Engineering Scavenger Hunt

iRobot Education

An **engineer** is a professional who uses science and math to solve everyday problems.

There are lots of different kinds of engineers, and they all do different things. The best part of engineering is everyone works together to solve a problem.

This activity asks you to find some of the things that each of the different engineers might use on their job, or might have created, or might be associated with that kind of engineering. When you find the object, check it off on your list, and then tell us where you saw it. Make sure you go find ***real*** objects: pictures online don't count!

Civil Engineers

Civil Engineers design and build much of the world around us. They focus on bridges, highways, and waterways. They need to know about soil, steel, concrete and the things we use to build the infrastructure we need to live our lives.

Objects they design:	**Where did you find it?**
Concrete sidewalk	
Catch basin (storm drain) or manhole	
Traffic light	
Tools they use:	
Tape measure or ruler	
Camera for recording	

STEM Subject(s):

Engineering, Inspiration

Supplies:

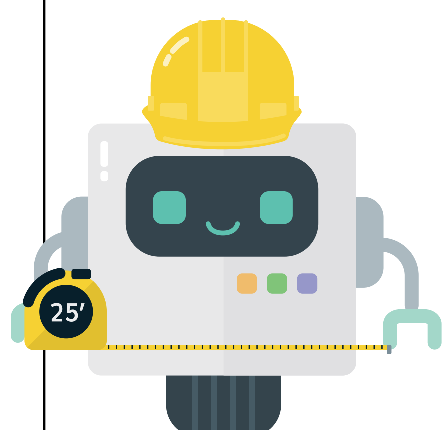
- This printed document
- A pen or pencil

Additional Resources

- Video: Take Apart a Robot (Roomba i7)
  Meet a few different types of engineers while seeing what is inside of the Roomba i7.
- Careers in Tech: Engineering PDF
- Careers in Innovation: Who helps Innovate?

Learn More

Who invented the three-light traffic signal? Find out by reading our Generations of STEM Biographies in the Learning Library.



Electrical Engineers

Electrical Engineers design the circuits, power and energy that make the things around us light up, move and communicate. They are critical now with the many Smart devices in a home connecting our world and making our lives easier.

Objects they design:	**Where did you find it?**
Device that uses Wi-Fi	
Wires	
An LED (Can be inside an object or device)	
Tools they use:	
Tweezers	
On/Off switches	

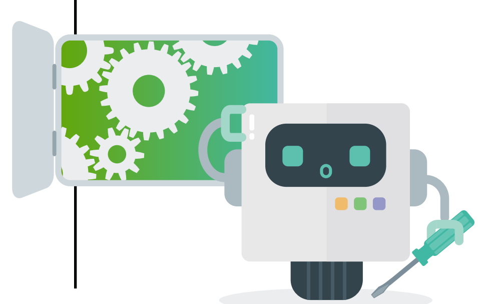
Mechanical Engineers

Mechanical Engineers are all about parts, widgets, gears and making things. They design the parts, figure out how to manufacture them, and make prototypes. Their work might be a jet engine, a kitchen spatula or a case for a phone, but they figure out how it goes together. Much of their work is also in power and energy, so often they work on heating systems, refrigeration, or turbines.

Did you know?

The "power symbol" found on many electronics today is a combination of the "power on" and "power off" symbols used on rocker switches since the early 1970s.

The "power symbol" is an example of a common graphic icon.

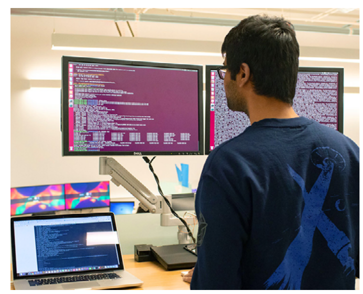


Objects they design:	Where did you find it?
Kitchen appliance	
Car engine	
Thermostat	
Tools they use:	
Screwdriver	
Graph paper for sketching	

Software Engineers

Software engineers give devices a brain, programming the information for the device to use. They might work on computers, phones, cars, appliances, vacuums: all are computers. Many develop apps for mobile devices to control everyday objects. Much of what we use today includes software.

