



Inspiring students,
engaging educators, and
strengthening communities
to build a better world
through the science of chemistry.





#YouBeTheChemist

BUILDING THE FUTURE WORKFORCE BY INSPIRING STUDENTS TODAY

You Be The Chemist connects businesses and educators to achieve a critical need: **preparing students for the workforce.**

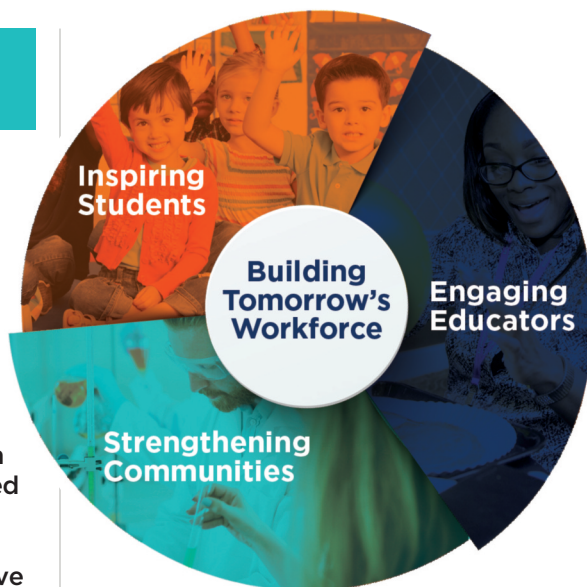
When it comes to preparing the STEM workforce – those industries relying on science, technology, engineering, and mathematics – often the focus is on students in high school and post-secondary education.

But the truth is, if students aren't inspired by science when they are young – **as early as five years old** – it gets increasingly harder to engage them in learning and ultimately, enter careers in STEM industries.

The Chemical Educational Foundation's *You Be The Chemist* programs uniquely connect business and education in local communities to reach students early in life and ignite a passion for chemistry and science-related careers.

Companies and individuals in the science and chemistry industries have invested in *You Be The Chemist* since 1989, to inspire young students into a lifelong passion for these fields. Programs are implemented in partnership with schools and education programs so activities align with local workforce and learning needs.

You Be The Chemist continues helping businesses and education providers show young students the potential to build a better world through the science of chemistry.



Together, our programs



Inspire and motivate youth to seek careers in STEM fields



Raise educator confidence in teaching chemistry concepts and content



Spotlight employee expertise through impactful local volunteer opportunities

Start Early

Research shows that if more children are to enter the STEM pipeline, then educators in early elementary grades need to be prepared to provide interesting and engaging lessons that focus on developing children's problem-solving and spatial ability while encouraging their intrinsic interest in STEM.



Strategies & Impact: HELPING BUSINESSES INVEST & EMPLOY

You Be The Chemist fills the workforce gap by engaging young students in science experiences.

You Be The Chemist Strategies:

- ➔ **Inspire students early** in life to pursue science and chemistry in study and careers.
- ➔ **Engage educators** to build their confidence in teaching hands-on science using common, inexpensive items.
- ➔ **Strengthen communities** by connecting students and educators with volunteers from science industries.

Impact:

➔ Strengthening communities.

We are **creating connections** among students and volunteers from science and chemistry industries.

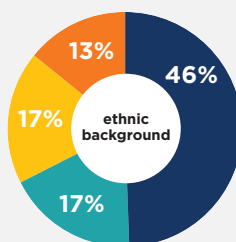
Aidan Blum participated in the National Challenge in 2006. He went on to major in chemical engineering and now works at PVS Chemicals, Inc.—the same company who sponsored the Local Challenge Aidan participated in as a sixth grader.



Impact:

➔ Inspiring students.

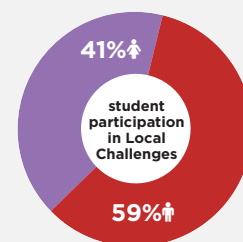
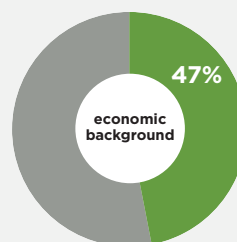
We are serving a **large and diverse student population**.



Engaged nearly
648,000 students
in the 2017-18 school year

10%
increase from
the previous
year

■ 47% Received Title 1 Funding
(designation based on % of low
Income students)



Impact:

➔ Engaging educators.

We are **empowering educators** to teach science in grades K-8, and with the supplies needed to do so.

