What are STEM Enrichments?

STEM Enrichment sessions enhance core instruction for elementary and middle school students and teachers in hard-to-teach concepts. All instruction is aligned with the competencies and objectives outlined nationally and by the state of North Carolina. North Carolina School of Science and Mathematics offers live interactive programming and do-it-yourself lessons. Live sessions are scheduled interactive opportunities that supplement classroom curriculum with hands-on activities. Do-it-yourself enrichments provide guidances, teaching materials, and videos that allow for flexible, asynchronous learning experiences.

Do It Yourself Enrichments

Box Problem Level 1 Grades 5-7 Math
Box Problem Level 2, Grades 8-9 Math
Box Problem Level 3, Grades 10-11
Forces & Motion, Grade 3-5 Science
Magnetic Effects, Grade 3-4 Science
Sherlock Holmes, Grade 3-4 Science
Solid, Liquid, Gas, Grade 3-5 Science

Student leaders teaching youth

Student Instructors Developing Enrichments, or SIDE, is a student work service, leadership, and volunteer opportunity. Residential, online, and distance education students at North Carolina School of Science and Mathematics develop and teach STEM enrichment lessons for elementary, middle, and high school students across the state.

Using interactive videoconferencing technologies, the SIDE leaders get first-hand experience with live, on-camera communication. Perhaps most importantly, the SIDE leaders gain valuable experience developing and teaching content that is engaging and accessible.

ABOUT NCSSM

North Carolina School of Science and Mathematics is the nation’s first public residential high school specializing in science, technology, engineering, and math. Through a residential and online program for high school juniors and seniors, summer programs, and course offerings to schools across the state, we challenge and inspire North Carolina’s youth.

