STEM DEFINES OUR FUTURE

Soft Skills and STEM Success
Our continuously evolving, innovation-driven society requires workers trained in more than traditional academic subjects. Research focused on college and career readiness identified specific critical thinking skills and learning mindsets students need for success in school and in life. These abilities, often called soft skills, are social and behavioral attributes that affect how we relate to and interact with others. Success in STEM requires proficiency in math, science, and technology as well as self-awareness, self-management, an inclusive mindset, and interpersonal skills. Students who develop these abilities — including communication, teamwork & collaboration, creativity & problem-solving, leadership mindset, inclusivity, and resilience — will have the tools needed to thrive in fast-paced, highly technical environments.

As a country, we’ve made great progress in terms of diversity in STEM (Science, Technology, Engineering & Math) but there’s still work to be done toward greater inclusivity and representation.

- About a quarter of the U.S. workforce is employed in STEM occupations.
- In 2021, among people ages 18 to 74 years, women made up half (51%) of the total U.S. population and about a third (35%) of people employed in STEM occupations.
- In 2020, women were underrepresented among degree recipients at all degree levels in physical and earth sciences, mathematics and computer sciences, and engineering.
- The U.S. STEM workforce gradually diversified between 2011 and 2021, with increased representation of women and underrepresented minorities — Hispanics or Latinos, Blacks or African Americans, and American Indians or Alaska Natives.
- Workers with one or more disabilities represent a small proportion (3%) of the total workforce. Among workers with at least one disability, 21% worked in STEM occupations, which is slightly less than the 24% of non-disabled workers in STEM occupations.

Source: Diversity and STEM: Women, Minorities, and Persons with Disabilities 2023 | NSF - National Science Foundation
I have no doubt that the survival of the human race depends at least as much on the cultivation of social and emotional intelligence as it does on the development of technical knowledge and skills.

LINDA DARLING-HAMMOND

Source: Social Emotional Learning: Essential for Learning, Essential for Life | nysed.gov

First Book partnered with General Motors (GM) to create resources that help students connect the dots between what they are learning in their traditional STEM classes; skills like communication, teamwork, and creative problem-solving; and the rewarding STEM careers of the future. As part of First Book and GM’s STEM Defines Our Future series, First Book developed videos that celebrate diversity in STEM, showcase a variety of STEM fields and specialties — such as design, engineering, and manufacturing — and highlight the important role nontechnical skills play in career satisfaction and success. Through these engaging videos, students will learn about career paths and opportunities they may know little about and gain a greater understanding of how soft skills like leadership and resilience contribute to career success and life satisfaction. This resource includes the video series and additional support tools you can use to develop and nurture these soft skills in your students.

This resource explores six of the most critical soft skills. Each skill is featured in a separate video and is paired with expert-informed classroom activities and strategies, relevant research, and related federal or state academic standards, benchmarks, and best practices.

To provide students with an overview of the collaborative and complex process of building a car and introduce them to some of the people and professions they will encounter in the soft skill videos, share the introductory How to Build a Car video before continuing with the soft skill video series.

After sharing How to Build a Car, tell students they will now learn about both the technical and non-technical skills that are required to work in the automotive industry and other STEM fields.
Communication is how we transmit facts, thoughts, questions, feelings, and opinions — the giving and receiving of information. Skills and abilities that help with communication include perspective-taking and active listening.

Communication is fundamental to success in STEM fields. Whether in a lab or a manufacturing plant, scientists, engineers, and technicians need to communicate efficiently with each other as well as convey technical knowledge to a variety of audiences. STEM professionals — from video game designers to automotive engineers — need to be able to communicate their visions clearly and persuasively.

Why It’s Important

The benefits of developing effective communication skills in students include:

- **For Learning:** Students who know how to ask questions when confused will learn and retain more information, spark productive classroom discussions, and encourage other students to ask questions too.

- **For Relationships:** Learning how to clearly express needs and desires and resolve conflicts will lead to more satisfying personal and professional interactions and relationships.

- **For Character Development:** Communication skills improve confidence, motivation, self-advocacy, empathy and compassion, emotional intelligence, and mental well-being.

- **For Career Success:** Effectively communicating skills, knowledge, and interests during interviews will help students obtain after-school and summer jobs and help with college interviews, apprenticeship applications, and future careers.

Communication in Action

**WATCH THE VIDEO**

If you have a question, four or five people in that room have the same question. The sooner you can get it out in the air and understand how people got to where they are, you can move forward that much more quickly and be more equipped to act. Get really comfortable asking questions and see it as an opportunity to gain more information.

BRIAN, GM EXPERIMENTAL METAL MODEL MAKER
Try This

DISCUSSION QUESTIONS

• Why is being a strong communicator important?
• Why is communication important to teamwork?
• Why is communication a necessary component in driving innovations that define our future?
• What can go wrong when people don’t communicate consistently or clearly?
• What are ways to become a better communicator?
• What is active listening? Why is it important for communication?
• What is perspective taking? Why is it important for communication?
• Why is honesty important when communicating?
• In the video, why do you think Sylvia emphasized the importance of being precise and efficient when communicating?

