

Quality STEM Implementation Guide

Louisiana K-12 Schools

October 2024

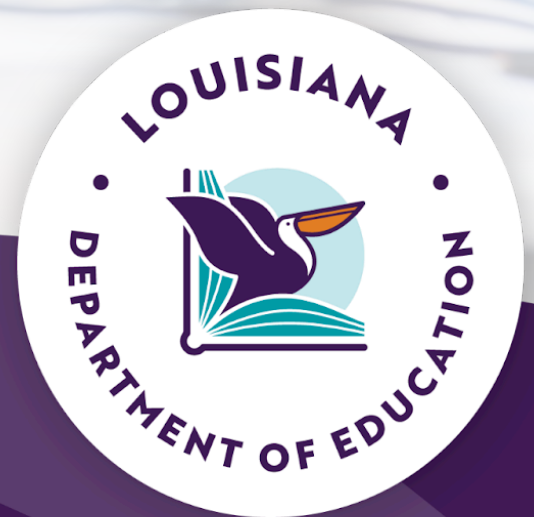


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STEM Implementation Guidance

Overview

STEM (Science, Technology, Engineering, and Mathematics) encompasses the knowledge, skills, and ways of investigating and making sense of our world that are essential to each of the STEM disciplines (from National Research Council, 2014):

- **Science** refers to both the body of knowledge that explains our natural world as well as the practices we engage in to build this knowledge.
- **Technology** is any human-designed tool or process that solves a problem.
- **Engineering** is a body of knowledge about the design and creation of technology as well as the processes and practices we engage in to solve problems.
- **Mathematics** is the study of patterns and relationships among quantities, numbers, and space, including logical arguments and claims.

Students who engage in quality STEM experiences are better equipped to respond to life's challenges and make informed decisions as empowered members of society. Engineering design offers students an opportunity to develop their problem-solving abilities, which in turn supports the foundations of math problem-solving and algebraic processes. Scientific thinking and understanding are useful tools, not just for scientists and other STEM professionals, but for our students as they approach complex challenges in their everyday lives. Quality STEM experiences employ the skills and practices required in all STEM disciplines and share deep connections to core math and science instruction.

Best Practices and Approach

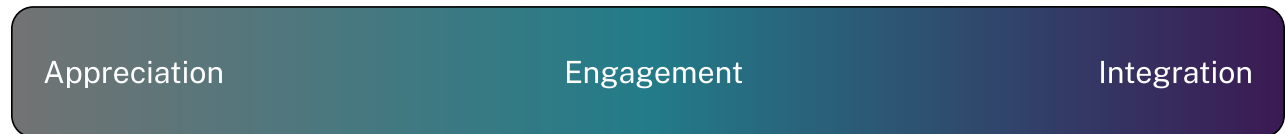
Quality STEM experiences are an essential part of a well-rounded education and should leverage integrated learning across disciplines through student-centered investigation and design experiences that connect to the real world, hold relevance to students' daily lives, inspire engagement and joy, build confidence and belonging, and cultivate key competencies necessary to persist and succeed, not only in STEM disciplines but in life.

Key Features of Quality STEM Education

1. All students have **access** to quality STEM learning experiences.
2. STEM instruction is a **continuous spectrum** of experiences across multiple disciplines from K-12.
3. **Student-centered** investigation and design drive learning outcomes for students.
4. **Career-connected** STEM experiences expose students to future opportunities, partnerships with industry, and possibilities in STEM extending beyond the classroom.
5. **Disciplinary practices** in science, technology, engineering, and mathematics are leveraged appropriately, driving engineering design and innovative technology integration.

Continuum of STEM Implementation

Schools and systems have many choices related to curriculum and program implementation. Our goal is to help schools and systems elevate [STEM education](#) to better serve the students within Louisiana in a way that makes the most sense to each school and system. Since STEM can look very different from one school or system to the next, the implementation continuum is one way to visualize the range of STEM experiences available to students.



At one end of the continuum, a school or system may engage in STEM appreciation. This may include an awareness of STEM and limited opportunities for students to engage in authentic STEM experiences such as clubs, singular events, or isolated projects. In the middle of the continuum, a school or system may engage in STEM. This may include high-quality materials used in core science or repeated experiences such as an elective STEM class or specialized coursework. At the far end of the spectrum, a school or system may fully integrate STEM experiences. Integration in STEM may be observed as a school or system providing educational experiences daily that allow for the seamless integration of disciplines. The STEM disciplines are rarely, if ever, viewed in isolation, and the immersion in STEM literacy through disciplinary practices is evident in student work and the school environment.