Objects they design:	Where did you find it?
Smartphone	
Dishwasher or washing machine	
Car dashboard	
Tools they use:	
Computer for programming	
Steps in a set of instructions	



This software engineer at iRobot writes software code on three different monitors. That's a lot of code!

Materials Engineers

Materials engineers figure out what to use to make something, and if it's going to hold up to the task. Some objects are plastic, some are metal. Some things come rated for how much weight they can hold, and some things let you know if they can go in the dishwasher. All of this was figured out by the materials engineer—they study the properties of the material, test it, and make sure it meets the requirements for that object.

Objects they (help) design:	**Where did you find it?**
Airplane	
Earbuds or headphones	
Sports ball	
Tools they use:	
Scale (bathroom or food)	
Thermometer	

Industrial Engineers

Industrial designers work on creating and developing concepts that make things function better or add value and a better appearance.

Every object that you interact with on a daily basis in school, work or at home is the result of the design process by an industrial designer. From the shape of your phone to the way you open a car door, they think about how to make it better. Using pencil and paper is where a lot of designs start.

Did you know?

Materials science is one of the oldest forms of engineering, tracing its roots back to metallurgy. Early materials that shaped human history included bronze, iron and steel.

Today, materials science focuses on the three broad categories of ceramics, metals, and polymers.

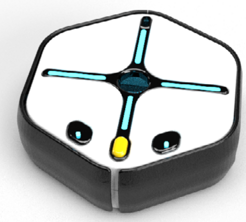
An industrial engineer at iRobot checks material color by using a special light box.

Objects they design:	**Where did you find it?**
Car door handle	
Two different textured buttons on an electronic	
A tool made up of two or more different materials (wood, metal...)	
Graphic icons	
Tools they use:	
Pencil and paper	
Blocks or clay for building shapes	

Did you know?

LED is an acronym that stands for Light-emitting Diode. A diode is an electronic with two terminals, allowing electricity to pass through in one direction.

You might know a certain robot that uses several LEDs...



Continue the Scavenger Hunt: Review

By looking around and exploring the everyday objects in your environment, can you help complete these STEM activities?

1) LED Lightbulb was designed by a(n) ___________________ engineer.

2) Something around you that a software engineer programmed: _____________________________________

3) Two things you may come across that required civil engineering:

_______________________ & ________________________

4) Find the closest electronic device near you with LEDs:

____

5) List three objects around you with different shaped handles:

- ____
- ____
- ____

6) Find a set of instructions (recipe, manual, numbered list:

- What's the task being explained? ________________
- How many instructions are in the set? ____________

7) Find an object that requires the given tool to build it. Write the name of the object.

- Screwdriver: ________________________________
- Saw: ____________________________________
- Soldering Iron: _____________________________

8) Find three icons around your environment (such as a 'save' or 'power' icon on an object.) Draw them below:

A **soldering iron** is a tool for melting solder (a fusible metal alloy) and applying it to metals that are to be joined (typically wires.)

9) Find two items that seem like different kinds of plastic. Write the names of the objects below.

- ______________________________
- ______________________________

10) Find two examples of the same object made with different materials: (Example: plastic fork + metal fork)

- Object: ______________________________
- Material #1: ______________________________
- Material #2: ______________________________

11) Find an object made with wood and metal parts. What did you find?

____

12) Find an object made with metal and plastic parts. What did you find?

____

Thinking Further

Consider your objects that you found for Question #10: What are the advantages and disadvantages of each material used?

What are the pros and cons of a metal fork vs. a plastic fork? Would you use them for the same situations?

What if you had a fork made out of chocolate?

Think about usability, cost, appearance, and physical properties of the materials.