



BUILD Activities April–August 2019

Innovative thinking helps us shape the world around us. Activities for the BUILD theme explore how we use our creativity to construct solutions to different challenges, environments, needs, and purposes and tweak existing inventions for more than one use.

Spark!Lab activities are designed around common themes that connect to the National Museum of American History collections and exhibitions. Themes are developed broadly to incorporate a wide range of collections and will change every four months, ensuring that regular visitors have something new to explore.

CREATE A STRONG BRIDGE

Bridges give us a way to travel over a gap. There are five major types of bridges: beam, truss arch, cantilever, suspension, and cable stayed. Each design achieves the same goal but in a different way. Judge James Finley created the modern suspension bridge. In 1801, he designed a 70-foot-long bridge to cross Jacob's Creek in western Pennsylvania.

What type of bridge will you invent? How much weight will it hold? Look for the James Finley bridge model on display in *Spark!Lab*.

INVENT A DEVICE THAT CAN DRIVE THROUGH A PIPE

Pipes are all around us. They can carry and move water, fuel, gases, or waste so that we can do many daily activities—at home, school, work, and even at the museum! We have to inspect and look inside pipes to check on them and keep them working. Checking inside means that important liquids and gases will be there when we need them.

What will you invent to check the inside of pipes? How will your invention check long sections of pipe? Look for pipes in the ceiling as you explore your home, school, or the museum.

BUILD A SKYSCRAPER

The first skyscrapers were built in the late 1800s and early 1900s. These tall buildings had frames made from iron or steel. Henry Bessemer invented a way to make steel fast and cheap enough that builders could use it for skyscrapers. This innovation made it possible for builders to make taller and taller structures.

How tall will your skyscraper be? What will hold up the weight of your skyscraper? Find the skyscraper in [American Enterprise](#) to learn more about factors that influence the business world.

CREATE AN EARTHQUAKE-RESISTANT STRUCTURE

No building is totally safe from earthquakes. But the right mix of strength and flexibility helps earthquake resistant structures stay standing during an earthquake. The biggest earthquake in North America hit at 5:36 p.m. on March 27, 1964, near Anchorage, Alaska. It is the second-biggest earthquake ever measured.

What will help your structure resist earthquakes? How long will your building resist a quake?

INVENT A FITNESS DEVICE

Exercise can make a body work better and be stronger. During the 1800s and early 1900s, people went to gyms and used ladders, ropes, parallel bars, and weights to exercise. In the early 1970s, inventor Arthur Jones began selling his Nautilus exercise machine. Now people around the world go to gyms and use his machine and others, like exercise bikes, treadmills, and stair-steppers.

What new fitness device will you invent? How will it benefit a person's health? Visit [American Stories](#) to see [Muhammad Ali's gloves](#) and [Apolo Ohno's ice skates](#).

CREATE AN ADAPTIVE TOOL

In Spark!Lab, we believe that everyone can build. Due to physical differences, some tools are hard to use for some people. For example, pliers might be hard to use for someone with arthritis. Someone without a limb may need a different type of shovel for digging. Some tools are designed to be easy for almost anyone to use. Other tools have been adapted to meet a person's specific needs.

What task will your adaptive tool perform? Who would benefit most from your invention? See a collection of [OXO tools](#) for the kitchen in [FOOD: Transforming the American Table, 1950–2000](#).

CREATE A PIECE OF CONSTRUCTION EQUIPMENT

Construction equipment shapes and reshapes the world around us. During the early and mid-1900s, people used machines and their own hard labor to build skyscrapers in New York, railroad tunnels in Washington, DC, and highways across the nation. As buildings get taller and tunnels get larger, innovators create new ways to shape our world.

What type of construction equipment will you invent? What does your equipment do and what innovative features did you include? Explore [road construction equipment patent models](#) in [America on the Move](#).

BUILD A RUBE GOLDBERG MACHINE

Rube Goldberg machines solve simple tasks in the most overcomplicated, inefficient, and fun ways possible. [Rube Goldberg](#) was an inventor and cartoonist. He lived during the "machine age" at the beginning of the 1900s. The complex gadgets of the era inspired his cartoons.

What simple task will your Rube Goldberg machine do? How many steps will you include?