THE RISE OF

STEM

IN SCHOOLS

Over the last decade, the U.S. has seen nearly
2 MILLION NEW STEM JOBS
but students' math and science scores continue to lag behind other nations*

HOW CAN SCHOOLS BETTER PREPARE THEM WITH BADLY NEEDED STEM SKILLS?

*According to The International Math & Science Study (TIMSS)

WHAT IS STEM?

SCIENCE | TECHNOLOGY | ENGINEERING | MATH

Coined in 2001 by Judith Ramaley, Assistant Director of Education & Family Resources at the National Science Foundation (NSF)

Since then, STEM-focused curricula have extended around the world

IN 2005, "RISING ABOVE THE GATHERING STORM" WAS RELEASED BY THE NATIONAL ACADEMIES OF SCIENCES AND ENGINEERING, AND THE INSTITUTE OF MEDICINE

Argued **U.S. students were academically behind** in STEM achievements

The same year, American 8th graders placed 12th in math and science skills* – behind Singapore, Japan, Taiwan, South Korea, and Hong Kong

*According to The International Math & Science Study (TIMSS)

Predicted **dire economic consequences** of a poorly prepared workforce

At the time, the U.S. patent office granted more patents (51%) to foreign nationals and foreign companies than to Americans

Reflected a newfound **focus on STEM careers and curriculum**

WHY IS STEM ESSENTIAL?

86% of Americans believe that increasing STEM-trained workers is **vital to maintaining the nation's place in the global economy**

Just **15% of Americans pursue natural science degrees** – far less than in other nations

South Korea	France	China	Singapore
38%	47%	50%	67%

"We go where the smart people are. Now our business operations are two-thirds in the U.S. and one-third overseas. But that ratio will flip over the next 10 years."

HOWARD HIGH
CHIEF SPOKESMAN FOR INTEL

"A physicist is one of the most employable people in the marketplace....a trained problem solver. How many times have you heard a person in a workplace say, 'I wasn't trained for this!' That's an impossible reaction from a physicist, who would say, instead, 'Cool.'"

NEIL DEGRASSE TYSON

Raising a STEM workforce starts long before college – **Where do schools begin?**

STEM 101

HOW STEM BUILDS SKILLS

STEM is an ever-evolving and expanding field – success requires the ability to continue to **learn and adapt to new situations**

Activities present engaging materials for hands-on learning

PROJECT-BASED LESSONS HELP BUILD SOFT SKILLS, LIKE

- Creativity & innovation
- Problem-solving & critical thinking
- Collaboration & leadership

"Making [something] highlights relationships. You don't have to know everything – you use the resources of the community."

LISA BRAHMS
Director of Learning and Research at the Children's Museum of Pittsburgh

HISTORY OF STEM IN THE CLASSROOM

2007
America COMPETES Act

- **Increased funding for STEM education** and research programs
- Most of the funding went to **NSF scholarships for STEM teachers**

Today, 71% of students in the U.S. students have a science curriculum influenced by NGSS

2013
Next Generation Science Standards (NGSS)

- Internationally benchmarked, research-based **learning targets**
- Developed through a **wide-ranging partnership, including**
  - The National Academies of Sciences, Engineering, & Medicine
  - The National Science Teachers Association
  - The American Association for the Advancement of Science
  - State-level representatives and other stakeholders

2015
Every Student Succeeds Act (ESSA)

Obama called bipartisan support for the bill a "Christmas miracle"

- **Increased federal funding** for K-12 STEM, including
  - Activities, after-school programs, and field trips
  - Professional development and teaching materials
  - Specialty schools and magnet programs
- Established **STEM Master Teacher Corps**
- **Added computer science** as a core subject

Today's high school graduates are some of the first to go through all of K-12 education with a **focus on STEM**

IS STEM WORKING?

TEST RESULTS ARE MIXED

From 1995 to 2015, U.S. students*

Improved their **math skills** significantly*

	1995	2015
4th-graders scores	518	539
8th-graders scores	492	518

Both high- and low-performing students showed **improvement**

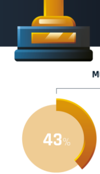
But, **science scores** weren't as promising

	1995	2015
4th-graders scores	542	546
8th-graders scores	513	546

Low-performing students improved, but **high-performing students declined**

Improvement was only seen amongst the **lowest-performing students**

*According TIMSS



FROM 2015 TO 2018, U.S. STUDENTS IMPROVED THEIR INTERNATIONAL STANDING*

*According to PISA

In 2015, 10th-grade students ranked **#35 MATH**, **#17 SCIENCE**

In 2018, 10th-grade students ranked **#30 MATH**, **#11 SCIENCE**

But, actual scores have remained **stagnant for over a decade**

MORE GRADS CHOOSE STEM

43% **Growth** of undergraduate in STEM from 2010-2016

3 IN 4 college grads majored in STEM-related fields in 2018

86% of high school graduates plan **to pursue a STEM career**

BUT, With 8 of the 10 fastest-growing jobs in STEM, **2.4 million positions still went unfilled in 2018**

THE CRISIS ISN'T OVER

More than **HALF OF U.S. PATENTS** still go to foreign nationals and foreign companies

The U.S. remains a net importer of high-tech products

92% of employers say their need for employees with technical skills is increasing

74% say finding the right talent is getting harder

As technology grows, specific skills become obsolete – **the ability to adapt, learn, and solve problems will be the future of the STEM workforce**

GROW YOUR ABILITY TO "LEARN BY DOING" AND YOUR SKILLS WILL NEVER BE OBSOLETE

SOURCES

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EARLY CHILDHOOD EDUCATION DEGREES

DEVELOPED BY NOWSOURCING