

ELEMENTARY SCHOOL STEM PATHWAY MODULE DESCRIPTIONS (8 or more completed in a training)

Pre-K/ Kindergarten

Using Boom Cards to Practice Skills and Teach the Standards!

Teachers will learn what Boom Cards are and how to use them to teach various standards! Teachers will explore free version/paid version options and register for the free version. Teachers will explore using Fast Play for diagnostic purposes and learn where to Find Boom Cards for free review, including instructor made Intro to Technology Boom Cards, and curricular boom cards. Teachers will be able to make their own for classrooms and district use and learn how to share. Emphasis will be on creating Boom Cards to learn more about the school community.

Introduction to Scratch Jr for Emergent Reader: Create and Program a Story

Teachers will incorporate Scratch Jr in a series of lessons designed to improve literacy skills in an emergent reader. Activities include Introducing programming; Following Directions; Writing code right to left; Sequencing; Storytelling; Design a character/adding sounds; Scene changing and directing your character like an author; Debugging - when your character doesn't listen; Timing; Repeating an action; You be the author-make your own story.

What Makes Someone a Community Hero?

Focus is on the school community and integration into current curriculum for PK, then the local community for K.

How Can We Teach People About the Weather in Our Community?

After completing the lessons, students will:

Recognize that they can learn about weather using their five senses.

Begin to build an understanding of basic weather concepts.

Gain experience in communicating results by drawing, writing, and talking about weather.

Understand that science involves asking questions and collecting and analyzing data.

Collect data to determine the weather.

Determine the best clothes to wear in various weather conditions. Create a weather guide.

Design a building to withstand various conditions.

The Art of Shapes- How Can We Make Art with the Shapes Around Us and Share with Others in Our Community?

In this project, students learn about the different geometric shapes in the world around them (e.g., rectangles, squares, trapezoids, etc.). They keep an artist's sketchbook to take note of the shapes and include ideas as to how to incorporate shapes in their art. Students write an artist's statement talking about their process and welcome visitors to the grand opening of their Shapes Gallery where they hold a meet the artist talk, answer questions, and share their pieces.

1ST GRADE

● **Using Boom Cards to Review and Teach the Standards!**

Same format as PK/K, but different grade/ content standards are addressed.

● **Introduction to Scratch Jr Coding for Readers**

Reinforces the skills taught in PK/K with more complexity.

● **Scratch Jr- Reinforcing Math and Literacy with Scratch Jr: Create Animations to Reinforce Uppercase and Lowercase Letters and Number Counting.**

Once familiar with Scratch Jr, students can make animations with Letters and Numbers as the Characters in order to aid in recognizing letters, matching upper- and lower-case letters, and counting objects. Teachers or older students can make animations for 1st graders, then they can make their own.

- **Using Code. Org to Learn to Program.**

This is a stand-alone programming unit. Students build games and complete tasks as they learn coding skills and computational thinking.

- **Making Claymation/ Papermation Videos in the Early Elementary Classroom**

Teachers will learn how to make their own Claymation or papermation videos, as well as students can create their own! Can be used with storytelling, creative “writing”, explaining scientific processes and functions, visualizing mathematical concepts such as fractions, recreating historical time periods and events, and demonstrating physical activities such as proper exercises and stretches.

- **What Makes Someone a Community Hero?**

Focus on the local community at the parish level as students explore what a hero is and what makes a hero.

- **How can we use Pushes and Pulls in Games and Work?**

This module helps familiarize teachers with activities promoting STEM. Students will examine, measure, and explain how pushes and pulls of various objects are used to produce and control motion.

- Students will analyze what they have already experienced and observed in past activities.
- Students explore the concepts of cause and effect regarding motion.
- Students will experiment in order to challenge their thinking about motion.
- Students will creatively think about their understanding of pushes and pull

- **Sound and Light**

In this unit, students will design and conduct investigations, make observations, and share their research with others as they explore light and sound and their properties, then use that knowledge to design a device that uses light or sound to solve the problem of communicating over distance.

- **How Can We Take Care of the Environment and Inspire Others to Help Us?” Designing Hamster Habitats**

Students will learn about animals’ basic needs and explore characteristics of two- and three- dimensional shapes before applying them to design an artificial hamster habitat to meet the needs of organisms.