STEM Literacy

STEM literacy consists of the concepts, processes, and ways of thinking that can be integrated and applied to design a solution to real-world problems. STEM-literate students are more capable of addressing obstacles encountered and making informed decisions as active members of society. While disciplinary literacies within science, technology, engineering, and mathematics may include specific disciplinary language, processes, and unique practices, STEM literacy refers to the intersection and integration of the skills and practices required in all STEM disciplines.

Each discipline within STEM — Science, Technology, Engineering, and Mathematics — can be considered individually as shown in the table below.

Table 1. Disciplinary Literacy

Discipline	Overview of Disciplinary Literacy
Science Literacy	A scientifically literate student uses scientific knowledge to identify questions, acquire new knowledge, explain scientific phenomena, and draw evidence-based conclusions about science-related issues.
Technology Literacy	A technologically literate student understands what technology is, why it is created and improved, and how it can change the way people live and work. This includes the ability to use technology effectively, efficiently, and responsibly to communicate and solve problems.

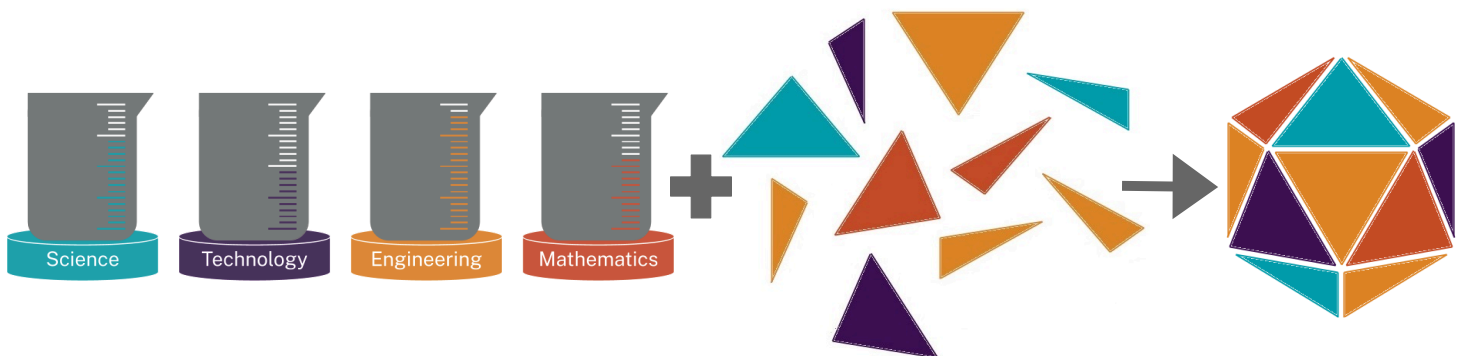
Discipline	Overview of Disciplinary Literacy
Engineering Literacy	An engineering-literate student understands how technologies are developed via the engineering design process. This incorporates the ability to systematically and creatively apply scientific and mathematical principles to practical ends, such as the design, manufacture, and operation of efficient and economical structures, machines, processes, and systems.
Mathematics Literacy	A mathematically literate student can identify and understand the role mathematics plays in the world, make well-founded judgments, and engage with mathematics in ways that meet the needs of an individual's life as a constructive, concerned, and reflective citizen.

STEM literacy is not solely a conglomeration of the four silos that comprise STEM. Instead, it is the ability to take the content and practices of the individual disciplinary literacies and integrate them to solve relevant and authentic problems, as shown visually in [Model 1](#).

