Today’s Students are Tomorrow’s Innovators.

Challenger Center ignites their potential.
Too many lose interest in science, technology, engineering, and math (STEM) at an early age … which limits their opportunities in life and our country’s competitiveness abroad.

- K-12 students interested in STEM
- 50% lose interest by 8th Grade
- Start to decide on their path in 4th grade
- Increasing demand

Jobs requiring STEM skills
What Do Students Need to Stay Engaged?

- **Context**: “Why does this matter to my life?”
- **Vision**: “Where could this lead?”
- **Inspiration**: “This is cool! I want to know more!”
CONE OF LEARNING
(EDGAR DALE)

After 2 Weeks we tend to remember

<table>
<thead>
<tr>
<th>Nature of Involvement</th>
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</thead>
<tbody>
<tr>
<td>Reading</td>
</tr>
<tr>
<td>Verbal Receiving</td>
</tr>
<tr>
<td>Hearing Words</td>
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<tr>
<td>Looking at Pictures</td>
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<tr>
<td>Watching a movie</td>
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<tr>
<td>Looking at an Exhibit</td>
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<tr>
<td>Watching a Demonstration</td>
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<tr>
<td>Seeing it Done on Location</td>
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<td>Participating in a discussion</td>
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<td>Giving a Talk</td>
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<tr>
<td>Doing a Dramatic Presentation</td>
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<td>Simulating the Real Experience</td>
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<td>Doing the Real Thing</td>
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<tr>
<td>Receiving/Participating</td>
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<tr>
<td>Doing</td>
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</tbody>
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Source: Edgar Dale’s Cone of Experience
Our Programs: **Hands-on STEM Experiences**

**Core Elements of All Programs**

- Combination of computer-driven simulation and hands-on activities
- STEM concepts in context of exciting real-world scenarios
- Build critical 21st century skills: communication, critical thinking, collaboration, and problem solving
- Introduce STEM careers
- Informed by real science data, delivered at an age appropriate level
- Aligned to current national education standards
Our Programs: Impacts

Core Impacts Measured in All Programs

• STEM Engagement: Increase student engagement in STEM
• STEM Self-Efficacy: Increase student feeling that they can “do STEM”
• STEM Career Awareness: Increase students awareness of a range of STEM careers
• 21st Century Skills: Increase student communication, collaboration, critical thinking, and problem solving skills
Our Programs: Hands-on STEM Experiences

CENTER MISSIONS

CLASSROOM PROGRAMS
Current Reach

43 Centers
260,000 students
26 U.S. States
plus United Kingdom, Canada, South Korea
Center Missions

• Grade range: 5th-8th grade
• Delivered only at Challenger Learning Centers by trained Flight Directors
• Custom, fully-immersive environment (Space Station and Mission Control)
• ~2 hour simulation, plus pre- and post-mission curriculum
• Theme: Space
The Challenger Center Experience
3 minute video
https://www.youtube.com/watch?v=seb3fhx8axw
Technological change in the last decade has changed education.
The Digital Age - Years to 50 million Users

- Radio – 38 years
- TV - 13 years
- Cellphone - 7 years
- Internet - 4 years
- Facebook - 4 years
- iPad (2010)
- iPhone (2007)
- Apple II (1977)
- Macintosh (1984)
- IBM PC Win 1.0 (1981)
- Win 95 (1995)

Source: Graph of growth in transistor count (1971-2011)
Today’s Classroom

• Flexible

• Students are encouraged to collaborate and problem-solve, more than practice rote facts and memorize content

• Access to various forms of technology throughout the school day
Technology in Schools

• Devices for every student.

• Internet connectivity in school.
  • In 2003, 4 million students (less than 10%)
  • In 2014, 39 million (75%).

• New generation of tech-savvy teachers and administrators.

• New generation of tech-savvy kids: “digital natives.”
How is Challenger Center Responding?

Bringing Challenger Center’s expertise in simulations to millions of students in classrooms across the country via the Internet.
Opportunity in the U.S.

