

STEM Summer Learning Programs

Overview of Summer Learning Programs

Summer learning programs are designed to provide students with additional opportunities for learning and growing during the summer months. Districts and schools should strive to create opportunities for all students to access a summer learning program.

Overview of STEM

STEM is an acronym that stands for Science, Technology, Engineering, and Mathematics. The Oklahoma State Department of Education is dedicated to preparing students for their futures, and a high-quality STEM education will help prepare students for post-secondary science, math, engineering, computer science, and technology opportunities.

As the United States Department of Education states, in an ever-changing, increasingly complex world, it's more important than ever that our nation's youth are prepared to bring knowledge and skills to solve problems, make sense of information, and know how to gather and evaluate evidence to make decisions. These are the kinds of skills that students develop in science, technology, engineering, and math. If we want a nation where our future leaders, neighbors, and workers have the ability to understand and solve some of the complex challenges of today and tomorrow, and to meet the demands of the dynamic and evolving workforce, building students' skills, content knowledge, and fluency in STEM fields is essential. We must also make sure that, no matter where children live, they have access to quality learning environments (<https://www.ed.gov/stem>).

In Oklahoma, STEM education includes the individual disciplines of mathematics, computer science, and science as well as the purposeful integration and application of mathematics and science with technology and engineering. Students must receive quality foundations in each of their STEM subjects while also engaging in both STEM appreciation and STEM integration experiences throughout their PK-12 academic journeys.

STEM Appreciation	STEM Integration
Contains one or more of the STEM subject content areas isolated or loosely connected in a lesson or activity.	Connects concept(s) and practice(s) across STEM disciplines.
Contains activities related to STEM concepts, but they may not be related to all grade-level content standards.	Contains all facets of STEM disciplines in activities related to grade-appropriate content standards.



Whether students are experiencing the individual disciplines, STEM appreciation, or STEM integration experiences, high-quality STEM education is driven by problem-solving, discovery, exploratory project/problem-based learning, and student-centered development of ideas and solutions.

STEM in Summer Learning Programs

STEM appreciation and integration experiences allow students to connect science, technology, computer science, engineering, and mathematics experiences to real-world experiences and potential postsecondary opportunities. STEM experiences also enable opportunities for developing communication skills, collaborating with others, and engaging with (and potentially solving) a variety of real-world problems.

Considerations for STEM Summer Learning Programs

Plan for equitable access. This includes accessibility, participation, materials and supplies, scheduling of instructional time, instructional delivery, and engagement of all disciplines for all students.

Make time for collaboration. Teachers will need opportunities to collaborate in order to plan a cohesive summer learning program. Students will need opportunities to be social and collaborate during their summer learning program experiences.

Create a safe and positive culture. Building a safe and positive culture is key in order for students to participate in an environment where they feel comfortable expressing themselves, taking risks, and engaging in the program experiences.

Offer choice. Students should be offered choice as often as possible to exercise their imaginations and creativity.

Consider a variety of experiences. When designing the summer learning program, consider providing a balance of STEM subject area, appreciation, and integration experiences. Review the resources listed below, and use the [“STEM as a Sound Board” Rubric](#) to help evaluate the type of learning opportunities you are making available to your students.

[Additional considerations for STEM programs.](#)

[Learn more about other state/district efforts for STEM Summer Learning Programs.](#)



Resources for STEM Subject-Area Summer Learning Programs (PK-12)

The following free, open resources will help schools and districts plan for high-quality STEM summer learning programs:

Science	<ul style="list-style-type: none"> ● Oklahoma Academic Standards for Science ● OKSci Curriculum Frameworks ● Investigating Phenomena: Guidance for Home and School Connections ● Phenomenal Gather-Reason-Communicate Lessons
Technology/ Computer Science	<ul style="list-style-type: none"> ● Oklahoma Academic Standards for Computer Science ● Code.org Open Curriculum ● Scratch Act 1 Open Curriculum ● Experiments with Google Coding Projects
Engineering	<ul style="list-style-type: none"> ● Oklahoma Academic Standards for Science: Science and Engineering Practices (page 5 of PDF) ● Teach Engineering: Open Curriculum ● Makerspace Playbook
Mathematics	<ul style="list-style-type: none"> ● Oklahoma Academic Standards for Mathematics ● OKMath Curriculum Frameworks ● Exploding Dots Series (available in non-digital format) ● Mathematics Assessment Project ● Math Circles Overview and Series of Activities ● Week of Inspirational Math
Additional STEM Resources	<ul style="list-style-type: none"> ● OSDE Curriculum and Instruction Website ● Oklahoma Distance Learning Resource Database (includes activities/programs suitable for in-person enrichment) ● Imagine Math is currently free for all fifth and eighth grade students in Oklahoma. In addition to the Math 3+ supplemental math program, teachers will also have access to a series of STEM summer projects.