STEM literacy is the set of shared capabilities required in all STEM disciplines:

- Identifying questions and problems related to STEM
- Understanding characteristic features of STEM disciplines
- Willingness to engage in STEM-related issues as a concerned and reflective citizen (Zollman, 2012)

Model 1. STEM Literacy Visual



using disciplinary content + integration of disciplinary practices → ability to solve relevant and authentic problems

Quality STEM Resources

STEM Resource Considerations

Below are important considerations when selecting a STEM resource to meet the needs of your district, school, or classroom:

- Time
 - How much time is available for students to participate in quality STEM activities?
 - Daily, as part of a year-long course that is a part of students' daily schedules
 - Weekly, during an after-school or summer learning program
 - Monthly, or once a semester, during a school-sponsored STEM Night
 - Intermittently throughout the year, embedded within a class period
- Cost and Funding
 - What is the total cost for teachers participating in the quality STEM experiences?
 - Professional learning or development
 - Teacher access licenses
 - Training registration costs
 - What is the total cost of materials needed for purchase for the number of students participating in the quality STEM experiences?
 - Hands-on, students materials
 - Consumables and non-consumables
 - Digital devices or other technology
 - Student access codes
 - Platform usage
 - How much money is available to purchase materials for both students and the teacher?
 - Federal or grant funding
 - Classroom/school donations
 - Partnerships with companies, corporations, or local businesses
 - [QSM Grants](#)
- Resources
 - What resources are available to set up these quality STEM experiences for students?
 - Human resources - STEM teacher, teacher/staff members, parent volunteers
 - Local resources - industry and business partners, [LASTEM Regional Centers](#)

K-8 STEM Resources

Engaging with quality K-8 STEM resources starting in primary and middle school helps build a strong foundation for future learning throughout high school and equips students with essential skills for the modern world, such as critical thinking, creativity, and problem-solving. Additionally, early exposure to STEM can inspire a lifelong interest in STEM fields and open doors to a wide range of career opportunities. The K-8 resources listed in the table below have been reviewed by Louisiana STEM [Teacher Leader Advisors](#) (TLAs). Louisiana STEM TLAs analyze a variety of STEM resources that must meet the minimum eligibility requirements for review, as well as provide sufficient evidence of the [key features of quality STEM](#). The table of resources below is in no way an exhaustive list. Additional resources will continue to be added upon further review.

K-8 STEM Resource Table

STEM Resource	Brief Overview			
Engineering is Elementary/ Youth Engineering Solutions	Engineering is Elementary (EiE)/Youth Engineering Solutions (YES) is available through the Museum of Science. EiE/YES offers access to teacher- and student-facing lesson resources, in both English and Spanish, which integrate engineering and computer science through the application of the Engineering Design Process.			
Suggested Grade Levels	Access to Resources	Resource Implementation	Pre-Packaged Materials	Professional Learning
PreK - 8	Free	<ul style="list-style-type: none"> → In-School Programs → Classroom Integration → Afterschool Programs → Summer Program → STEM Camps → STEM Events → Home Activities 	Available for Purchase	Available for a cost
STEM Resource	Brief Overview			
LEGO® Education	LEGO® Education offers students hands-on learning experiences that engage students in interactive, problem-solving activities through the use of LEGO® robotics and coding. Students use the Engineering Design Process to learn STEM concepts through real-world applications and critical thinking tasks.			
Suggested Grade Levels	Access to Resources	Resource Implementation	Pre-Packaged Materials	Professional Learning
PreK - 8	Free	<ul style="list-style-type: none"> → In-School Programs → Classroom Integration → Afterschool Programs → Summer Programs → STEM Camps → STEM Events → Competitions 	Available for Purchase	Available for a cost; Free online community

STEM Resource	Brief Overview			
TeachEngineering	TeachEngineering offers access to units, lessons, and maker challenge activities across K-12. Students have opportunities within activities to iterate upon designs as a part of the Engineering Design Process and engage in Science and Engineering Practices through modeling.			
Suggested Grade Levels	Access to Resources	Resource Implementation	Pre-Packaged Materials	Professional Learning
2 - 12	Free	<ul style="list-style-type: none"> → In-School Programs → Classroom Integration → Afterschool Programs → Summer Programs → STEM Camps → STEM Events → Home Activities 	Not Available	Limited Virtual PD
STEM Resource	Brief Overview			
CYBER.ORG	Cyber.org offers access to self-paced or teacher-taught cybersecurity lesson modules and materials. Video clips with knowledge checks help students navigate cyber safety. Unplugged lesson activities are available for lower grade-level classrooms with limited access to technology.			
Suggested Grade Levels	Access to Resources	Resource Implementation	Pre-Packaged Materials	Professional Learning
K - 12	Free	<ul style="list-style-type: none"> → In-School Programs → Classroom Integration → Afterschool Programs → Summer Programs → STEM Camps → Competitions 	Not Applicable	Available for no cost

9-12 STEM Resources

High School STEM Renaissance Pathways

The Louisiana STEM Renaissance Pathways are a component of the [Jump Start Initiative](#), the state’s innovative career and technical education (CTE) program. The [STEM Renaissance Pathways](#) aim to equip [Louisiana students](#) with the skills needed to pursue a STEM degree in college or enter the workforce with certifications in high-wage career fields. These pathways cater to students aiming for either a Louisiana [TOPS Tech Diploma](#) or [TOPS University Diploma](#).