ACTIVITIES & TEACHING STRATEGIES

Many games and activities help students practice communicating clearly and effectively.

1 Description Drawing Activity for Developing Language Skills: Divide students into pairs and allow only one of them to see one of the drawings provided in the Appendix. The student who can see the image will practice using descriptive and accurate language to communicate the visual as the other student tries to recreate it not having seen it themselves. This activity, adapted from artclasscurator.com, encourages students to “express and listen carefully to ideas [and] integrate information from oral, visual...and media sources” (Common Core).

2 Activities to Teach Students to Communicate the Properties of an Object: Observing and describing the properties of an object is a foundational scientific skill. Understanding an object’s properties and characteristics is the first step toward making predictions about behavior and creating classification systems. The five activities described here can be adapted to different ages and classroom needs and give students the opportunity to observe, identify, and then accurately and clearly convey their observations.

3 Communication Activities to Sustain Classroom Relationships: Communicating is about more than conveying information. Taking time to share their backgrounds, interests, plans, and feelings is how students develop a sense of belonging. This collection of student engagement strategies offers a variety of ways (e.g., morning meetings, friendly Fridays, two-minute talks, and gab and go) to foster community in the classroom while focusing on the four dimensions of classroom relationships: teacher to individual student, teacher to whole class, student to student, and student to whole class.

4 Learning How to Have a Conversation: This ice-breaking activity meets the Common Core requirement to “adapt speech to context and task” (Common Core). Students practice asking common introductory and conversational questions and learn techniques for beginning and ending conversations given a variety of scenarios.
Standards

Educators often are required to map their curricula to national and state academic standards. In this section, First Book provides suggestions and links to relevant standards and benchmarks.

**COMMON CORE STANDARDS**

**English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects**

**Speaking and Listening**

Flexible communication and collaboration: Including but not limited to skills necessary for formal presentations, the Speaking and Listening standards require students to develop a range of broadly useful oral communication and interpersonal skills. Students must learn to work together, express and listen carefully to ideas, integrate information from oral, visual, quantitative, and media sources, evaluate what they hear, use media and visual displays strategically to help achieve communicative purposes, and adapt speech to context and task.

Source: [Common Core Standards](#)
Group work can elicit groans from students, but working in teams is a fundamental part of our educational system and most careers.

Why It’s Important

The increasing emphasis on collaborative learning is one of the most successful applications of educational psychology. Hundreds of research studies have confirmed the benefits of teamwork and collaborative learning for students, including:

• For Learning: Teamwork and collaboration enhance academic performance and the retention of information.

• For Relationships: The practice of both asking for help and providing support leads to healthier and more satisfying interpersonal relationships and increased self-esteem, well-being, and empathy.

• For Character Development: Collaboration helps students develop a deeper appreciation for the importance of inclusivity and how a collective use of individual strengths and perspectives can lead to innovation.

• For Career Success: Teamwork provides opportunities to practice and develop career-ready skills, such as leadership, self-management, critical thinking, problem-solving, and creativity.

Teamwork & Collaboration in Action

WATCH THE VIDEO

Teamwork is everything. It has a tremendous role in success. Communication, leadership, willingness to speak out, and including everyone. We’re all from different backgrounds. We’re all different people. We all have different feelings, thoughts, and emotions, but when it all comes together, it is this beautiful picture.

BRIANNA, GM GROUP LEADER
Try This

DISCUSSION QUESTIONS

• What are the benefits of teamwork and collaboration? What are the challenges?
• How do you overcome challenges and obstacles during teamwork? What were some of the examples that GM employees noted in the video about how they overcame challenges and obstacles as part of a team?
• How do you think GM employees work as a team even when it looks like they are doing individual jobs on the line?
• What is necessary for teamwork to succeed?
• What is an example of a team you are part of?

ACTIVITIES & TEACHING STRATEGIES

Collaboration and teamwork can be the focus of specific lessons and activities as well as woven into your classroom culture and daily routines. Some examples include:

1. **Take a Pause**: Teamwork and collaboration don’t have to be complicated. A simple technique is pausing in the middle of an activity or lesson, dividing students into pairs or small groups, and having students ask each other about something they don’t understand. If others can answer the question, great! If no one can answer the question, you’ve identified a challenge for the whole class and can spend time reviewing the concept or skill. This technique encourages students to “integrate and evaluate information presented” (Common Core).

2. **Create an Escape Room**: Escape rooms are fun challenges that involve critical thinking skills and teamwork. Working together to figure out how to escape encourages “collaborations with diverse partners, building on others’ ideas and expressing their own clearly and persuasively” (Common Core). Choose from a selection of free, pre-made escape rooms, or design your own. Here are a few free examples for different age groups:

   **Ages 6 and up**
   Pikachu’s Rescue
   Escape the Fairy Tale: Part 1

   **Ages 11 and up**
   Space Explorer Training – Digital Escape Room
   The Minotaur’s Labyrinth Escape Room

   You can also create your own virtual escape room or select from additional themes and age levels.