Approximately
1,800
educators
supported



84%
Feel confident in their ability to
teach science in the classroom

versus

48%
before program
participation

THE AMERICAN WORKFORCE NEEDS STEM WORKERS

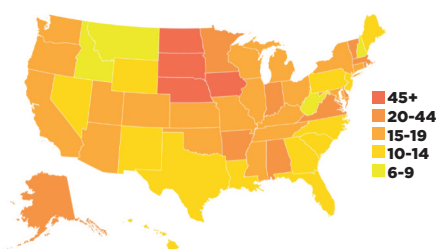
Students Must Be Better Activated to Consider Jobs in Science-Related Industries



America needs a workforce ready for STEM-related jobs at all levels – but it's not happening.

Jobs are unfilled – opportunities abound for skilled and degreed workers.

Number of STEM jobs advertised online for every unemployed STEM worker (2015)



In 2018, an estimated
1.2 Million STEM JOBS
will not be filled
by our nation's employers

**WE'RE
HIRING**

The Basic STEM Skills Gap
38% of companies

say at least half of their entry-level job applicants
in the U.S. lack even basic STEM skills

BY 2022: **1 Million STEM Opportunities**

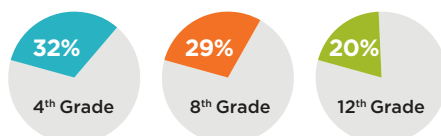
middle skill
growing 2.5 times faster
than non-STEM jobs

4-year
degree

Projected for individuals who are
STEM literate or have related degrees.
Half will not will not require a 4-year degree.

Too few students receive early,
hands-on science instruction to
prepare them for employment.

Few students are proficient in science



More than half
of 4th graders receive
**less than
3 hours
of science
instruction/week**

Research Shows:



U.S. students lag international
students in STEM rankings



Educators need more support
to confidently teach science to
young students.



61%

Percentage
of 4th graders
whose schools
provide supplies
or equipment
for science labs

**Only
9%**

of 4th graders had
teachers who learned
about instructional
methods in science
"to a large extent"

**ONLY
39%**



of elementary school educators
feel very well prepared to teach science

48%

low confidence

Educators surveyed
before participating in
You Be The Chemist
programs report low
confidence in their
ability to teach hands-on
science instruction.

You Be The Chemist Programs: BUILDING THE FUTURE WORKFORCE

You Be The Chemist celebrates the role of science and chemistry in everyday learning and life.

Essential Elements

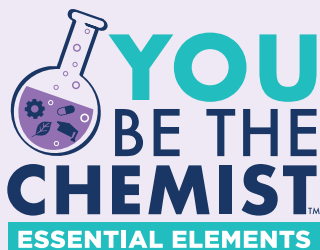
Professional development workshops that build confidence in teaching science.

We equip K-8 educators with best practices for STEM education, share resources for science learning, and build educator confidence in leading inquiry-based, hands-on learning.



Over 70%
of attending educators
since 2015 work in public
schools ✓

PARTICIPANTS ARE:
more confident teaching science;
offer more hands-on learning in the
classroom; and report that their
students enjoy learning
science more



Activity Guides

Hands-on science lessons that use common, inexpensive items to teach science in the classroom.

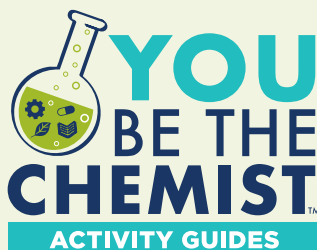
Hands-on learning is proven to engage young students in exploring science.

Our Activity Guides are educator-friendly roadmaps for using household items, without formal lab space, so students can explore foundational science concepts anywhere.



Now in its **5th** edition, with
over 1,000
activities

Organized by content to align with standards | Spanish translation in production



Academic Challenge

Celebrate and elevate the science of chemistry to inspire students in the field.

This local, state, and national academic competition targets students in grades 5–8, when most U.S. students have not studied chemistry as its own subject. Students prepare for multiple-choice quiz bowl competitions and advance to the annual, prestigious National Challenge that celebrates the role of chemistry in businesses and communities.



82%
of students are
more interested
in STEM careers
after participating in the
You Be The Chemist
Challenge





You Be The Chemist: Essential Elements Building Educator Confidence to Teach More Science, Better



Research Shows:



61%

Percentage of 4th graders whose schools provide supplies or equipment for science labs

Only 39% of elementary school educators feel very well prepared to teach science

ONLY
39%
PREPARED



48%

low confidence

Educators surveyed before participating in *You Be The Chemist* programs report low confidence in their ability to teach hands-on science instruction.

Essential Elements Provides:

- Professional development that builds K-8 educator confidence to implement hands-on science activities with students
- Connections among educators and chemistry professionals to enhance classroom instruction and elevate students' career interest.
- Access to Activity Guides that use common, inexpensive items to teach science in the classroom

Program Specifics:

In the U.S., minority students have the least experienced educators, limited access to supplies and equipment for science labs, and educators who lack the resources to succeed. Our Essential Elements program tackles these issues head on:

Ability to deliver in partnership with local chemistry businesses



Aligned with learning standards yet flexible for local use



Time to practice using free, provided materials that educators will bring back to classrooms.