The Louisiana STEM Pathway Initiative continues to grow and add new opportunities to meet the technological, educational, and career-guided needs of students. The LDOE STEM team collaborates with school systems and [Pathway providers](#) to enhance the opportunities each year. Contact STEM@la.gov with inquiries about new courses or questions about current opportunities.

STEM Renaissance Pathway Descriptions

Computing and Cybersecurity

The Louisiana [Computing and Cybersecurity Pathway](#) allows students to engage in a program of study that combines computer science, cybersecurity, and mathematics through project-based learning. Students will be able to apply computational thinking techniques in many different STEM disciplines and demonstrate proficiency in computing in many settings. Students will explore the implications of technology usage in social interactions, learn how to protect systems from possible cyberattacks, and create interactive websites and applications. Students will discuss the ethics of advancements in robotics and artificial intelligence as they consider the value of true autonomous devices. They will build complex systems capable of multiple sensory inputs and advanced logic structures. Pathway coursework prepares TOPS University and Jump Start TOPS Tech diploma-seeking students to compete in the 21st century by immersing them in the fundamentals of the field, as well as its impacts and applications in the workplace.

Digital Design and Emergent Media

The Louisiana [Digital Design and Emergent Media Certification Pathway](#) is designed with a 21st-century approach to media production. It centers on developing the skills and creativity for producing digital media from the initial assets through to the final presentation. The pathway incorporates the multiple STEM disciplines to address the constantly transforming field of digital media by enabling: digital storytelling – no matter the media; production skills training and certification in a variety of media types; programming experience specializing in web and digital media; and engagement in emergent media practice culminating in group-based projects, exhibition/performance, and portfolio development.

Environmental Protection and Sustainability

The Louisiana [Environmental Protection and Sustainability Pathway](#) has been established to provide both TOPS University and TOPS Tech diploma-seeking high school students with the knowledge and skills necessary to pursue careers connected to the natural environment. The ultimate goal of this pathway is to allow students the opportunity to understand the weather, geology, and ecology that are specific to our region. Students will understand the careers available to them in various settings to prepare for the sustainability of natural resources and the future of our state's citizens.

Pre-Engineering

The Louisiana [Pre-Engineering Pathway](#) provides a pre-engineering program for both TOPS University and TOPS Tech diploma-seeking high school students. Through hands-on projects and interaction with industry professionals, the curriculum prepares students to compete in the 21st century by engaging them in understanding the fundamentals of engineering in the classroom and the workplace. Students will understand the careers available to them in the field of engineering as well as learn key skills such as teamwork, oral and written technical communication, and work ethic that will serve them well whether they pursue an advanced degree or immediately join the workforce.

Pre-Healthcare/Pre-Veterinary

The Louisiana [Pre-Healthcare & Pre-Veterinary Pathway](#) provides a program for both TOPS University and TOPS Tech diploma-seeking high school students. Through hands-on projects and interaction with industry professionals, the curriculum prepares students to compete in the 21st century by engaging them in understanding the fundamentals of STEM practices in the classroom and the workplace. Students will understand the careers available to them in the medical field and learn key skills such as teamwork, oral and written technical communication, and work ethic that will serve them well whether they pursue an advanced degree or immediately join the workforce.

STEM Renaissance Pathway Provider Information

Pathway Provider Direct Contact	STEM Pathway Courses Provided				
	Computing and Cybersecurity	Digital Design and Emergent Media	Environmental Protection and Sustainability	Pre- Engineering	Pre-Healthcare/ Pre-Veterinary
LSU STEM High School Pathways	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
stempathways@lsu.edu					
Project Lead The Way (PLTW)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Schedule a consultation					
CYBER.ORG	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
info@cyber.org					
Xavier University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Dr. Kristi Rapp					

STEM Resource One-Pagers

Features of STEM Resource One-Pagers.