3. **Team Building for STEM Challenges**: This simple, fun project is all about teamwork. Using string and a binder clip or shower curtain ring, students work together to lift and balance a variety of common objects on the ring. Concentration and communication are the keys to success as students encourage each other to hold steady or increase the tension. After completing this activity, ask students to reflect on what they learned about what was important about working together as a team to accomplish a goal.
Standards

Educators often are required to map their curricula to national and state academic standards. In this section, First Book provides suggestions and links to relevant standards and benchmarks.

COMMON CORE STANDARDS

English Language Arts Standards/Anchor Standards/College Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

- Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others’ ideas and expressing their own clearly and persuasively.
- Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric.

Source: Common Core Standards

In addition to the Common Core Standards, many states have relevant state-based standards. For example:

STATE STANDARD: ILLINOIS

Use social-awareness and interpersonal skills to establish and maintain positive relationships. Why this goal is important: Building and maintaining positive relationships with others are central to success in school and life and require the ability to recognize the thoughts, feelings, and perspectives of others, including those different from one’s own. In addition, establishing positive peer, family, and work relationships requires skills in cooperating, communicating respectfully, and constructively resolving conflicts with others.
Many creative people are drawn to the arts, but creativity is found, and needed, in all fields and areas of our lives. In our technological world, creativity is an essential skill that leads to innovation and problem-solving. Creativity can lead to new theories, methods, and solutions that expand our understanding of the world or offer new real-world applications.

Why It’s Important

Research shows that teaching children creative problem-solving skills can improve their mental health by showing them how to overcome problems that at first seemed insurmountable. And with the dizzying speed of change and innovation, creative problem-solving is a key future-ready skill.

Activities that encourage and require creative problem-solving have many benefits, including:

- **For Learning**: Higher-order cognitive skills, such as critical thinking and problem-solving, are required for creative assignments, and research has shown that creativity is tied to the motivation to learn.
- **For Relationships**: The process of working through a problem with others is an opportunity to strengthen relationships through collaboration and appreciation of everyone’s unique gifts and perspectives.
- **For Character Development**: Creative problem-solving is a trial-and-error process that often involves managing disappointment and frustration. Confronting these emotions productively leads to resilience and self-awareness.
- **For Career Success**: Creative problem-solving is one of the most sought-after skills by employers and this ability is correlated with economic success in adulthood.
Creative Problem-Solving in Action

Try This

DISCUSSION QUESTIONS

• How can creativity help with problem-solving?
• How does creativity come into play even when using a process-based approach like the scientific method?
• Sylvia, an electrician, talked about how creative problem-solving is necessary whether the line goes down for two hours or two days. How do you think creative problem-solving plays into getting the line back up again?
• How does working as part of a team make creative problem-solving easier?
• In what ways do you use creative problem-solving at school? At home?

We should never put creativity in a separate bucket because it’s part of everything that you do. Even if you’re cooking something, creativity is involved in that, how you are dressing, it’s involved in that. When you choose a professional career, it’s important to consider what you’re doing. You cannot let go of creativity and be happy in your profession.

PALLAVI, GM ADVANCED MOBILITY EXPERIENCE DESIGNER

The Scientific Method

› Make an observation after noticing what’s happening in the world and gathering information (Ex: My car won’t start.)
› Formulate a question that’s relevant (Ex: Why isn’t my car working?)
› Develop a hypothesis, which means proposing an explanation and a prediction (Ex: The battery is dead, and if I get a new battery or recharge the current one, the car will work.)
› Design and conduct experiments to test how accurate your prediction is (Ex: Try jump starting the car.)
› Draw a conclusion from the data (Ex: Jump starting worked, so that means a dead battery was the reason my car wasn’t working.)
ACTIVITIES & TEACHING STRATEGIES

By encouraging students to reason by analogy and address open-ended problems, educators can nurture and encourage creative problem-solving. Examples of assignments that can be used to do this include:

1. **Blackout Poetry**: Blackout poetry is the act of creating a poem from a larger text by redacting the text so that the remaining words form a poem. Problem-solving requires students to creatively work within existing boundaries, and this blackout poetry lesson helps sharpen that skill set.

2. **Classification Activity**: See the Appendix for a printable page with 20 images of diverse items. Print out one page per student and have them cut out each of the different images. Set a timer for five minutes and have students organize the items into four categories that make sense to them. For example, a teacher, a calculator, a pair of scissors, a pencil, and a book could be items related to school. Ask for volunteers to share their categories and explain the thought process behind their decision. For a challenge for older students, try the Connections game from the New York Times. These types of activities require students to “use various types of reasoning (inductive, deductive, etc.)” and “analyze how parts of a whole interact with each other” (21st Century Skills/P21 Framework).

