

LIBERTY SCIENCE CENTER

# STEM

FEE-BASED VIRTUAL  
PROGRAM OFFERINGS

Spring 2020





As educators across the world have answered the call to provide their students with lessons and resources during these unprecedented times, Liberty Science Center has accepted the charge to provide support with high quality, accessible programming to meet instructional and professional development needs.

Contact us today to learn how LSC can help you bring these in-depth and interactive programs to your students. These courses are conducted as private sessions allowing for a richer experience, more targeted discourse, and increased engagement with LSC's educators.



**FEE-BASED VIRTUAL PROGRAM OFFERINGS SPRING 2020**

📍 222 Jersey City Boulevard, Jersey City, NJ 07305 📞 LSC.org 📞 201.253.1310 ✉ sales@lsc.org  
Liberty Science Center® is a nonprofit organization



## **GRADES PRE-K - 2**

### **Maple Seed Models (30 - 45 Minutes)**

Create your very own maple seed model out of paper, and explore how the maple seed has a special way of getting the space it needs to grow and survive.

✓ *Materials: Scissors, paper, optional paper clip or binder clip*

### **Ch-Ch-Ch-Changes (30 - 45 Minutes)**

Our planet is constantly being shaped by events that can happen very slowly over time, or quite suddenly. Using a homemade model to represent land and bodies of water, students will simulate how glaciers, avalanches, and mudslides can change the shape of the land around us.

✓ *Materials: Baking soda, vinegar, cup, plate*

### **Pollinators: Honey Bees (30 - 45 Minutes)**

Have you thanked a bee today? Pollinators provide an essential service to the ecosystem. At least a third of the world's agricultural crops depends on pollination provided by insects and other animals. Honey bees produce and store honey, but they also help to make other favorite foods. Design a pollination device that works just as hard as a busy bee.

✓ *Materials: One sheet of paper, plastic wrap, tape, plastic bag, aluminum foil*

## **GRADES 3 - 5**

### **Science of Flight and Aviation (30 - 45 Minutes)**

Learn about the concepts of flight and aviation and apply this knowledge through hands-on experiences like using flight experiments to design your own paper airplane.

✓ *Materials: Two sheets of paper, pen or pencil, optional printable worksheet*

### **Intro to Simple Machines: Solve Problems (30 - 45 Minutes)**

Figure out solutions to everyday challenges using simple machines made of common household materials.

✓ *Materials: Pencil, ruler, hardcover books, toys of different weights, optional printable worksheet*



#### **FEE-BASED VIRTUAL PROGRAM OFFERINGS SPRING 2020**

📍 222 Jersey City Boulevard, Jersey City, NJ 07305 | 🌐 LSC.org | 📞 201.253.1310 | ✉ sales@lsc.org  
Liberty Science Center® is a nonprofit organization





### **Simple Machines: Catapult (30 - 45 Minutes)**

Discover how simple machines are used to make work easier. Students will learn the various types of simple machines and combine several of them to build a catapult.

✓ *Materials: Rubber band, toilet paper tube, spoon, popsicle sticks, small pebbles or small marshmallows*

### **Force and Motion (30 - 45 Minutes)**

Become a scientist and use some unlikely tools to investigate the science behind Force and Motion.

✓ *Materials: Paper, pencil, any variety of non-battery operated toys, optional printable worksheet*

### **Renewable Energy (30 - 45 Minutes)**

While such nonrenewable energy sources as coal and oil dwindle, we need to look to other sources such as sun, wind, and water. Become a renewable energy architect and experiment with a variety of renewable energy resources.

✓ *Materials: Paper or optional printable worksheet*

### **Organizing Fossils (30 - 45 Minutes)**

Our virtual classroom will let you see fossils up-close. We'll learn to observe them, determine their makeup, and organize them by the geologic time periods when different species lived.

✓ *Materials: Paper or optional printable worksheet*

### **Chemistry of Candy (30-45 Minutes)**

Investigate chemistry with sweet delights to explore chemical and physical changes, then separate materials based on their properties.