STEM discipline emphasis (bolded)

Engineering is Elementary/Youth Engineering Solutions

→ SCIENCE TECHNOLOGY **ENGINEERING** MATHEMATICS COMPUTER SCIENCE

Overview

[Engineering is Elementary \(EiE\)/Youth Engineering Solutions \(YES\)](#), curricula available through the Museum of Science, builds STEM literacy through the application of the Engineering Design Process and real-world problem-solving. Free digital unit resources, complete with science, mathematics, and STEM career connections, are available in grades PreK through 8.

Lagniappe

[PLANETS](#), through a partnership with NASA, also offers free unit resources that can be utilized in grades 3-8 as a supplement or as stand alone units of study. [Family resources](#) are also available for no cost to bridge connections from school to home and expand opportunities in STEM by building positive STEM identities for students.

Professional Learning

- Custom [Professional Learning](#) available at a cost
- Introductory Workshops
- Teacher Educator Institutes
- Webinars

Available Materials

- Free access to digital resources

Teacher-Facing Resources	Student-Facing Resources
<ul style="list-style-type: none"> ◦ Teacher guides ◦ Teacher slides ◦ Preparation videos ◦ Lesson plans 	<ul style="list-style-type: none"> ◦ Student engineering notebooks ◦ Illustrated stories ◦ Print materials ◦ English and Spanish versions

- Pre-packaged kits, as well as refill consumables, are available for purchase

Resource Implementation

- In-school STEM programs
- Classroom integration
- Afterschool programs
- Summer Learning Programs
- STEM camps
- STEM events
- [Home activities](#)

STEM Renaissance Pathway Alignment



Suggested grade levels (shaded)

- PK
- K
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9-12

Areas each resource can be implemented

Indicates correlation of resource to specific 9-12 STEM Pathway(s)

Engineering is Elementary/Youth Engineering Solutions

SCIENCE

TECHNOLOGY

ENGINEERING

MATHEMATICS

COMPUTER SCIENCE

Overview

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Professional Learning

- Custom [Professional Learning](#) available at a cost
- Introductory Workshops
- Teacher Educator Institutes
- Webinars

Available Materials

- Free access to digital resources

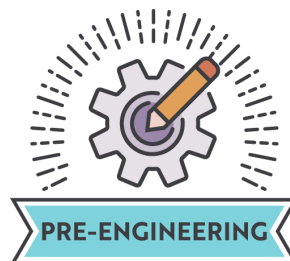
Teacher-Facing Resources	Student-Facing Resources
<ul style="list-style-type: none">○ Teacher guides○ Teacher slides○ Preparation videos○ Lesson plans	<ul style="list-style-type: none">○ Student engineering notebooks○ Illustrated stories○ Print materials○ English and Spanish versions

- Pre-packaged kits, as well as refill consumables, are available for purchase

Resource Implementation

- In-school STEM programs
- Classroom integration
- Afterschool programs
- Summer Learning Programs
- STEM camps
- STEM events
- [Home activities](#)

STEM Renaissance Pathway Alignment



PK

K

1

2

3

4

5

6

7

8

9-12

LEGO® Education

SCIENCE

TECHNOLOGY

ENGINEERING

MATHEMATICS

COMPUTER SCIENCE

Overview

[LEGO® Education](#) integrates engineering and computer science using LEGO® blocks, robots, and coding to construct models involving real-world applications. Students take a hands-on approach to critical thinking, problem-solving, collaboration, and fostering creativity. Students work together to design, build, and test solutions using the Engineering Design Process. Free digital resources are available for grades PreK through 8, including resources for retired LEGO® Education products.

Lagniappe

LEGO® Education offers insight on different [opportunities and resources](#) that can be utilized by leaders and teachers to provide STEM programs at schools. LEGO® Education also offers an [online location](#) to browse and share educator-created resources with each other, including cross-curricular lesson plans, how-to guides, worksheets, and projects.

