NKU | **CINSAM:** Center for Integrative Natural Science and Mathematics

STEM2U Spring 2025
Schedule & Lesson Details

Date/Times	Activity & Description	Materials Needed for Activity	Standards Connection
February 12 9:15 - 10:15 am EST 2:00 - 3:00 pm EST	**Bridge to Safety** Students explore how wildlife crossings can promote safety for both animals and humans. They will design and construct a model bridge that provides a safe path for animals to cross busy areas, considering real-world challenges like durability and habitat needs. Through hands-on problem-solving, students will develop critical thinking and engineering skills while learning about conservation and environmental stewardship.	**Per group:** - 2 pieces of paper - 3 rubber bands - 4 pipe cleaners - 10 mailing labels (or 1 roll of scotch tape) - 10 toothpicks - 10 straws - scissors - ruler - a stack of books (for testing the bridge) - small plastic or stuffed animals (for testing the bridge)	**DCI:** - LS4.D Biodiversity and Humans - ETS1.B Developing Possible Solutions - LS2.C Ecosystem Dynamics, Functioning, and Resilience **SEP:** Constructing Explanations and Designing Solutions **CCC:** Stability and Changer
February 19	**No Live STEM2U**		

February 26
9:15 - 10:15 am EST
2:00 - 3:00 pm EST
	Space Shelters
	
	While space travel is growing, humans must find a way to live safely on other planets without risking harmful exposure to UV rays. Students will explore designs to keep space travelers safe from direct UV rays.
		Per student:
		- 1 pipe cleaner
		- UV beads (to put on pipe cleaner to make space person)
		
		Per group:
		- UV light source (UV flashlight or direct sunlight)
		- Various craft materials:
		  ○ cardboard
		  ○ aluminum foil
		  ○ craft sticks
		  ○ index cards
		  ○ newspaper
			DCI:
			- PS4.A Wave Properties
			- PS4.B Electromagnetic Radiation
			
			SEP:
			- Asking Questions and Defining Problems
			- Planning and Carrying Out Investigations
			- Constructing Explanations and Designing Solutions
			
			CCC: Patterns

DCI = Disciplinary Core Ideas
SEP = Science and Engineering Practices
CCC = Crosscutting Concepts
3-5 ETS1 = 3-5 Engineering Design

Date/Times	Activity & Description	Materials Needed for Activity	Standards Connection
		○ construction paper ○ tape ○ pencil and paper	
March 5 9:15 - 10:15 am EST 2:00 - 3:00 pm EST	**Make it Stick** Students hop into this sticky situation feet first as they design and test a new formula for an adhesive. They will learn about mixtures and solutions as they compare and analyze the data from their investigation.	**Per student or group:** - 5-10 index cards - pencil and paper - salt - flour - cornstarch - baking soda - plastic spoon - plastic cups - dried beans - water - teaspoon measuring spoon - timer	**DCI:** PS1.A Structure and Properties of Matter **SEP:** Planning and Carrying Out Investigations **CCC:** Cause and Effect **3-5-ETS1-2:** Engineering Design
March 12 9:15 - 10:15 am EST 2:00 - 3:00 pm EST	**Hold the Pie Challenge** Celebrate Pie Day with a creative engineering twist! Instead of just eating pies, students will design and construct their own pies using provided materials. Next, they'll rise to the challenge of building a freestanding structure as tall as possible to support their pie on top, without attaching it to the structure. This activity encourages creativity, problem-solving, and teamwork while exploring concepts	**Per student or group:** - Pie materials: ○ 1 paper plate ○ 1 package of pom-poms ○ glue ○ crayons or markers - Structure materials: ○ 6 paper straws ○ 4 pipe cleaners ○ 4 craft sticks ○ 3 index cards ○ 2 sheets of paper ○ 1 cardboard tube	**DCI:** ETS1.B Developing Possible Solutions **SEP:** Using Mathematics and Computational Thinking **CCC:** Scale Proportion and Quantity