3. **Embrace Creativity in Math**: This site provides strategies to sharpen students’ problem-solving and creativity skills in math. Examples include giving students open-ended problems where multiple solutions are possible and having students formulate their own questions based on data provided. These creative math problems challenge students to “analyze givens, constraints, relationships, and goals” (Common Core). Find more tips for incorporating creativity in math classes and lessons here.

4. **Riddles**: Riddles are a fun and effective way to boost creative problem-solving skills. Instead of relying on memorization and established patterns, students must think creatively and apply logic to find solutions. Find age-appropriate riddles and challenging questions here and here.

Spark your students’ imaginations and nurture their creative problem-solving abilities with books from the Resourcefulness section on the First Book Marketplace.

Shop the First Book Marketplace
Standards

Educators often are required to map their curricula to national and state academic standards. In this section, First Book provides suggestions and links to relevant standards and benchmarks.

COMMON CORE STANDARDS
Mathematical Practice

Make sense of problems and persevere in solving them: Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze given, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.

Source: Common Core Standards

A popular framework for standards relating to soft skills is the Batelle for Kids P21 Framework. Here is the standard related to critical thinking and problem-solving:

21ST CENTURY SKILLS/P21 FRAMEWORK
Critical Thinking and Problem-Solving

Reason Effectively

• Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation
• Use systems thinking
• Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems
• Make judgments and decisions
• Effectively analyze and evaluate evidence, arguments, claims, and beliefs
• Analyze and evaluate major alternative points of view
• Synthesize and make connections between information and arguments
• Interpret information and draw conclusions based on the best analysis
• Reflect critically on learning experiences and processes

Solve Problems

• Solve different kinds of non-familiar problems in both conventional and innovative ways
• Identify and ask significant questions that clarify various points of view and lead to better solutions

Source: batteleforkids.org
Leadership Mindset

A leader is someone who guides or inspires others and moves them to action. Being a leader requires a leadership mindset, which includes adapting to changing situations, being able to mobilize others around an idea, and maximizing the abilities and strengths of all team members. Skills that help with a leadership mindset include communication, inclusivity, creative problem-solving, and teamwork.

Leadership is much more than setting expectations and giving directions. Leaders motivate and support, give credit to others, show empathy, communicate effectively, and work to improve morale.

**Why It’s Important**

Providing students opportunities to practice and hone their leadership skills will benefit them in many areas and stages of their lives:

- **For Learning:** Leadership offers many opportunities for hands on learning through the process of trial and error, collaboration, taking initiative, and reflection.
- **For Relationships:** Serving in a leadership role is an opportunity to practice interpersonal skills and develop respect for people with different perspectives, work styles, and values.
- **For Character Development:** Practicing a leadership mindset will improve students’ communication skills, honesty, integrity, humility, patience, perseverance, creativity, confidence, sense of responsibility, empathy, and resilience.
- **For Careers:** Leadership roles (whether on a sports team, a job, or a school or community organization) look great on resumes and enhance college and career opportunities.

**Leadership in Action**

In a 2022 survey of the First Book Network, **84% of educators** said they consider leadership skills very or extremely important for students to develop.

I work with fantastic people. I make sure first thing in the morning they’re ready to go. I make sure their trucks are ready, I make sure they’re charged. If they don’t have a truck, I’ll go down to repair to see if there’s one ready, and I’ll bring it to them. I make sure they have their PPE and that team schedules are set. I just take care of them to make sure we get the ball rolling and get these parts out.

KIM, GM TEAM LEADER

WATCH THE VIDEO
DISCUSSION QUESTIONS

• What are the qualities of a good leader?
• How does a leader support their team?
• What did you learn about what it means to be a good leader from the GM employees featured in this video?
• In the video, GM employees talked about the importance of teamwork as part of leadership. How did hearing them explain the relationship between teamwork and leadership change your perspective about what it means to be a good leader?
• Why do you think strong leaders use diversity and inclusion to build effective teams?
• Why do you think leadership is important in innovation?

ACTIVITIES & TEACHING STRATEGIES

Leadership roles and opportunities can be built into classroom routines, made part of extracurricular activities, or become the focus of a lesson. Some examples include:

1. **Tower Building Activity**: The tower building activity featured in the Changemaking Leadership Time Saver (part of First Book and Ashoka’s Time for Change initiative) allows students to consider the different requirements and responsibilities of certain roles (advisor, builder, and observer) as they use “interpersonal and problem-solving skills to influence and guide others toward a goal” (21st Century Skills). Each role offers the opportunity to reflect on various aspects of leadership, such as making decisions, taking action, and offering support and feedback.

2. **Practicing Leadership Abilities**: These lessons from ACT and MAWI Learning cover four skills all leaders need: active listening, optimism, assertiveness, and the ability to encourage others. The lessons include tangible tips like “maintain eye contact” as well as reflection exercises to help students identify the difference between a pessimistic and optimistic outlook.