Professional Learning

- [Professional Learning](#) available at a cost
- In-person and virtual facilitated learning
- Professional coaching options
- Free [LEGO® Education Community](#)

Available Materials

- Free access to digital resources

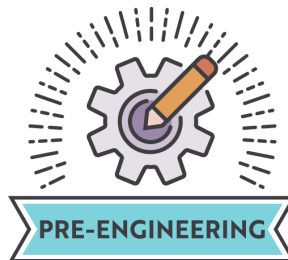
Teacher-Facing Resources	Student-Facing Resources
<ul style="list-style-type: none">○ Curriculum guides○ Lesson plans○ Instructional videos	<ul style="list-style-type: none">○ LEGO® blocks, robots, programming tools (in kits)○ Activity worksheets○ Activity cards

- Pre-packaged kits, as well as refill consumables, are available for purchase
- Most LEGO® sets require student access to a digital device

Resource Implementation

- In-school STEM programs
- Classroom integration
- Afterschool programs
- [Summer Learning Programs](#)
- STEM camps
- STEM events
- [State](#) and [national competitions](#)

STEM Renaissance Pathway Alignment



PK

K

1

2

3

4

5

6

7

8

9-12

TeachEngineering

SCIENCE

TECHNOLOGY

ENGINEERING

MATHEMATICS

COMPUTER SCIENCE

Overview

[TeachEngineering](#) provides units, lessons, and activities that are connected to math and science standards and support the [National Academy of Engineering's](#) “habits of mind.” A search tool allows easy access to materials based on grade level, standards alignment, duration, and subject area. Utilizing the Engineering Design Process, each activity allows students opportunities to iterate upon designs, explore engineering careers, and engage in Science and Engineering Practices through modeling.

Lagniappe

Maker Challenges allow students the opportunity to immerse themselves in the Engineering Design Process in order to solve real-world problems. Most of the challenges can be scaled down depending on the grade level needed. Though some Maker Challenges only need a couple of hours, several challenges could be done over the course of a week-long STEM camp.

Professional Learning

- [Virtual Workshops](#)

Available Materials

- Free access to digital resources

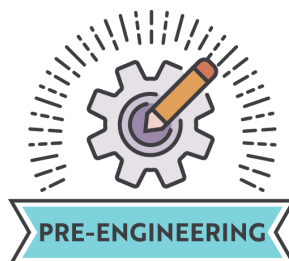
Teacher-Facing Resources	Student-Facing Resources
<ul style="list-style-type: none">○ Unit/lesson overview○ Lesson plans○ Assessment rubrics○ Lesson extensions/scaling	<ul style="list-style-type: none">○ Activity worksheets○ Activity instructions○ Informational videos

- Pre-packaged kits are not available for purchase, but most materials needed for lessons can be easily obtained

Resource Implementation

- In-school STEM programs
- Classroom integration
- Afterschool programs
- Summer Learning Programs
- STEM camps
- STEM events
- Home activities

STEM Renaissance Pathway Alignment



PK

K

1

2

3

4

5

6

7

8

9-12

CYBER.ORG

SCIENCE

TECHNOLOGY

ENGINEERING

MATHEMATICS

COMPUTER SCIENCE

Overview

[CYBER.ORG](#) offers a variety of lessons in cybersecurity through a series of grade-level identified modules. Materials and lessons are shared in a format that can be self-paced, class-led, or taught by an instructor. Video clips with knowledge checks are utilized to help students navigate cyber safety. Other units include, but are not limited to Coding Fundamentals and Computational Thinking. Curriculum materials are available in both English and Spanish with free sign-in.

Lagniappe

CYBER.ORG's Range Activities is a collection of stand-alone lessons that any educator can implement in their classroom to provide hands-on cybersecurity experiences to their students. A cyber range is a virtual lab environment where students are able to simulate cybersecurity scenarios in a safe, protected online environment as they explore the back end of IT systems used by today's industries. The [CYBER.ORG Range](#) is a free cyber range for all US K-12 educators. All educators can [request access](#) to the CYBER.ORG range.

Professional Learning

- Free virtual or in-person [professional development](#)
- Self-paced or virtual [workshops](#)

Available Materials

- Free access to digital resources

Teacher-Facing Resources	Student-Facing Resources
<ul style="list-style-type: none">○ Teacher guides○ Teacher slides○ Lesson plans	<ul style="list-style-type: none">○ PowerPoint slides○ Student handouts○ English and Spanish versions

- Most lessons require student access to a digital device, although unplugged activities are available in the lower grades

Resource Implementation

- In-school STEM programs
- Classroom integration
- Afterschool programs
- Summer Learning Programs
- STEM camps
- [Home activities](#)
- [Nationwide competition](#)

STEM Renaissance Pathway Alignment



PK

K

1

2

3

4

5

6

7

8

9-12

STEM Awards, Competitions, and Clubs

In addition to course offerings, STEM awards, competitions, and clubs enhance students' exposure to STEM to build 21st-century competencies needed to solve challenges in their everyday lives. The tables below include resources intended to serve as an example of quality STEM awards, competitions, and [clubs](#) appropriate for STEM learning and are in no way an exhaustive list. If there are additional resources a school or school system would like added to the lists below, email STEM@la.gov.