✓ *Materials: Cup, water, Skittles or M&M's*

### **Wonders of the Night Sky (30 - 45 Minutes)**

This virtual planetarium program uses the night sky as a starting point. After exploring the brightest constellations and the planets visible in the current sky, we fly deep into space to explore planets and other celestial events close up.

### **The Solar System (30 - 45 Minutes)**

In this virtual planetarium show, learn where to find planets in the real night sky, as well as what makes a planet different from a star. Then we'll take a flight into our solar system to see the planets close up, the way NASA sees them.



#### **FEE-BASED VIRTUAL PROGRAM OFFERINGS SPRING 2020**

📍 222 Jersey City Boulevard, Jersey City, NJ 07305 | 🌐 LSC.org | 📞 201.253.1310 | ✉ sales@lsc.org  
Liberty Science Center® is a nonprofit organization



## **GRADES 6 - 8**

### **Forensic Science: Gotham Detective (45 - 60 Minutes)**

Conduct an investigation and analyze evidence to build a case against one of the city's notorious criminal masterminds before it's too late.

✓ *Materials: Online materials will be shared via Google Classroom*

### **Disease Transmission (30-45 Minutes)**

Using an online simulation, we'll learn how viruses travel through a population and what factors speed or slow their spread.

✓ *Materials: Simulation link (through NetLogo) will be shared during the course*

### **Moving Molecules (30 - 45 Minutes)**

Investigate thermal energy and particle motion. In an experiment with hot and cold substances, we show how molecules move differently depending on heat. Students can replicate the experiment at home.

✓ *Materials: Warm water, cold water, two cups, two colors of food coloring*

### **Classifying Organisms: Living or Not (30 - 45 Minutes)**

Using state-of-the-art microscopic images, we'll discover the characteristics of living things, investigate different types of single-celled and multicellular organisms, and make arguments supported by evidence to determine whether something is living or nonliving.

✓ *Materials: Paper or optional printable worksheet*

### **Wonders of the Night Sky (30 - 45 Minutes)**

This virtual planetarium program uses the night sky as a starting point. After exploring the brightest constellations and the planets visible in the current sky, we fly deep into space to explore planets and other celestial events close up.

### **The Solar System (30 - 45 Minutes)**

In this virtual planetarium show, learn where to find planets in the real night sky, as well as what makes a planet different from a star. Then we'll take a flight into our solar system to see the planets close up, the way NASA sees them.



#### **FEE-BASED VIRTUAL PROGRAM OFFERINGS SPRING 2020**

📍 222 Jersey City Boulevard, Jersey City, NJ 07305 📞 LSC.org 📞 201.253.1310 ✉ sales@lsc.org  
Liberty Science Center® is a nonprofit organization



### **Introduction to Game Design: Construct 3 (45 - 60 Minutes)**

Design custom characters with animations and behaviors by completing a crash course in Construct 3. This intuitive toolset is limited only by your creativity. This platform sets a foundation of computational thinking—an essential skill in today's tech-driven world.

✓ *Materials: Link will be provided to Construct 3, which runs in a web browser*

### **Digital Art Studio (30 - 45 Minutes)**

This intuitive S.T.E.M. toolset demonstrates how technology and art intersect. Explore color theory, lighting, and animation to create digital art or animation.

✓ *Materials: Link will be provided to PiskelApp, which runs in a web browser*

### **Introduction to Tinkercad (45 - 60 Minutes)**

Learn the basics of 3D design in this course. Students will use a popular online tool called Tinkercad to design their own creations.

✓ *Materials: Link will be provided to Tinkercad, which runs in a web browser*

### **Tinkercad Mission to Mars (45 - 60 Minutes)**

Can humans overcome Mars's harsh environment and live there one day? Design a habitat for life on Mars based on a topographic map that resembles a real Martian location.

✓ *Materials: Link will be provided to Tinkercad, which runs in a web browser*

### **Tinkercad Arduino Circuits (45 - 60 Minutes)**

Learn about circuitry and how to code for Arduino. This microcontroller is great for beginners but flexible enough to provide additional challenges for more knowledgeable students.

✓ *Materials: Link will be provided to Tinkercad, which runs in a web browser*

### **Tinkercad Block Coding (45 - 60 Minutes)**

Write code without typing: Simply drag and drop blocks together to make shapes. Reorder blocks to refine your design. Run the code and watch your creation come to life.