ncssm.edu/STEMenrichments
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<tr>
<th><strong>Available enrichments</strong></th>
<th><strong>See full descriptions and NC essential standards at ncssm.edu/STEm enrichments</strong></th>
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<tr>
<td><strong>Artificial Heart</strong></td>
<td>Gr. 5-9  The heart and circulatory system. Make an artificial heart out of everyday household materials.</td>
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<tr>
<td><strong>Astronomy</strong></td>
<td>Gr. 5-7   Explore mass, weight, and how gravity of a planet affects weight. Students will learn about surface area, volume and density conversions.</td>
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<tr>
<td><strong>Balance &amp; Motion</strong></td>
<td>Gr. 1-3   Gravity and symmetry; explore balanced and unbalanced systems. Discover ways to manipulate the center of mass of an object.</td>
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<tr>
<td><strong>Bean Balance</strong></td>
<td>Gr. 1-3   Number comparisons, greater than, less than, equal to. Explore algebraic methods &amp; concepts, variables and isolation.</td>
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<tr>
<td><strong>Bits &amp; Binary Code</strong></td>
<td>Gr. 6-9   Binary number systems and how they apply to computers and digital technology. Write numbers and letters in binary code; decode binary numbers.</td>
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<tr>
<td><strong>Body Movements: Bones, Muscles, Joints</strong></td>
<td>Gr. 5-9   Biomechanics and how the human body uses bones and muscles to create movement.</td>
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<tr>
<td><strong>Breathing: The Lungs</strong></td>
<td>Gr. 5-9   How human lungs react to exhalation and inhalation, as well as the relationships between vital capacity, expiratory reserve, and tidal volume.</td>
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<tr>
<td><strong>Decimal Bingo</strong></td>
<td>Gr. 2     Use the game of bingo to explore place value and multiplying decimals by whole numbers and decimals by decimals.</td>
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<td><strong>Dice &amp; Randomness</strong></td>
<td>Gr. 7     Hands-on determination of mathematical &quot;facts,&quot; followed by discussion of theory. Use a die to &quot;compare&quot; short term randomness for obtaining a certain number versus long-term probabilities.</td>
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<tr>
<td><strong>Earth’s Spheres</strong></td>
<td>Gr. 6-9   Earth systems and how biosphere, hydrosphere, geosphere and atmosphere are interconnected.</td>
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<tr>
<td><strong>Earth’s Temperatures</strong></td>
<td>Gr. 5-9   Predict approximate temperatures and compare different temperatures based on location. Understand factors that influence climate and temperature.</td>
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<tr>
<td><strong>EGC Electrodes &amp; Consumables</strong></td>
<td>Gr. 6-9   Learn the roles of a biomedical engineer and the use of ECG electrodes and millimeters; build a low-cost electrode.</td>
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<td><strong>Electromagnets</strong></td>
<td>Gr. 5-9   Electromagnets and their application in the real world. Students will have an opportunity to build their own electromagnet.</td>
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<td><strong>Engineering Catapults</strong></td>
<td>Gr. 6-9   Engineering design process, the design of catapults, and apply technological design steps to build a catapult that uses allocated materials to launch an object.</td>
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<tr>
<td><strong>Equation Exploration</strong></td>
<td>Gr. 8     Students will solve equations with one variable by simplifying the equation. Solve linear equations and solve a puzzle based on the solutions.</td>
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<td><strong>Estimation Station</strong></td>
<td>Gr. 3-4   Reasonable estimation using hands-on experiments and refresh addition and subtraction skills.</td>
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<tr>
<td><strong>Exploring Sound</strong></td>
<td>Gr. 2     Sound, vibrations, pitch, frequency, and sound waves. Learn how an object must vibrate to make sound; difference between magnitude and pitch.</td>
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<td><strong>Finding Fibonacci</strong></td>
<td>Gr. 8-9   Students will have a basic understanding of the Fibonacci Sequence and how it is present in nature.</td>
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<td><strong>Force, Motion, &amp; Air Resistance</strong></td>
<td>Gr. 6-9   Effects of gravity, force, motion, air resistance, and terminal speed on the acceleration of a falling object. Materials for group of 3-4 students.</td>
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<td><strong>Forces &amp; Motion</strong></td>
<td>Gr. 3-5   Force, inertia, friction, balanced forces, and unbalanced forces. Build a vehicle that uses the force of air to move.</td>
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<tr>
<td><strong>Fractals &amp; M&amp;Ms</strong></td>
<td>Gr. 3-4   Fractals, numerators, denominators, ratios. Fun With Cells Gr. 5-9 Create model of a cell using everyday objects. Develop understanding of the cell and its parts.</td>
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<td><strong>Fun With Cells</strong></td>
<td>Gr. 5-7   Learn about the cell and its anatomy. Students will create a model of a cell using everyday objects.</td>
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<tr>
<td><strong>Genetic Diseases</strong></td>
<td>Gr. 5-9   Genetics and an introduction to three genetic diseases in relation to what they do, how they’re caused, and how they’re treated.</td>
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<td><strong>Genetics: DNA</strong></td>
<td>Gr. 3-4   Explore genetics and DNA. Gain a basic understanding of the application and function of DNA. Students will extract DNA from common household items.</td>
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<tr>
<td><strong>Geometry: Surface Area &amp; Volume</strong></td>
<td>Gr. 5-7   Understand surface area and volume. Students will create hexagonal and discover how surface area and volume interact with each other.</td>
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<tr>
<td><strong>Hydraulic Arm</strong></td>
<td>Gr. 5-9   Physiology and movements of the arm and basic bioengineering principles. Engineer an &quot;arm&quot; to explore and test the concepts they learn.</td>
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<td><strong>Hydraulic Hand</strong></td>
<td>Gr. 5-9   Learn function and structure of prosthetics, how hydraulics work in artificial limbs, and why they are used in the prosthetic hand.</td>
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<tr>
<td><strong>Hydrodynamics</strong></td>
<td>Gr. 3-5   Learn the concepts of buoyancy and water displacement. Infer changes in speed and direction resulting from external forces. Students will engineer a boat using the engineering design process.</td>
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<td><strong>Multiplication Station</strong></td>
<td>Gr. 3   Interpret products of a whole number as the number of objects in each group. Use dominos to practice interpretation of multiplication.</td>
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<tr>
<td><strong>Neuroscience: The Brain</strong></td>
<td>Gr. 5-9  Anatomy and processes behind the nervous system, focusing on the brain.</td>
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<tr>
<td><strong>Physics of Flight</strong></td>
<td>Gr. 5-9   Dynamics of flight and the engineering design process. Make an aircraft that will maintain flight for the longest period of time.</td>
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<tr>
<td><strong>Prosthetic Engineers</strong></td>
<td>Gr. 6-9   Engineer a model prosthetic lower leg using various materials.</td>
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<td><strong>Rolling Equations</strong></td>
<td>Gr. 6     Write, read and evaluate expressions where letters stand for numbers. Students will create expressions using die and find the solutions.</td>
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<tr>
<td><strong>Sherlock Holmes</strong></td>
<td>Gr. 3-4   Observation, memory, and critical thinking skills. Also learn about hard evidence that detectives use, fingerprint types, and see their own fingerprints.</td>
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<td><strong>Simple Circuits</strong></td>
<td>Gr. 2-4   Students will construct parallel and series circuits and explain how each type of circuit works. Students will describe the qualities that define good and poor conductors of electricity and will list at least three of each type of conductor.</td>
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<td><strong>Solid, Liquid, Gas</strong></td>
<td>Gr. 3-5   The student will learn about three different states of matter (solids, liquids and gasses) and the concept of mass. The hands-on activities involve bagging matter, saturating solutions, and creating and observing a chemical overreaction.</td>
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<tr>
<td><strong>Statistics &amp; M&amp;M's</strong></td>
<td>Gr. 6-7   Describe data form M&amp;M's using range and various measures of central tendency including mean, median and mode. Learn the distinction between quantitative and qualitative data.</td>
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<td><strong>Waiting For Heads</strong></td>
<td>Gr. 3-4   Students will learn about decimals, fractions and percentages. Students will use dice to learn about whole numbers and fractions as well as convert fractions into percentages. They will gain a basic understanding of decimal placement.</td>
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<td><strong>Water Cycle</strong></td>
<td>Gr. 5     Learn about the water or hydrologic cycle. Explore the three stages of the water cycle: evaporation, condensation and precipitation.</td>
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<tr>
<td><strong>What’s Nano</strong></td>
<td>Gr. 8     Explore nanotechnology and nanoscience. Use scientific notation and determine units of appropriate size to measure very large or small quantities.</td>
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<td><strong>Box Problem Level I</strong></td>
<td>Gr. 5-7   Students will learn how to make a box from a single sheet of folded paper. You will calculate volume and investigate how to make your paper box with the largest volume possible.</td>
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<tr>
<td><strong>Box Problem Level II</strong></td>
<td>Gr. 8-9   Students will learn how to make a box from a single sheet of folded paper. You will calculate volume and investigate how to make your paper box with the largest volume possible.</td>
</tr>
<tr>
<td><strong>Box Problem Level I</strong></td>
<td>Gr. 10-11 Students will learn how to make a box from a single sheet of folded paper. You will calculate volume and investigate how to make your paper box with the largest volume possible.</td>
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