STEM Awards

Award	Description
Cognia School or System of Distinction	Schools or systems may be awarded the Cognia School/Systems of Distinction award after demonstrating excellence in meeting Cognia Performance Standards . Cognia's STEM Certification may be earned by schools that demonstrate a strong and effective STEM focus.
ITEEA STEM School of Excellence	ITEEA , International Technology and Engineering Educators Association, recognizes schools that demonstrate outstanding leadership in the field of STEM education as STEM Schools of Excellence . Recognized schools undergo a rigorous application process requiring detailed documentation to demonstrate a strong Integrative STEM program.
Green Ribbon Schools	The U.S. Department of Education Green Ribbon Schools (ED-GRS) is a public engagement initiative for school sustainability that is structured as a federal recognition award. By highlighting schools, districts, postsecondary institutions, and early learning centers' cost-saving, health promoting, and performance-enhancing sustainability practices, ED-GRS celebrates these institutions and brings more attention to their work. Additional resources can be found in the Green Strides School Sustainability Resource Hub .

Interscholastic STEM Competitions

Name of Competition	Description
Louisiana 4-H SeaPerch Challenge	SeaPerch is an innovative underwater robotics program that guides students to build an underwater remotely operated vehicle (ROV). The SeaPerch Challenge is a regionally supported event hosted by Louisiana 4-H in which teams will tackle elements that showcase STEM, problem solving, and teamwork skills alongside a supportive community of mentors and enthusiasts.
Make:able	This is an assistive technology 3D design and print challenge. Students use 3D printers to create their designs to impact someone in their community.

Name of Competition	Description
Louisiana Science and Engineering Fairs Region I Region II Region III Region IV Region V Region VI Region VII Region VIII Region IX Region X	Science and Engineering fairs are conducted at the local, regional, state, and national levels. Louisiana has ten Science and Engineering Fair regions to serve students in public, private, parochial, charter, and home schools. Students compete by division and the top qualifier goes to the state competition held in Baton Rouge, Louisiana. If a student wins in their state category, they may then advance to the National Fair for Junior Division (Grades 6-8) and the International Fair for the Senior Division (Grades 9-12).
FIRST® LEGO® League Challenge Robotics Competitions	FIRST® LEGO® League offers regional tournaments and championships where teams compete with their robots. Some teams earn an invitation to the FIRST® LEGO® League World Festival as part of the FIRST® Championship, where teams from all over the world meet and compete. There are various opportunities for teams composed of students from pre-K to grade 8.
Microsoft Imagine Cup	The Microsoft Imagine Cup, a global software and game design competition hosted by Microsoft, allows teams to create and build technology to solve the world's problems. This no-fee competition is open to all age groups.
You Be The Chemist Challenge	This free competition, sponsored by the Chemical Educational Foundation, for groups of 3-4 students in grades 5-8, can be completed either virtually or in person. Regional, state, and national winners will be named and winners at the national level are eligible to compete for scholarships.
Louisiana Regional Science Bowl	The National Science Bowl® (NSB) is a highly competitive “Jeopardy style” science and math education academic event among teams of high school and middle school students from all over the country. Regional and national events encourage student involvement in math and science activities of importance to the Department of Energy and the nation. The five-member, state-winning team and their coach are awarded a four-day all expense paid trip to Washington D.C.
National 4-H STEM Challenge	4-H STEM program equips young people (grades K-12) with the skills they need to succeed in life and are available through local clubs, schools, and grant-funded programs. Focus areas include computer science, robotics, aerospace, physics, chemistry, financial literacy, entrepreneurship, and veterinary science. 4-H programs use hands-on activities in robotics, computer science, and electrical engineering to teach problem solving, creative and critical thinking, and inspire kids to explore engineering and technology. The 4-H STEM Challenge, formerly known as National Youth Science Day (NYSD), is an annual initiative to inspire kids everywhere to take an interest in STEM topics through hands-on learning.