3. **Leadership and Service Organizations**: As students develop and feel comfortable using their leadership skills, they can effectively put their ideas into action. There are many organizations and resources to support emerging leaders that you can share with your students:
   - **Ashoka’s Youth Venture**: Youth Venture offers tools and resources to youth to launch and lead their own social change ventures. The program also runs online challenges to support new and pre-existing ideas for social change as well as form online communities of support and information sharing.
   - **DoSomething.org**: DoSomething is a youth activism hub that has members all over the U.S. and in 189 countries. Members participate in campaigns to take action on causes that impact them and their communities.
   - Find additional opportunities for students to lead, serve, and volunteer in the Civic Engagement resource section on What Kids Can Do.
Stem Defines Our Future: Soft Skills and Stem Success

Inspire your students to be responsible classmates and take on leadership roles with books from the Leadership and Responsibility sections on the First Book Marketplace.

Standards

Educators often are required to map their curricula to national and state academic standards. In this section, First Book provides suggestions and links to relevant standards and benchmarks.

The eight standards for mathematical practice within the Common Core contain several connections to leadership abilities and strategies.

Common Core Standards

Mathematical Practice

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years.

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and express regularity in repeated reasoning

Source: Common Core Standards

A popular framework for standards relating to soft skills is the Batelle for Kids P21 Framework. Here is the standard related to leadership:

21st Century Skills/P21 Framework

Leadership and Responsibility

Guide and Lead Others

- Use interpersonal and problem-solving skills to influence and guide others toward a goal
- Leverage strengths of others to accomplish a common goal
- Inspire others to reach their very best via example and selflessness
- Demonstrate integrity and ethical behavior in using influence and power
- Act responsibly with the interests of the larger community in mind
- Encourage knowledge sharing among communities of practitioners, using face-to-face, virtual, and blended communications

Source: batelleforkids.org
Inclusivity & Empathy

Inclusivity means being aware of barriers that exclude some people from participating fully and actively in all areas of life and finding sustainable, equitable ways to bridge those barriers. Empathy is being aware of and sensitive to the feelings, thoughts, and experiences of other people. Skills that help with inclusivity and empathy include perspective-taking and active listening.

Empathy is the first step toward inclusion because it allows us to see the world from another person’s perspective, relate to their experiences, and include them. Inclusion is important because all voices and people have value and deserve to contribute inside and outside of the classroom or workplace to the best of their abilities.

Why It’s Important

Empathy and inclusivity are fundamental to building strong relationships and creating environments that promote social harmony. Providing inclusive environments and nurturing empathy in students are important because:

• **For Learning:** All students thrive in learning environments that are inclusive of disabilities and differences. Inclusive environments increase confidence and engagement because all students see themselves reflected in the classroom.

• **For Relationships:** Empathetic people have more secure and satisfying relationships and lower levels of stress, and inclusive environments foster friendships among diverse groups and deepen feelings of belonging and understanding.

• **For Character Development:** Empathy and inclusivity are antidotes to bullying and other social problems.

• **For Careers:** Empathetic people excel at teamwork and collaboration and have greater professional satisfaction. Teams that include multiple voices and perspectives are more innovative and reflect our country’s diversity and collective strength.

A diverse workforce provides the potential for innovation by leveraging different backgrounds, experiences, and points of view. Innovation and creativity, along with technical skills relying on expertise in science, technology, engineering, and mathematics (STEM), contribute to a robust STEM enterprise.

NATIONAL SCIENCE FOUNDATION SURVEY, *Diversity and STEM: Women, Minorities, and Persons with Disabilities* (2023)
Inclusivity in Action!

Accessibility kind of sounds like a big word that might be hard to understand, but it’s really designing things so they can be used by a broad range of people with a broad range of different abilities.

MARIANNE, GM ACCESSIBILITY PROGRAM ENGINEER MANAGER

WATCH THE VIDEO

Try This

DISCUSSION QUESTIONS

• What is empathy and why is it important?
• What is inclusivity and why is it important?
• How is empathy related to inclusivity?
• In the video, Karen says that one step above inclusivity is embracing differences and learning from them. What did you learn from this statement, and how could it affect your daily life and interactions?
• How do empathy and inclusivity relate to accessibility?
• How does inclusivity impact creativity and innovation?

Inclusivity to me means I look around and I see people not only like me, but people not like me. And we’re all there because of our talents and skills and not because of how we look or who we know.

SYLVIA, GM ELECTRICIAN/SKILLED TRADES
**ACTIVITIES & TEACHING STRATEGIES**

Children naturally have the capacity for empathy, but they often need explicit instruction and modeling to support the development of this foundational social-emotional ability. Educators can help create empathetic school communities by rejecting stereotypes, respecting and valuing differences, listening closely, and navigating situations ethically and fairly. Activities to nurture empathy and inclusivity include:

1. **Humpty Dumpty and Design Thinking**: This lesson combines empathy and engineering, two abilities needed for the field of accessible design, which aims to create products that can be used by people with disabilities. Students will consider why Humpty Dumpty fell off the wall, brainstorm solutions, and build a prototype of their design.

