is a taste of the main components that comprise it.

This guide will cover:



Materials and how to get started

Download the [Technical Guide](#) to learn:

- How to download the Arduino software
- How to purchase materials and put together the hardware kit
- Learn about how the Arduino Uno and breadboard work
- Learn how to troubleshoot common errors



Let's Code!

Hands-on engineering activities with a guide to wiring and writing code

We offer several hands-on coding and engineering challenges. Follow the links provided for detailed step-by-step instructions on how to complete these awesome activities!

1. Explain to students how a circuit works. Here is a [circuit overview video](#).
2. [LED Blink](#) with [Guided Video](#)
3. [Servos](#) with [Guided Video](#)
4. [Comparing the 2 servos](#)
5. Keep Coding! To access more engaging hands-on engineering and coding activities, visit the [Thinkabit Lab Learning Center](#)

Tip: Each activity has challenges at the end. These are great to extend the lesson or to have those who finish early work on while you are working with other students.



Are you interested in learning how to integrate LEDs and servos into robotic creations?

The next step would be to have students build something that incorporates the LED or servo. This is a good time to talk to children about how we see these being used in the real-world. Think...where do we see movements similar to that of a servo? What else can that movement represent? We like to use basic crafting materials that are inexpensive and readily accessible. As students build, they will need to adjust their code to account for the timing and movements that they need.

See some examples of [student projects](#).

Career Exploration

Qualcomm is a global company of inventors that includes people with diverse skills, backgrounds, and cultures who are part of inventing the wireless world of the future. At the Learning Center, students can explore careers in STEM, discover what their interests are, and learn how their interests relate to the world of work.



We start our career section by having students look at their unique talents. Understanding themselves through exploring their strengths, interests, and values (SIVs) will help them when looking for possible future education paths and careers.

The O*Net is a great tool to explore careers with students but can be a little overwhelming. The following will help you navigate this tool. Make sure to have kids look up electrical engineers, mechanical engineers, and computer scientists since they took on those roles when going through the engineering projects and the build.

SIVs: Exploring our strengths, interests, and values.

In this [video](#), one of our Thinkabit Lab instructors will guide you through career activities and introduce you to the [O*Net OnLine](#) and [O*Net Interest Profiler](#).

After a discussion about SIVs, have students take the Interest Profiler. Students will be asked 60 questions about things people do in a variety of careers and how interested they are in that task.

Task	1	2	3	4	5
Build kitchen cabinets	○	○	○	○	○
Lay brick or tile	○	○	○	○	○
Develop a new medicine	○	○	○	○	○
Study ways to reduce water pollution	○	○	○	○	○
Write books or plays	○	○	○	○	○
Play a musical instrument	○	○	○	○	○
Teach an individual an exercise routine	○	○	○	○	○
Help people with personal or emotional problems	○	○	○	○	○
Buy and sell stocks and bonds	○	○	○	○	○
Manage a retail store	○	○	○	○	○
Develop a spreadsheet using computer software	○	○	○	○	○
Proofread records or forms	○	○	○	○	○

Discussing Results

O*Net breaks up careers into these RIASEC categories:

[Realistic](#) — Realistic occupations frequently involve work activities that include practical, hands-on problems and solutions. They often deal with plants, animals, and real-world materials like wood, tools, and machinery. Many of the occupations require working outside and do not involve a lot of paperwork or working closely with others.

[Investigative](#) — Investigative occupations frequently involve working with ideas and require an extensive amount of thinking. These occupations can involve searching for facts and figuring out problems mentally.

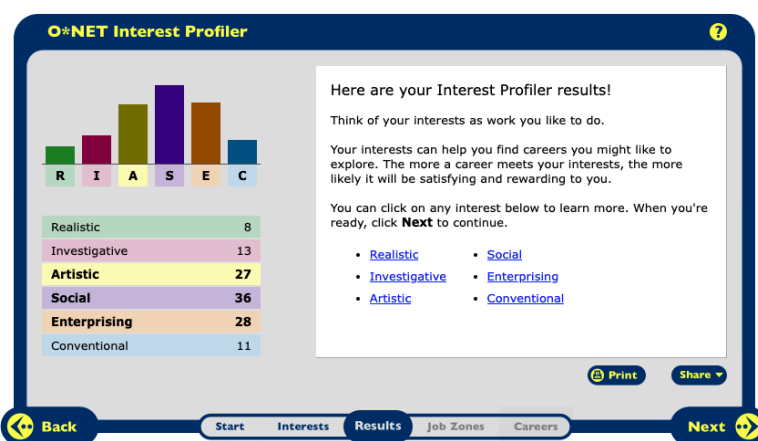
[Artistic](#) — Artistic occupations frequently involve working with forms, designs and patterns. They often require self-expression and the work can be done without following a clear set of rules.