Workshops taught by trained professional development providers



Opportunity to complete required continuing education credits, for free



Impact:



Educators surveyed before and after Essential Elements workshops and again 30 months later indicated an increased confidence in teaching science and plan to offer more science-based activities in the future.



Our data show that workshop participants are **more confident teaching science** and they **offer more hands-on learning in the classroom**, and they report that **their students enjoy learning science more**.

"I loved the connection between educators and professionals in chemistry."

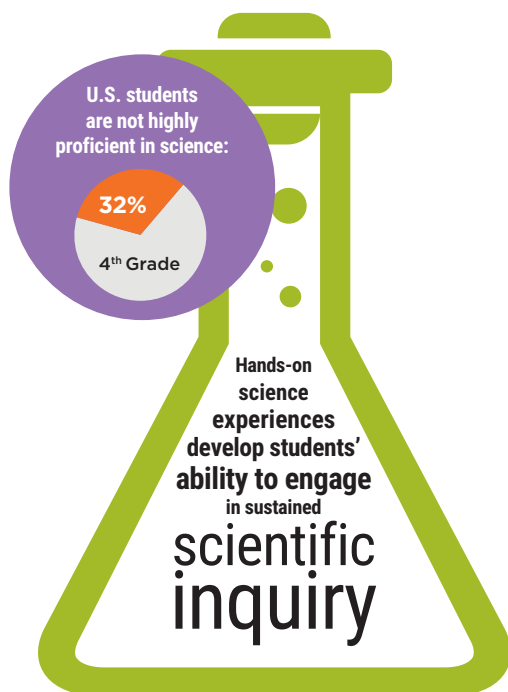


You Be The Chemist: Activity Guides

"I love the hands-on activities. I can't wait to take all these activities back to my classroom!"



Research Shows:



Activity Guides Provide:

- Flexibility for hands-on science learning: no lab space or equipment needed; deliver in classroom or out-of-school time learning
- Student engagement with foundational science concepts that align with learning standards
- Educator and student confidence to explore science and chemistry

Program Specifics:

Nearly 50 hands-on science activities using common, inexpensive items



Real-world connections to careers and life that rely on science and chemistry concepts



Explanations to help educators build confidence with science content and instruction



Differentiation techniques to enrich learning in K-8, and across ability levels



"You made it so easy to follow along and gave us everything we needed. So simple since I am so busy so THANK YOU!!!!!!"

Impact:

Nearly 150,000 students are reached through distributed Activity Guides



Activity Guide Topics:

- ✓ Properties of Matter
- ✓ Chemical Reactions
- ✓ Energy
- ✓ Forces & Interactions
- ✓ Life & Earth Sciences

Where can I use the Activity Guides?

- ✓ Classrooms
- ✓ Libraries and museums
- ✓ At home
- ✓ Afterschool programs
- ✓ Science fairs
- ✓ Children's hospitals
- ✓ Camps
- ✓ School family nights

...and more!



You Be The Chemist: Challenge

Celebrate and elevate the science of chemistry to inspire on-going study and careers



Research Shows:

- 🔍 Early science exposure inspires students to further study and work in these fields
- 🔍 Before high school, most U.S. students have not studied chemistry as its own subject, making it more difficult to prepare them for higher learning, training, and working in STEM fields

The Challenge Provides:

- 🔧 Exposure to chemistry concepts in grades 5-8 — earlier than most U.S. students even begin studying chemistry
- 🔧 Connections with industry professionals to see how chemistry offers needed and fulfilling careers
- 🔧 Volunteer opportunities for science and chemistry professionals in their local communities, who play a critical role

“The Challenge has been eye opening for me as to just how important it is to reach out to younger students.”

Program Specifics:

Students prepare and then compete individually for their Local Challenge, if available in their communities. Participants seek to advance to their State and then National Challenge. Only one student from each state and territory is represented at the National Challenge annually. Nominated educators join their state's student at the National Challenge to further celebrate the science of chemistry. In 2019, the Challenge is in its 15th year.

Collaboration among science industries, educators, and community partners



Local, state, and national academic competitions



Flexible local programming so preparation can be part of the school-day or out-of-school time activities



Approximately 100 Challenge volunteers, in 42 states plus D.C. and Puerto Rico, receive technical assistance and training



College scholarships plus other prizes to National Challenge winners and participants



Impact:

86%
of students feel more confident in their **ability to understand** chemistry



82%
of students are **more interested in STEM careers** after participating in the *You Be The Chemist* Challenge



80%
of students report having an **increased awareness** of chemistry's role in everyday life