2. **Empathy and Inclusivity in Action**: We tend to focus on negative news, but there is a lot of good happening all around us. Find a story in the news or from the Good News Network to discuss as a class so students can be inspired by real-life examples of empathy, inclusivity, helping, and kindness. These examples serve as a model of “caring… charity, compassion, consideration, cooperation, empathy, generosity, kindness, and patience” (Texas SEL Standard).

3. **The Compassion Project**: Just one of EVERFI’s social emotional learning training courses, the Compassion Project helps educators teach elementary school students the critical skill of compassion, which increases students’ sense of well-being and improves the learning environment for all learners. The compassion project consists of six lessons, three geared towards lower elementary school students (2nd and 3rd graders) and three geared towards upper students (4th and 5th graders). EVERFI’s online character education curriculum, training, and support are completely free to K-12 educators.

4. **Inclusivity in STEM**: In the Inclusivity video, a GM employee mentions “curb cuts” as an example of universal design. Curb cuts allow people who use wheelchairs to easily move from the sidewalk to the street and were required by law in the U.S. starting in 1990. Although intended for wheelchair users, able-bodied people with strollers, suitcases, and other wheeled items have also found them helpful. As a research project, ask students to select an invention that allows more people to participate in all aspects of cultural and economic life. If students need help identifying an invention, suggest: screen readers that can convert text to speech or Braille, closed captioning, voice recognition technology, and accessible transportation. Questions to address include:

   • Who was the inventor or innovator?
   • What population was the invention originally intended to help?
   • Have other groups used this invention as well?
   • Have they used it in a way that is different from how it was originally intended?
Standards

Educators often are required to map their curricula to national and state academic standards. In this section, First Book provides suggestions and links to relevant standards and benchmarks.

**COMMON CORE STANDARD**

Understand other perspectives and cultures. Students appreciate that the twenty-first-century classroom and workplace are settings in which people from often widely divergent cultures and who represent diverse experiences and perspectives must learn and work together. Students actively seek to understand other perspectives and cultures through reading and listening, and they are able to communicate effectively with people of varied backgrounds. They evaluate other points of view critically and constructively. Through reading great classic and contemporary works of literature representative of a variety of periods, cultures, and worldviews, students can vicariously inhabit worlds and have experiences much different than their own.

Source: Common Core Standards

*In addition to the Common Core Standards, many states have relevant state-based standards. For example:*

**STATE STANDARD: TEXAS**

The standards for positive character traits and personal skills are comprised of four strands: trustworthiness, responsibility, caring, and citizenship. Each strand consists of the following character traits and personal skills.

- **Caring:** interpersonal skills, including charity, compassion, consideration, cooperation, empathy, generosity, kindness, and patience.

- **Students are expected to develop an awareness of self-identity as well as recognize multiple perspectives, differences, diversity, biases, and the social and cultural context in which they live.**

Source: Texas Administrative Code

**STATE STANDARD: NEW YORK**

Learners will be able to: Recognize and build empathy for the feelings and perspectives of others.

Source: NYS SEL Benchmarks
Resilience is the ability to focus on goals and forward movement despite the inevitable setbacks and challenges. Skills that help with resilience include problem-solving and flexibility.

Instilling resilience in children at a young age will serve them well as they encounter difficulties and challenges throughout their schooling and beyond. Strategies we can use to increase our resilience include cultivating a supportive network, developing problem-solving skills, practicing positive thinking and gratitude, and goal setting.

Why It’s Important

Seeing “failure” as an opportunity to learn can be the difference between giving up and persisting. Students who give up on themselves or a specific subject area after experiencing setbacks and challenges are restricting their options and opportunities for the future and missing out on opportunities to learn and grow. Providing opportunities for students to manage stress and disappointments in a healthy way will help them in many ways:

• **For Learning**: Students who learn how to accept challenges, and even failures, as part of the learning process will persevere through setbacks.

• **For Relationships**: Resilient people cope better when relationships are tested due to issues related to money, mental or physical health, etc.

• **For Character Development**: Resilience is associated with longevity, lower rates of depression, and greater satisfaction with life.

• **For Careers**: Resilience increases efficiency and effectiveness because challenges become lessons that lead to innovation and learning.

We get a lot of roadblocks, and it can be disheartening. I allow myself just a small moment of sulking and then you just got to press on.

