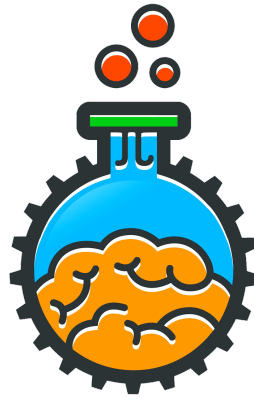


STEM FUSE

STEM=IT Series

Standard Alignment



The STEM:IT Series

Supplemental STEM Curriculum (Grades K-12)

STEM:IT Elementary (K-5)

Description: STEM:IT Elementary is an all-in-one solution to incorporate challenge-based learning, coding, and 3D modeling into your classroom. With 24 STEM:IT Challenges, 24 coding lessons, and 40 3D modeling projects, students will gain vital 21st Century Skills and solve problems.

Standards: The standards utilized in this curriculum include:

- ISTE 2016 Standards for Students
- Common Core Technology Standards
- Next Generation Science & Engineering Standards

To view these standards, [click here](#) to scroll to the section within this document.

STEM:IT Middle School (6-8)

Description: STEM:IT Middle School is a supplemental solution designed to add STEM skills and challenges to a variety of subjects. Students will integrate various core subjects to complete 20 real world challenges. Each challenge contains a career focus and 3D modeling project.

Standards: The standards utilized in this curriculum include:

- ISTE 2016 Standards for Students
- Common Core Technology Standards
- Next Generation Science & Engineering Standards

To view these standards, [click here](#) to scroll to the section within this document.

STEM:IT High School (9-12)

Description: STEM:IT High School is a supplemental program solution to add STEM skills and challenges to a variety of subjects. Students will integrate various core subjects to complete 20 real world challenges. Each challenge contains a career focus and 3D modeling project.

Standards: The standards utilized in this curriculum include:

- ISTE 2016 Standards for Students
- Common Core Technology Standards
- Next Generation Science & Engineering Standards

To view these standards, [click here](#) to scroll to the section within this document.





ISTE Technology Standards

The International Society for Technology in Education (**ISTE**) is a nonprofit organization that serves educators interested in better use of technology in education. The ISTE Student Standards - 2016 provide a framework for technology education for K-12 application. ISTE standards are applied throughout all STEM Fuse curriculum to infuse 21st Century Learning into our learning content.

1. Empowered Learner

- *Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:*
- Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
 - Build networks and customize their learning environments in ways that support the learning process.
 - Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
 - Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

2. Digital Citizen

- *Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. Students:*
- Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
 - Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
 - Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
 - Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

3. Knowledge Constructor

- *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:*
- Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
 - Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.
 - Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
 - Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

4. Innovative Designer

- *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:*
- Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
 - Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
 - Develop, test and refine prototypes as part of a cyclical design process.
 - Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

5. Computational Thinker

- *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:*
- Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
 - Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
 - Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
 - Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. Creative Communicator

- *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:*
- Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
 - Create original works or responsibly repurpose or remix digital resources into new creations.
 - Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
 - Publish or present content that customizes the message and medium for their intended audiences.

7. Global Collaborator

- *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. Students:*
- Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
 - Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
 - Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
 - Explore local and global issues and use collaborative technologies to work with others to investigate solutions.





Common Core K-12 Technical Standards

Common Core State Standards (CCSS) includes important digital and technological standards throughout the Math and English Language Arts (including Literacy in History/Social Studies, Science, & Technical Subjects) standards. STEM Fuse utilizes these standards in addition to building math, reading, writing, and speaking foundational skills throughout our STEM curriculum.

Kindergarten through 5th Grade

- **RI 5, RI 7** Evaluate teacher-selected or self-selected Internet resources in terms of their usefulness for research.
- **RI 5, RI 7** Use age appropriate technologies to locate, collect, organize content from media collection for specific purposes, citing sources.
- **RI 7** Use content specific technology tools (e.g. environmental probes, sensors, and measuring devices, simulations) to gather and analyze data.
- **W 6** Work collaboratively with other online students under teacher supervision.
- **W 6, W 10, SL 2, SL 5** Create projects that use various forms of graphics, audio, and video (with proper citations) to communicate ideas.

6th Grade through 12th Grade

- **F, SMP 5, RI 7** Use spreadsheets to calculate, graph, organize, and present data in a variety of real-world settings and choose the most appropriate type to represent given data.
- **G, SMP 5** Draw two and three dimensional geometric shapes using a variety of technology skills.
- **EE, A, F, SP, SMP 5, W 8, SL 5** Explain and demonstrate how specialized technology tools can be used for problem solving, decision making, and creativity in all subject areas (e.g., simulation software, environmental probes, CAD, GIS, dynamic geometric software, graphing calculators).
- **SL 5** Strategically use digital media to enhance understanding.
- **RI 5, RI 7, SMP 3** Explain how technology can support communication and collaboration, personal and professional productivity, and lifelong learning.
- **W 6, W 10, SL 5, SMP 5, RI 7** Use a variety of media to present information for specific purposes.
- **W 6, W 10, SL 2, SL 5, SMP 3** Demonstrate how the use of various techniques and effect can be used to convey meaning in media.
- **RI 5, RI 7** Identify probable types and locations of Web sites by examining their domain name.



Next Generation Science Standards

Within the Next Generation Science Standards (NGSS) are the engineering standards, which apply to all of STEM Fuse's curriculum. These foundational skills help students problem solve by utilizing the Engineering Design Cycle (EDC - also known as the Engineering Design Process) to develop solutions to real world problems, and are featured throughout all STEM Fuse curriculum. Science standards are also applied in lessons within the GAME:IT and STEM:IT series.

Kindergarten through 2nd Grade

- **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- **K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

3rd Grade through 5th Grade

- **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- **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.

Middle School (Grades 6-8)

- **MS-ETS1-1.** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- **MS-ETS1-2.** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

- **MS-ETS1-3.** Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- **MS-ETS1-4.** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

High School (Grades 9-12)

- **HS-ETS1-1.** Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
- **HS-ETS1-2.** Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- **HS-ETS1-3.** Evaluate a solution to a complex real-world problem-based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
- **HS-ETS1-4.** Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.



Additional Comments

For more detailed standards regarding specific STEM:IT Challenges, please contact curriculum@stemfuse.com and we'll be happy to assist you!