

This one-pager explains what STEM fluency skills are and why they are important to Science, Technology, Engineering, and Mathematics (STEM) careers. It can be used alongside the [STEM Fluency Skills Rubric](#), which is designed to support educators in developing these skills with students.

## What are STEM Fluency Skills?

STEM fluency skills encompass a range of abilities essential for success in science, technology, engineering, and mathematics fields. These include communication, creativity, critical thinking, collaboration, resilience, promptness, adaptability, time/materials management, and innovation. STEM fluency skills prepare individuals for career readiness

and workforce development by enabling individuals to effectively navigate complex problems, work well in teams, and adapt to rapidly changing environments. Mastery of these skills supports individuals in contributing meaningfully to their fields and drives innovation.

## Prekindergarten–Grade 8

The STEM fluency skills identified for prekindergarten through grade 8 are developed through STEM awareness and exploration experiences. These skills include collaboration, communication, creativity, critical thinking, and resilience. The goal of STEM programming for this grade band is for Texas students to internalize and practice these skills before entering high school.

These skills are **integral attributes** for an education and career in STEM.



### Collaboration

Collaboration enhances teamwork, encourages various opinions, and teaches the importance of compromise. STEM professionals connect with their colleagues on a deeper level by considering their perspectives and anticipating their responses. By working together, individuals can leverage each other's strengths and address weaknesses, leading to more innovative and effective solutions.



### Communication

Communication plays a central role in STEM education and careers, drawing on language skills, body language and etiquette, and verbal and written communication to effectively convey complex ideas. Active listening and comprehension of written material are also essential for effective teamwork and to stay informed. Strong communication skills enable STEM professionals to share knowledge, collaborate efficiently, understand the needs of the team or user, and contribute to advancements within the field.



### Critical Thinking

Critical thinking underpins effective problem-solving. It allows individuals to systematically develop and apply strategies and processes to tackle simple and complex problems. Critical thinkers can make informed decisions and innovate solutions by analyzing data, evaluating evidence, and considering multiple perspectives. This skill set is crucial for advancing knowledge, driving technological progress, and addressing real-world challenges in STEM fields.



## Creativity

Creativity drives innovation and problem-solving. Creative thinking allows individuals to approach challenges from new angles and generate unique solutions and ideas. The design process, which involves brainstorming, prototyping, and iterating, relies heavily on creativity to develop effective, user-friendly products and systems. By fostering creativity, STEM professionals can push the boundaries of what is possible and contribute to advancements in technology and science.

Creativity and innovation, while closely related, differ in their focus and application. Innovation involves turning creative ideas into practical, tangible solutions that add value.



## Resilience

Resilience fosters perseverance and a growth mindset. Perseverance helps individuals push through challenges and setbacks, which are common in STEM fields. A growth mindset fosters a culture of continuous learning and improvement, where failures are seen as valuable opportunities for growth and development. These qualities enable STEM professionals to navigate difficulties, innovate, and remain motivated.

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# High School

High school students build on the prekindergarten–grade 8 STEM fluency skills and add new skills—innovation, promptness, effective time and resource management, and adaptability. High school students can apply the full range of these skills through sample work products, internships, apprenticeships, and immersive experiences that prepare them for future STEM careers.

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## Innovation

Innovation drives progress and addresses complex challenges. It encourages creative problem-solving and the development of new technologies, processes, and solutions. Creativity and innovation, while closely related, differ in their focus and application. Creativity is the spark of an idea, and innovation is the process of bringing that idea to life and making a real-world impact. By fostering innovation, STEM professionals can push the boundaries of what is possible, leading to advancements that improve our quality of life and solve pressing issues.



## Promptness and Effective Time and Resource Management

Promptness and effective time and resource management ensure projects meet deadlines, foster innovation, and maintain a competitive advantage. Efficient resource prioritization and utilization help manage costs and optimize task execution. Additionally, leveraging team members' individual strengths enhances collaboration, boosts overall performance, and supports professional growth. These elements are essential for achieving success and driving innovation in complex, multifaceted STEM projects.



## Adaptability

Adaptability allows professionals to respond effectively to rapidly changing technologies, methodologies, and industry demands. Adaptability fosters proactive thinking and action, enabling individuals to anticipate challenges and seize opportunities. This flexibility helps people navigate uncertainties, integrate new knowledge, and continuously improve processes. Adaptability ensures that professionals can pivot and adjust strategies, tools, and teams to achieve the best outcomes.