MELISSA, GM SUSTAINABLE MATERIALS ENGINEER
Try This

DISCUSSION QUESTIONS

• How do you define resilience?
• How does patience relate to resilience?
• How does asking for help relate to resilience?
• In the video, GM employees shared examples of how they were resilient and how that resilience paid off in their careers. What did you learn from their stories and advice?
• It famously took Thomas Edison one thousand attempts to invent the lightbulb. He looked at these attempts as one thousand steps, but another person might have seen them as one thousand failures. Why do you think it was so important for Edison to look at his attempts as steps as opposed to failures? What could have happened differently if he had seen them as failures instead of steps?
• Why is resilience important at school and in our personal lives?
• How is resilience related to innovation and invention?

ACTIVITIES & TEACHING STRATEGIES

➊ SMART Goals: Part of being resilient is learning how to break down large goals into smaller, achievable pieces. Help your students create specific, measurable, attainable, relevant, and timely goals using this SMART goal resource from On Our Sleeves that will help them celebrate small milestones and keep them focused on their goals.

➋ Paper Rockets to Learn the Scientific Method: This Science Buddies lesson is designed for middle school students and combines the fun of building paper rockets with the application of the scientific method. The scientific method is a road map for developing resilience: Ask questions, research, come up with a hypothesis, experiment, analyze, and draw conclusions with the expectation that not every attempt will be a success. In this lesson, students “monitor and evaluate their progress and change course if necessary” (Common Core), embracing the idea that perfection is not instantaneous. After they complete the activity, ask students to share what they learned about resilience and how it relates to STEM fields. The Teacher Toolbox includes a paper rocket assembly video, student worksheet, and scientific method quiz (Google classroom).

➌ What Is Engineering? This simple lesson from Generation Genius is a great introduction to engineering and focuses on the relationship between resilience and innovation. The lesson includes discussion questions like “What can you do if a solution to a problem doesn’t work the first time?” and “Why don’t engineers get upset when their solution doesn’t work?”

Shop the Resilience & Perseverance section of the Marketplace for books that show students how fictional characters and real people persevered through challenges.
STEM Defines Our Future

Educators often are required to map their curricula to national and state academic standards. In this section, First Book provides suggestions and links to relevant standards and benchmarks.

Many states have relevant state-based standards. For example:

STATE STANDARD: TEXAS

The standards for positive character traits and personal skills are comprised of four strands: trustworthiness, responsibility, caring, and citizenship. Each strand consists of the following character traits and personal skills.

- Trustworthiness: honesty, integrity, loyalty, punctuality, and reliability
- Responsibility: accountability, diligence, perseverance, self-control, and self-management.
- Caring: interpersonal skills, including charity, compassion, consideration, cooperation, empathy, generosity, kindness, and patience
- Good citizenship: having concern for the common good and the community; having respect for authority, law, justice, and the rights of others; being free from prejudice; having gratitude and school pride; being courteous, fair, and patriotic; and making responsible decisions

Source: Texas Administrative Code

Now that your students have explored the relationship between soft skills and the exciting world of STEM, inspire them to dream big, for themselves and for our world, with this final video in this series, STEM Defines Our Future.
Appendix

COMMUNICATION:
DESCRIPTION DRAWING ACTIVITY
FOR DEVELOPING LANGUAGE SKILLS

PROBLEM-SOLVING & CREATIVITY:
CLASSIFICATION ACTIVITY

GM EMPLOYEES FEATURED IN THE VIDEO SERIES

SOURCES
COMMUNICATION: DESCRIPTION DRAWING ACTIVITY FOR DEVELOPING LANGUAGE SKILLS
### PROBLEM-SOLVING & CREATIVITY: CLASSIFICATION ACTIVITY

<table>
<thead>
<tr>
<th>Acorn</th>
<th>Piece of Candy</th>
<th>Leaf</th>
<th>Penny</th>
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<tbody>
<tr>
<td>Book</td>
<td>Tree</td>
<td>Pair of Scissors</td>
<td>Bicycle</td>
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<tr>
<td>Sunglasses</td>
<td>Hat</td>
<td>Dog</td>
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<tr>
<td>Ball</td>
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<td>Stroller</td>
<td>Pencil</td>
<td>Calculator</td>
<td>Pizza</td>
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</table>
Alejandro Grevi, *Wood Model Maker*, creates small-scale and full-scale models of vehicles that can be used for basic spatial observation or as a realistic model that can be driven on the street.

Alvin Carter, *Wood Model Maker*, creates small-scale and full-scale models of vehicles that can be used for basic spatial observation or as a realistic model that can be driven on the street.

Anthony Coleman, *Electrical Manufacturing Supervisor*, manages a team that works to troubleshoot any issues that arise with equipment on the plant floor.

Brenda Korth, *Senior Environmental Engineer*, develops and executes plans for providing clean, safe water for drinking and other purposes and seeks to innovate ways to reduce, reuse, and recycle waste.

Brian Bungard, *Metal Model Maker*, works on crafting materials, mostly metal, into highly finished design pieces.

Brianna Jones, *Group Leader*, leads a team of employees who work on the production line to assemble parts.