- **Growing Milkweed for Butterflies**

Students learn about butterfly life cycles and grow Milkweed to create a butterfly habitat.

- **Make a business- Who Can Sell Out First?**

Students will create a product for the school population, then make a marketing pitch to the other students. Students can purchase the items with real or pretend money. The first to sell out wins.

- **Helping Emergency Workers with Toy Making-**

Students learn about emergencies and help firefighters and police by creating items to comfort young people who are in need.

- **Make stories come alive for kids in our community?**

Students retell stories to others in the community by videoing them and placing them on the website or the library site.

- **No Litter Campaign-**

Students learn about pollution and create a public campaign to prevent littering.

2ND GRADE

- **Once Upon a Code- Using Scratch for Characterization**

How can we use technology to teach about characterization? Students will use Scratch to develop characters with personalities (using thought and speech bubbles to “animate” and “narrate” a character’s thoughts and actions.)

- **Save the Bees!**

Bees are one of the primary pollinators for food sources on Earth, yet they are in danger of dying off. Learn more about why they are in danger and design a plan to help the bees survive!

- **Animal Adaptations**

How can we assess understanding of environments and biomes and animal adaptations? Students will create a new environment and a new animal with adaptations to survive in that environment as a culminating activity.

- **Camp Computation**

This module will teach addition and subtraction, counting coins, word problems, telling time, and measurement skills by using a camping trip project where students design and plan a camping trip for several of their friends or family members. Students complete a variety of activities using math. Students will budget for a camping trip (addition), purchase items in a “store” using coins and bills, measure different camping equipment using inches or centimeter, create a schedule of camping activities, and graph the number of animals seen on a hike.

- **What Do Plants Need to Grow?**

Students will watch a video and read a story about plants growing, then design an experiment to test their understanding with bean plants in the classroom and share their understanding. Students will make a data table and bar graph of their results, then share their results with others on the internet with a web page.

- **Our Town, USA**

How can we teach about responsibilities of citizens within a community? By designing, planning, and building a community using what we have learned about rights, responsibilities, producers, consumers, local government, and economics.

- **Lego STEM Kits.**

Teachers will learn how students can use the WEDO kits to narrate Aesop's Fable ‘THE LION AND THE MOUSE’ using the roaring lion they design from the pieces and program. (Additional training in science kits is also available with prior approval)

Teaching Coding in the Elementary School Setting

Teachers will be introduced to coding in the classroom using Code.org

3RD GRADE

● **Once Upon a Code- Using Scratch for Characterization, Dialogue, Retelling/ Summarizing a Story, or to Tell a Story.** Same format as used in 2nd grade, but different content standards are addressed.

● **Energy Efficient Housing**

What is energy efficiency? In this unit students will design, plan, and create an energy efficient house that is also sustainable.

● **Space Solutions Math for 3rd Grade**

How can we as astronauts, mathematicians, and scientists prepare to travel around the universe? Students start with a budget to follow as they select a crew to go on their space trip with them. Students can consider the pros and cons of bringing the different crew members on their mission. Next students must complete their astronaut training by choosing classes and making a schedule to follow. Students must help other astronauts as they shop and pack for the space mission. This involves counting coins, addition/subtraction, and word problems. Students measure the distance between the planets and answer questions about their measurements. Students will also plan out a habitat on the moon base for their crew using the exact same materials for each crew member and determine how many of each item they will need. They will create arrays using the materials.

● **Digital Story-telling**

Students will learn to use writing and planning skills in order to create a personal narrative and use digital storytelling to put that narrative into pictures.

● **Creating a GIF-Scene Development**

Teachers learn how to create a GIF from scratch, then use their knowledge to create visual aids for their classroom, as well as how to teach students to create GIFs. Students will learn how to create a gif to show a scene of their choice such as from a story, holiday, history lesson, or a math concept as requested by their teacher

● **Forces, Hovercrafts, and Magnets.**

Students investigate forces to learn about their effect on the motion of a toy. They design a hovercraft in order to see what affects its motion and create a data table and a graph as they investigate. Next, they explore the electrical and magnetic forces through centers, leading to students creating their own experiments on magnetism, gathering data, and sharing their results. Finally, students use the engineering design process to create a magnetic lock for their journal!