[Social](#) — Social occupations frequently involve working with, communicating with, and teaching people. These occupations often involve helping or providing service to others.

[Enterprising](#) — Enterprising occupations frequently involve starting up and carrying out projects. These occupations can involve leading people and making many decisions. Sometimes they require risk taking and often deal with business.

[Conventional](#) — Conventional occupations frequently involve following set procedures and routines. These occupations can include working with data and details more than with ideas. Usually there is a clear line of authority to follow.

Go over these with students and have them add these to their SIVs sheet for the ones that represent their SIVs. Students can also click each category to learn more and see what this would look like in a possible career.



Mechanical Engineers
Also called: Design Engineer, Mechanical Engineer, Process Engineer, Product Engineer

What they do: Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of equipment such as centralized heat, gas, water, and steam systems.

On the job, you would:

- Read and interpret blueprints, technical drawings, schematics, or computer-generated reports.
- Research, design, evaluate, install, operate, or maintain mechanical products, equipment, systems or processes to meet requirements.
- Confer with engineers or other personnel to implement operating procedures, resolve system malfunctions, or provide technical information.

KNOWLEDGE

- Engineering and Technology**
 - product and service development
 - design
- Math and Science**
 - arithmetic, algebra, geometry, calculus, or statistics
 - physics
- Arts and Humanities**
 - English language
- Manufactured or Agricultural Goods**
 - manufacture and distribution of products

PERSONALITY

People interested in this work like activities that include **ideas**, **thinking**, and figuring things out.

They do well at jobs that need:

- Analytical Thinking
- Attention to Detail
- Innovation
- Dependability
- Cooperation
- Integrity

TECHNOLOGY

You might use software like this on the job:

- Analytical or scientific software**
 - Minitab
 - The MathWorks MATLAB
- Instant messaging software**
 - Blink
- Computer aided design CAD software**
 - Autodesk AutoCAD Civil 3D
 - Autodesk Revit

EDUCATION

bachelor's degree usually needed

Get started on your career:

- Find Training
- Find Certifications
- Find Licenses
- APPRENTICESHIP GOV

JOB OUTLOOK

New job opportunities are likely in the future.

Average SALARY: \$90,160

Salary range: \$58,410 to \$141,060

Check out your state Local Salary Info Find Jobs

EXPLORE MORE

- Chemical Engineers
- Civil Engineers
- Computer Systems Engineers/Architects
- Electrical Engineers
- Energy Engineers

You might like a career in one of these industries:

- Manufacturing
- Professional, Science, & Technical

Exploring Job Zones

The career page will have students look at jobs based on the amount of job preparation they are interested in, looking at experience, training, and education. Once they explore these and determine which one aligns with their values, they will be shown careers within this job zone that meet their interest categories. Clicking on a career will give students a summary page that looks like the image to the left.

Have them look at experience, education, wages, job description, and of course if they meet their SIV.

To search other careers, just type them in the search feature by clicking the icon of the magnifying glass.

There are even more search options when you go to the O*Net Online

Under "Find Occupations", you can choose "STEM" in the drop-down menu or go to "Advanced Search" and you can search by:

Abilities (strengths)
Skills (strengths)
Work values (values)

Interests (interests)
Work context (values)

Knowledge (strengths/interests)
Work styles (values)

Some great STEM careers to explore:

Electrical Engineer	Computer Scientist	Robotics Engineer
Web and Digital Interface Designers	Information Security Analyst	Biomedical Engineer
Precision Agricultural Specialist	Special Effects Artist/Animators	Environmental Scientist
Sound Engineering Technicians	Climate Change Policy Analyst	Data Scientist

Suggested timeline for a week program that is 1-2 hours per day