Daemian Wilson, *Senior Shader & Material Creation Specialist*, digitally recreates every paint, leather, plastic, and other material used in cars for realistic computer modeling.

David Hoobler, *Controls Engineer*, works to problem solve any issues that arise with the equipment on the plant floor.

Jeff Thompson, *Electrician/Skilled Trades*, provides maintenance and repairs to the electrical power within the facility including wires, machines, and other equipment.

John Katona, *Human Factors & Accessibility Engineer*, conducts research and user testing of vehicle controls to learn what features customers like best and applies that knowledge with the vehicle team to make products more usable and accessible.

Justin Salmon, *Senior Creative Designer*, uses engineering and design to imagine and visualize new vehicles, features, and solutions.

Kelly Broadwick, *Metal Model Maker*, creates physical representations or prototypes of future vehicles.

Karen De Los Santos, *Creative Digital Sculptor*, interprets designer sketches into 3D models that are shared with clay sculptors, engineers, manufacturing, and many other disciplines, and anticipates and problem-solves potential design and manufacturing challenges before production.

Kimberly Gomillion, *Team Leader*, oversees a team of employees who work on the production line to assemble parts that are created by running sheets of metal through large machines.

Madaga Sarr, *AB1V 10 Speed Transmission Maintenance Lead*, manages day-to-day manufacturing floor processes and engages with different teams to solve issues for safety, process, and quality.

MaryAnn Beebe, *Accessibility Program Engineer Manager*, leads a team that helps design autonomous vehicles so that people in wheelchairs can safely ride in them.

Melissa Phipps, *Senior Sustainable Materials Engineer*, works to implement more sustainable materials, such as recycled plastic, in GM’s vehicles by working with suppliers and engineering teams to find solutions that are better for the planet but do not sacrifice quality or the customer experience.
Pallavi Gautam, *Advanced Mobility Experience Designer*, identifies emerging transportation needs and uses the latest design tools to conceive of new vehicle designs and mobility solutions.

Rachel Gribas, *Senior Environmental Engineer*, helps GM sites solve complex environmental problems related to air, water, and waste regulatory compliance and develops and executes the overall regulatory environmental strategy for the company to ensure GM creates products in an environmentally responsible way.

Rajiv Saintina, *Human Resources*, serves as a “resource for humans” by providing employees with the resources and support they need throughout their careers at GM.

Sylva Tran, *Electrician/Skilled Trades*, provides maintenance and repairs to the electrical power within the facility including wires, machines, and other equipment.

Teddy Halkoski, *Team Leader*, oversees a team of employees who work on the production line to assemble parts that are created by running sheets of metal through large machines.

Theogene “Theo” Lavergne, *Assistant Plant Director*, manages the everyday operations of the facility.

Velma Johnson, *Body Shop Shift Leader*, manages a group of employees to ensure that the bodies of trucks are assembled effectively and efficiently.

For information about GM’s Design Center and educational programs, visit [www.gm.com/design](http://www.gm.com/design).
SOURCES

Communication
Activities to Teach Students to Identify the Properties of an Object | The Edvocate
Art Class Curator
Social-Emotional Learning Programs | Committee for Children
23 Ways to Build and Sustain Classroom Relationships | Edutopia

Teamwork & Collaboration
Better Kid Care | Penn State Extension
Collaborative Learning: The Science Behind It, and Why It Works | Cambridge University
Creative a Virtual Escape Room | California Teachers Association
Examples of Collaborative Learning or Group Work Activities | Center for Teaching Innovation Cornell University
An Educational Psychology Success Story: Social Interdependence Theory and Cooperative Learning | researchgate.net

Problem-Solving & Creativity
Cultivating Creativity in Standards-Based Classrooms | Edutopia
Six Ways to Help Kids Grow Their Creativity | Berkeley.edu
The Long-Lasting Benefits of Childhood Creativity | Psychology Today
Why Children Need Creative Problem-Solving Skills | invent.org
5 Reasons Why It Is More Important Than Ever to Teach Creativity | International Society for Technology in Education (ISTE)
5 Simple Ways to Add Creativity in Mathematics | edCircuit

Leadership Mindset
ACT SEL Skill Building: Leadership | Share My Lesson
Fueling Young People to Change the World | DoSomething.org
Leadership Time Saver | First Book
What Kids Can Do
Youth Venture Everyone a Changemaker | Ashoka

Inclusivity & Empathy
How to Build Empathy and Strengthen Your School Community – Making Caring Common | harvard.edu
How to Create a STEM Dream Culture for All Students | KQED
The Compassion Project – Elementary Empathy Curriculum | everfi.com
The Importance of Inclusive Education | Cambridge English
The Importance of Teaching Our Children to Be Empathetic | Psychology Today

Resilience
SMART Goals for Kids | On Our Sleeves
Paper Rockets to Learn the Scientific Method | sciencebuddies.org
What Is Engineering? | Generation Genius
Ramp Up Your Resilience! | Harvard Health