✓ *Materials: Link will be provided to Tinkercad, which runs in a web browser*





## **GRADES 9 - 12**

### **Forensic Science: Gotham Detective (45 - 60 Minutes)**

Conduct an investigation and analyze evidence to build a case against one of the city's notorious criminal masterminds before it's too late.

✓ *Materials: Will be shared via Google Classroom.*

### **Disease Transmission (30 - 45 Minutes)**

Using an online simulation, we'll learn how viruses travel through a population and what factors speed or slow their spread.

✓ *Materials: Simulation link (through NetLogo) will be shared during the course.*

### **Wonders of the Night Sky (30 - 45 Minutes)**

This virtual planetarium program uses the night sky as a starting point. After exploring the brightest constellations and the planets visible in the current sky, we fly deep into space to explore planets and other celestial events close up.

### **The Solar System (30 - 45 Minutes)**

In this virtual planetarium show, learn where to find planets in the real night sky, as well as what makes a planet different from a star. Then we'll take a flight into our solar system to see the planets close up, the way NASA sees them.

### **Introduction to Game Design: Construct 3 (45 - 60 Minutes)**

Design custom characters with animations and behaviors by completing a crash course in Construct 3. This intuitive toolset is limited only by your creativity. This platform sets a foundation of computational thinking—an essential skill in today's tech-driven world.

✓ *Materials: Link will be provided to Construct 3, which runs in a web browser*

### **Digital Art Studio (30 - 45 Minutes)**

This intuitive S.T.E.M. toolset demonstrates how technology and art intersect. Explore color theory, lighting, and animation to create digital art or animation.

✓ *Materials: Link will be provided to PiskelApp, which runs in a web browser*



#### **FEE-BASED VIRTUAL PROGRAM OFFERINGS SPRING 2020**

📍 222 Jersey City Boulevard, Jersey City, NJ 07305 📞 LSC.org 📞 201.253.1310 ✉ sales@lsc.org  
Liberty Science Center® is a nonprofit organization

## Introduction to Tinkercad (45 - 60 Minutes)

Learn the basics of 3D design in this course. Students will use a popular online tool called Tinkercad to design their own creations.

✓ Materials: Link will be provided to Tinkercad, which runs in a web browser

## Tinkercad Mission to Mars (45 - 60 Minutes)

Can humans overcome Mars's harsh environment and live there one day? Design a habitat for life on Mars based on a topographic map that resembles a real Martian location.

✓ Materials: Link will be provided to Tinkercad, which runs in a web browser

## Tinkercad Arduino Circuits (45 - 60 Minutes)

Learn about circuitry and how to code for Arduino. This microcontroller is great for beginners but flexible enough to provide additional challenges for more knowledgeable students.

✓ Materials: Link will be provided to Tinkercad, which runs in a web browser

## Tinkercad Block Coding (45 - 60 Minutes)

Write code without typing: Simply drag and drop blocks together to make shapes. Reorder blocks to refine your design. Run the code and watch your creation come to life.

✓ Materials: Link will be provided to Tinkercad, which runs in a web browser

# PROFESSIONAL DEVELOPMENT FOR TEACHERS

## STEM in Our Stories (60 Minutes)

### Grades Pre-K - 2

Bring STEAM into a busy early childhood classroom by adding it to storytime. We'll explore resources for inquiry-based learning and hands-on activities that go along with children's books.

## It's All in the Question (60 Minutes)

### Grades 3 - 8

How are questions important in the STEM learning environment? We have the answers! Explore different types of questions and effective strategies you can use in your lessons.

## Using the Zoom Platform Effectively (60 Minutes)

### Grades 3 - 8

LSC is here to help educators adapt to the new online learning environment. Using a sample STEM lesson, we'll discuss effective learning and teaching strategies on the online platform Zoom.



#### FEE-BASED VIRTUAL PROGRAM OFFERINGS SPRING 2020

222 Jersey City Boulevard, Jersey City, NJ 07305 | LSC.org | 201.253.1310 | sales@lsc.org  
Liberty Science Center® is a nonprofit organization