STEM Subject Area, Appreciation, and Integration: Community and National Websites/Programs

Working with your local community organizations can provide real-world STEM applications and opportunities for students that they'll remember for a lifetime. Even if students are unable to physically attend a museum or park, many of the following community opportunities offer traveling exhibits or virtual experiences. (Admission and/or programming fees may apply for the following opportunities.)

Community STEM Opportunities	
Camp Trivera (Oklahoma City)	Camp Trivera is not only a camp for Girl Scouts to study STEM, it offers full-day field trip experiences in Oklahoma City.
Discovery Lab (Tulsa*)	Discovery Lab's hands-on learning enriches Oklahoma Academic Standards by building on students' interests and strengths.
The Gathering Place (Tulsa)	The Gathering Place offers a variety of educational programming, at-home resources, and field trip opportunities.
Leonardo's Children's Museum (Enid)	Leonardo's Children's Museum offers science, technology, engineering, art, and math opportunities.
Museum of Osteology (Moore*)	Museum of Osteology offers virtual field trips, in-person events, and a traveling museum experience.
National Weather Museum and Science Center (Norman*)	The National Weather Museum and Science Center offers in-building and traveling museum experiences.
OK College Start Summer Academies (Across Oklahoma)	This website includes a list of STEM Camps for students entering Grades 8-12.
Oklahoma Aquarium (Jenks)	The aquarium offers in-person and virtual field trips and free educational resources.
Oklahoma Department of Wildlife Outdoor Education (Across Oklahoma)	The Oklahoma Department of Wildlife offers free and public outdoor programs and resources to Oklahoma families and schools.
Oklahoma Museums (Across Oklahoma)	This website provides a downloadable list of all museums in Oklahoma. Many of these museums offer STEM subject-area, appreciation, and integration experiences.
Oklahoma State Parks (Across Oklahoma)	Nature offers many opportunities to explore and engage with STEM. Find a state park near you to discover educational opportunities.

Sam Noble Museum (Norman*)	The Sam Noble Museum in Norman offers a variety of STEM experiences and resources, including at the museum or remotely.
Science Museum Oklahoma (OKC*)	Science Museum Oklahoma offers a variety of experiences and resources, including at the museum or remotely.
Stafford Air and Space Museum (Weatherford)	This museum houses over an acre of exhibits representing the evolution of aviation and space flight.
Tulsa Regional STEM Alliance (Tulsa and surrounding areas)	Tulsa Regional STEM Alliance offers field trip opportunities, STEM kits, and resources for students, teachers, schools, and districts in the Tulsa area.
Zoo: (Oklahoma City and Tulsa)	Both the Oklahoma City and Tulsa Zoos offer educational experiences while staying outdoors.
*Offers traveling exhibits and opportunities	

Additional National STEM Opportunities	
Exploring by the Seat of Your Pants	Bring science, exploration, adventure, and conservation to students with Exploring by the Seat of Your Pants through virtual field trips and interactions with experts.
Nepris	Nepris is a free resource to allow you to connect industry professionals in STEM to your classroom virtually. The speakers can be live, or you can find pre-recorded talks.
Skype a Scientist	Skype a Scientist is a way to bring a scientist into your classroom virtually. They offer printables, activities, and real scientists doing real research to answer students' questions.
STEM-Works	This website provides a variety of resources to help motivate students to learn about science, technology, engineering, and math.
The National Museum of Computing	This museum's website offers free virtual field trips and resources.
The National Museum of Mathematics (MoMath)	MoMath is based in New York City and offers an augmented reality math series, a gallery of math art, virtual field trips, and free mathematical puzzles!
Smithsonian Air and Space Museum Virtual Field Trips	Enjoy online experiences with the National Smithsonian Museum that have been designed to engage and excite learners, while aligning to their educational needs.
Young Scientist Lab	This website offers virtual field trips, interactives, and teacher resources.



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