Name of Competition	Description
Vex Robotics	<p>VEX IQ Robotics Competition is played on a rectangular field involving two robots competing as an alliance in 60 second long teamwork matches, working collaboratively to score points. Teams also compete in the Robot Skills Challenge where one robot takes the field to score as many points as possible. Teams consist of students who plan, build, and drive a robot for a given competition.</p>
eCyberMission	<p>Sponsored by the Army Educational Outreach Program, students in grades 6-9 participate in a mission to use STEM techniques and practices to investigate and/or solve a local community problem in teams of 2-4. First place winners at the state level receive a \$500 savings bond per student. First place regional winners receive an additional \$1,500 in bonds and a paid trip to the finals. 1st place national winners receive an additional \$3,000 in bonds.</p>
Toshiba/NSTA Exploravision	<p>The Toshiba/NSTA Exploravision competition is designed to help students in grades K-12 develop problem-solving, critical-thinking, and collaboration skills. To participate, students must imagine and produce a system or a technology with the potential to solve the problems of the future. Students tackle real issues and envision viable solutions that could make a difference.</p>
Louisiana High School Rally Association	<p>The Louisiana High School Rally Association (LHSRA) is a voluntary, non-profit, educational association of middle and junior units of a school, home schools, and senior high schools that are recognized by the State Department of Louisiana and the colleges and universities that coordinate the district and state competitions each year. Students compete in regional and state competitions in various academic science and math disciplines. Students who place in each area are eligible for scholarships.</p>
Future City Competition by Discovery Education	<p>The Future City competition is an international team challenge where students research, design, and build cities that showcase a solution to a citywide sustainability issue. The topic changes each year and can include stormwater management, public spaces, green energy, age-related issues, and more. Teams of students in grades 6-8 with an educator or mentor as a coach may compete and utilize resources available online to guide the build and competition deliverables.</p>
Junior Science and Humanities Symposium (JSHS)	<p>JSHS encourages high school students to conduct original research in the fields of science, technology, engineering, and mathematics (STEM) and publicly recognizes students for outstanding achievement. JSHS aims to widen the pool of trained talent prepared to conduct research and development vital to our nation by connecting students, their teachers, and research professionals at affiliated symposia and rewarding research excellence. Students must first participate in their regional symposium to compete for selection to present at the national symposium each year.</p>

STEM Club or Student Organization

The clubs and organizations listed below are associated with a national or international organization focused on STEM.

Name of Club or Organization	Description
National STEM Honor Society	<p>NSTEM Chapters are school-based organizations that enrich the educational experience of all student chapter members. Chapters can only be started by a school, and each school has its own unique Chapter and Director. In addition, each Chapter is led by an Advisor who is often the school’s “STEM Champion.” There is an annual fee for an entire Chapter (elementary, middle, high school, or college). The National STEM Honor Society™ (NSTEM™) has established minimum annual requirements for student members including GPA (STEM classes only), classroom STEM hours, and enrichment hours.</p>
Technology Student Association	<p>The Technology Student Association (TSA) is a national career and technical student organization engaged in science, technology, engineering, and mathematics. TSA’s intracurricular program includes competitions and leadership activities. TSA has chapters in more than 2,000 schools throughout the country. Students have opportunities to compete in national and regional events and may apply for scholarships and awards.</p>
CSTA Computer Honor Society	<p>CSTA Computer Honor Society’s mission is to cultivate thriving environments for student success in Computer Science (CS) for grades 9-12. Schools must have a teacher who is a CSTA+ member and offer at least one CS course. Students who are members must have at least an 80% B or 3.0 in their CS coursework. Fees are required to start or renew the club.</p>
Mu Alpha Theta National High School Mathematics Honor Society	<p>Mu Alpha Theta is for students in grades 9-12 interested in mathematics. There is a \$25 chapter fee and a fee of \$10 per member to have this club. Reduced membership fees of \$5 per student are available for Title I schools. There are regional, state, and national competitions available for clubs to participate. Scholarships and grants, awards, and honor cords are available to students. The Louisiana chapter has an annual state convention for clubs each year.</p>
Science National Honor Society	<p>The Science National Honor Society was founded in 2001 with the idea of gathering students and scientists together to explore career opportunities beyond high school. The initial charter fee is \$300 with an annual \$75 per year renewal fee. Students must have an all subject 3.0 unweighted system GPA. The students must be 3.5 out of 4.0 overall in their science coursework. Honor chords, awards, and scholarships are available to students.</p>