● **Magnet Maze Madness**

Students will work together to design and build a maze. They will use a pinball and a magnet to guide the ball through the maze. Students will explain how a magnet works and be able to discuss the properties of magnets.

● **The Louisiana Museum**

This unit will examine how the people and the physical geography of Louisiana have directly influenced each other over time. This will be done by creating a Louisiana Museum with various activities and exhibits exploring the standards for 3rd grade SS (asking and answering questions such as how have people changed the land to meet

Make a Digital Mosaic, Vision Board, and GIF

This lesson can be incorporated into any subject area. Students will learn how to create a mosaic picture digitally. They will create a digital vision board to help stay on task with their goals. Finally, students will learn how to create a simple GIF.

4TH GRADE

Once Upon a Code- Using Scratch to Retell/ Summarize a Story

Same format as used in prior grades, but different content standards are addressed.

Stop Motion Animations and Narrative Writing

This module uses a stop motion animation app such as Stop Motion Studio to photograph student characters and settings in order to retell a fairy tale or nursery rhyme by creating a unique ending or changing the point of view. Students learn how to create a storyboard and make a stop motion animation video including editing by adding voiceover and complementary music. Can also be used to tell a historical narrative, a science experiment, or even relate a math problem.

Energy and Engineering

This Module is an energy and engineering supplementary unit. Students will complete STEM activities using the Engineering Design Process to reinforce concepts of Potential Energy, Kinetic Energy, and Forces such as: Friction, Momentum, Gravity, and Inertia, as well as Simple Machines, electrical circuits, and conservation of energy and transfer of energy. Students will also use the Engineering Design Process to plan and design a solution to a human problem using plant and animal structures.

Microsoft or Google Workspace Training- Project Based

Teachers share lessons that they want to improve through the use of technology. These lessons are then modified to use the various tools found with the Microsoft or Google Platform. Facilitators provide information on various tools available for teachers. Teachers will be able to create a website and learn how to create a logo, in addition to other activities.

Can you Build a Hurricane Resistant Buildings?

Students will design a building that can withstand the impact of strong wind forces following the engineering design process, and test and redesign their designs using wind power.

Wind Lift- Energy and Turbines

Students build a windmill and test the energy it generates, discuss energy transfer and relate the speed of the wind blades to energy. Students modify the blades to improve function. Next, students use centers to show how energy can be transferred by sound, light, heat, and electricity. Finally, students build and test an electrical circuit that converts energy into other types of energy within a given time frame and from select materials

Earthquakes

In this unit students will investigate earthquakes including patterns of seismic waves, how seismic waves are measured (by building a seismograph measuring device) and design an Earthquake resistant building then test it by building a shake table.

Biomimicry

How can teachers teach about senses and survival? By using Biomimicry! Learn how plants and animals' designs are sustainable in nature and create your own solutions in order to survive.

The American Revolution- A Tale Of 2 Sides?

How can you teach different sides of the American Revolution? Use resources such as a classroom podcast to investigate through inquiry the question of "Did the American Revolution have more than two sides?"

5TH GRADE

Pixel Art Design

Teachers will learn how to create their own Pixel Art activities to use with students.

Once Upon a Code- Using Scratch to Tell a Story

Same format as used in prior grades, but different content standards are addressed.

Code World

Teachers learn the basics of Haskell and Code World in order to code various visual projects.

Stop Motion Animations and Narrative Writing

This module uses a stop motion animation app such as Stop Motion Studio to photograph student characters and settings in order to retell a fairy tale or nursery rhyme by creating a unique ending or changing the point of view. Students learn how to create a storyboard and make a stop motion animation video including editing by adding voiceover and complementary music. Can also be used to tell a historical narrative, a science experiment, or even relate a math problem. Similar to the 4th grade training but focuses on other standards.

Microbits In the Classroom

The microbit is a pocket-sized system that introduces you to how software and hardware work together with a cost around \$25.00 each. Students connect to a computer with internet and code the Microbits to perform various tasks or activities.