~50 million students in the U.S. K-12 education
Our Programs: Hands-on STEM Experiences

CENTER MISSIONS

CLASSROOM PROGRAMS
Classroom Programs

• Grade range: 3rd-10th grade
• Simulation delivered in the classroom by teachers
• Flexible design for easy classroom implementation
• Built in assessment tools allow teachers to see how students are progressing through the program
• Supplemented by hands-on extension activities – e.g., engineering challenge
• Themes (examples): Ocean, energy, space, weather, erosion, geology,
• Currently two programs: Aquatic Investigators (3-5th) and Earth to Mars (9-10th)

Can deliver to millions of students across the country
Aquatic Investigators

• First mission on our EngiLearn software platform
• Built with Department of Education funding
• Informed by NOAA data and Subject Matter Experts
• Based on our 30 years of leadership in simulated learning and teaming with other partners like NASA
The Mission
Pilot in 2016-17

- **Tested with over 2,100 students and teachers in central Virginia**
  - Underserved students in rural areas
- **87%** of teachers said they would use the program again in their classrooms
- Teachers rated student engagement with the Aquatic Investigators mission at 4.73 out of 5, with 5 being “very engaged”
- Teachers asked for more missions to cover all science modules in their curriculum
- Informal feedback from parents and students demonstrated deep, lasting engagement in ocean science
Frederick County Public Schools
Aquatic Investigators Pilot Experience
School Year 2016-17
3 minute video
https://www.dropbox.com/s/nyko7dm6188bntg/the%20challenger%20project_640x480_mp4.mp4?dl=0
Next Steps

• Editing in response to teacher feedback
  • Use the mission as an introduction to the ocean science unit of study
  • Want missions for all science units throughout the year

• Re-piloting with upgrades and a new technical character in 2018-19 school year

• Scale to DC, Maryland, Virginia area, and possibly a few key locations in the U.S. first; then will scale nationwide
Our Impact
SPARK A PASSION FOR LEARNING

5+ MILLION STUDENTS
HUMANS TO MARS SUMMIT
National Science Foundation Awards & Board Meeting
164,000 students participated in a Challenger Center Mission

2,100 students transformed into Aquatic Investigators in their classrooms

2 new Challenger Learning Centers opened

8,500 Students have already experienced our newest mission, Expedition Mars

95,000 Students took part in another STEM program at a Center

1 national recognition from the National Science Board (Public Service Award)

261,000+ students impacted by a Challenger Center program during the 2016-17 school year
Partners

NASA
DEPARTMENT OF EDUCATION
NOAA

BOEING
Orbital ATK
LOCKHEED MARTIN
AEROJET

Raytheon
Tyler-Little
Family Foundation

theISTAT Foundation
AFCEA Chapter
Humble Bundle

MICHAEL R SOLURI
REVEAL
VAN SCYOYOC ASSOCIATES
LATHAM & WATKINS LLP

Challenger Center
France Jackson

“I am not sure I would be an engineer if it were not for the hands-on experience I was able to engage in while at the Challenger Learning Center. I definitely consider the Center and my experience there a major event in my life that I often look back on and consider its profound impact.”

**Education:** B.S. Industrial Engineering, M.S. Industrial Engineering, Ph.D. Human-Centered Computing,(May 2018)

**Currently works** at Intel Corporation

“My experience at the Challenger Learning Center was simply life changing.”
Today’s Students are Tomorrow’s Innovators.

Challenger Center ignites their potential.
POSSIBLE FORWARD WORK WITH NOAA

• Additional missions for schools, aquariums, science centers to use in outreach to K-12 students
  • Disaster Dispatch, a 3rd-5th grade mission on Extreme Weather and Weather Resiliency
    • Proposed to NOAA’s Environmental Literacy Grant program in 2018
  • Challenger Center could create and distribute a mission on any Ocean Exploration topic for any K-12 age group
POSSIBLE FORWARD WORK WITH NOAA

• National Ocean Exploration Forum in Boston – November 2018
• Challenger Center could help increase reach
• Concept: Enable every Boston elementary school run the Aquatic Investigators program during the week of the forum
• Would require sponsorship to cover cloud fees and related costs (<$15,000)