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	like balance, stability, and design.	○ 12 inches of tape	
March 19 9:15 - 10:15 am EST 2:00 - 3:00 pm EST	**Coding with Cups** Students will work to demonstrate their skills on the greatest cup stacking challenge while adhering to the criteria and constraints given to them. They will also dive into beginner-level unplugged coding!	**Per student or group:** - 6 plastic cups - rubber band - 36 inches of string or 4 pipe cleaners	**DCI:** PS4.C Information Technologies and Instrumentation **SEP:** Analyzing and Interpreting Data **CCC:** Patterns
March 26	**No Live STEM2U**		
April 2 9:15 - 10:15 am EST 2:00 - 3:00 pm EST	**Looms and Coding** In this hands-on STEM lesson, students will discover the fascinating connection between traditional weaving looms and coding principles. They will construct their own looms and explore how patterns in weaving resemble the algorithms and sequences used in computer programming. By weaving their first project, students will combine creativity with problem-solving while deepening their understanding of technology and history.	**Per group:** - cardboard for creating loom - yarn of one or more colors	**DCI:** PS4.C Information Technologies and Instrumentation **SEP:** Analyzing and Interpreting Data **CCC:** Patterns
April 9	**Hand Pollinators**	**Per student:**	**DCI:**

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9:15 - 10:15 am EST
2:00 - 3:00 pm EST
	Students will design and build a hand pollinator using selected materials. The pollinators will compete to see which one can carry the most "pollen" to a flower.	- small plate of colored juice mix (Kool-Aid or lemonade)
		
		- Flower Materials:
		  ○ coffee filter
		  ○ markers
		  ○ spray bottle with water
		  ○ 5 cotton balls
		  ○ glue
		
		- Pollen Collector Materials:
		  ○ jumbo craft stick
		  ○ 2 ft of masking tape
		  ○ pom-poms
		  ○ Q-tips
			- LS4.D Biodiversity and Humans
			- ETS1.B Developing Possible Solutions
			
			SEP: Constructing explanations and designing solutions
			
			CCC: Structure and Function

April 16 9:15 - 10:15 am EST 2:00 - 3:00 pm EST	**Paper Plate Greenhouse** This week, students will explore seed germination by testing different materials, such as soil, cotton, or paper towels, to determine which supports growth best. They can also experiment with a variety of seed types to compare germination rates or combine both approaches for a more in-depth investigation. This hands-on project fosters curiosity and critical thinking while teaching fundamental concepts of plant biology and experimental design.	**Per student or group:** - paper plates - plastic bags - yarn - lima beans (or other seeds that sprout quickly) - paper towels - cotton balls - copy paper - water - paper - scissors - art supplies (optional) - window suction cups with hooks (for hanging the greenhouses)	**DCI:** - LS1.A Structure and Function - LS1.B Growth **SEP:** - Developing and using models - Planning and Carrying Out Investigations **CCC:** Structure and Function

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April 23 9:15 - 10:15 am EST 2:00 - 3:00 pm EST	**Inspector Detector: Magnetic Battlefield Finders** Students will build their own Magnetic Battlefield Finders after learning all about the awesome invisible force magnets have! Their partners will try to hide magnets among other items in the battlefield to test the strength and design of each Magnetic Battlefield Finder.	**Per partner group:** - manilla file folder - 2 grid sheets (emailed) - 1-2 strong small magnets - 1-2 other small magnets - tape - 3-4 small non-magnetic items (Examples could include: pencil erasers, mini dominoes, small marbles, rubber bands, tiny game pieces, non-magnetic metal pieces – anything small enough to fit in the grid pieces.) **Each student** will need access to the following for the Magnet Inspector Detector Devices: - strong magnets - tape - craft sticks - yarn or string - craft materials - cardboard - pipe cleaners - other crafting/building materials **Per student:** - Student Data Sheet (emailed)	**DCI:** PS2.B: Types of Interactions - Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. **SEP:** Asking questions and defining problems - Define a simple problem that can be solved through the development of a new or improved object or tool. **CCC:** Interdependence of Science, Engineering, and Technology - Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. **3-5-ETS1-3:** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

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