Vex IQ

Using Vex IQ Robotic Kits, Students learn how gear reductions affect drivetrain speed and torque by completing challenges. Students program their robots to test and compare gearing up vs. gearing down configurations. Students will also learn how to program sensors to complete missions. Can be used in competitions. Prices range around \$379-\$580 for a kit.

Digital Storytelling

Students will use Google Slides, WeVideo, or similar to tell digital stories based on various content areas. Students could create a visual report or virtual movie trailer to show what they have learned in math, ELA, or other content areas, rather than a typical report. Students create a storyboard, learn to video, and edit their movies, add sound, and other effects to their final products.

3D Printing

Students learn the basics of 3D design such as creating negative space, duplicating, rotating, and aligning objects utilizing TinkerCAD. Students will practice making a cookie cutter and name plate keychain.

Word Play

In this module students will explore the play of The Phantom Tollbooth and create sets and costumes culminating in a production/presentation of the play.

Teaching Fractions and Decimals with a Choice Board!

Students will use a choice board including a stock market project, designing a new playground for children in wheelchairs, and creating a new flavor of soda (recipes). In order to learn about fractions and decimals.

The Water Cycle

Students will partner with meteorologists and staff from a natural history museum to create an interactive video or exhibit that guides viewers/patrons through the water cycle and its effects on climate, erosion, etc.

Coasters, Contraptions, and Circuit Boards

How can you teach forces, energy transfer, and simple machines? By using marble roller coasters, Rube Goldberg machines (contraptions), and circuit cards! Students design, build and test these objects in order to explore 5th grade science standards and the engineering design process.

ECOSYSTEMS—Quadrat Sampling

Quadrats are rectangular frames used to mark out sample areas in order to gather data about the environmental qualities within those areas. In this project, students conduct a quadrat survey in order to investigate the health of a local ecosystem such as their school grounds or a nearby park. They use the data collected to calculate the abundance of different species as both a measure of density (unit rate) and of frequency (percentage). They analyze the health of the ecosystem (using ratios and percentages), either by focusing on an invasive species or by examining the biodiversity of the ecosystem. Students present their findings and discuss their implications in the form of a news article.

Golden Civilizations Exploration

Students use inquiry based research to create a museum exhibit (physical or digital) that showcases their assigned civilization's golden age and explain why it came to an end. The exhibits can be displayed at a community/school event and provide a summary of their conclusions. Resources could also include a digital museum exhibit. In addition, student teams are stranded on a deserted island and must create a civilization that accounts for survival mentally, physically, and emotionally.

Robotics Training

Learn how to use a Spike Prime Robot (Lego) to perform various tasks and projects. For class or after school program.

Pop Art

Use digital media to create Pop Art designs that can illustrate or tell a story.

Code.org Training

The Capitol Area Regional STEM Center is affiliated with Code.org and provides training to elementary schools K-5 through 1 day workshops. To schedule a workshop, please contact Nicole Foster at nfoster1@lsu.edu for further information.

Do you have a specific request for a SEM training? Let us Know! Contact us at info@lsupathways.org, or nfoster1@lsu.edu for assistance.



Gordon A. Cain Center

ELEMENTARY STEM MODULES

1. Materials

Internet access, one-to-one computer or tablet for use daily.

Reusable Hardware/Material Material is for 1 class in each grade from PK-5 (7 classes total)	Recommended Unit	Cost/Unit
Various reusable material and hardware for projects	1 per classroom	\$1500
Consumables Pk-5		
Various consumables for projects	1 per classroom	\$500

*Complete supply list can be found [here](#)

2. Required software, networking access, and access to LSU servers

Students and teachers will access the module materials through Google Drive.

3. Required teacher collaborations

Teachers will communicate with LSU instructors via emails, apps hosted on the LSU servers, and the band.us app. We ask that teachers share sample student work with their designated LSU Pathway Point-of-Contact.

4. Required administration of course content, pre/post test, and research instruments

All required materials and instruments will be either posted in the LSU servers, Google Drive, or their location announced via email.

5. Course Work

Implementation of the STEM modules in the classroom is at the discretion of the teacher. We encourage teachers to implement as many modules as possible to maximize student exposure to high quality STEM content.