GlobalMindED

Responsive STEM Education

How Project-based Learning Supports Differentiated and Student-Led Learning in the Classroom and Online During and After COVID-19

Ann Kaiser
Founder and CEO
Project Engin

Kaari Casey
Senior Program Manager, Virtual Programs
New York Academy of Sciences

Kathy Bihr
V.P. & Exec. Director
TGR Foundation

Dr. Susanne Thompson
Chief Operating Officer
Discovery Education

Bryan Colahan
Director of Curriculum Develop.
ProjectEngin LLC

Responsive STEM Education

How can we engage students in STEM disciplines/career fields?

Connecting curricular concepts to the real-world/empowering students to change the world

Supporting students with diverse talents and backgrounds

Benefits of using design challenges and PBL in the classroom and online

Resources/ideas that work

Engineer/educator – combined the two

We all engineer – the designed world needs to be part of every student's education

Challenges of the future will require diverse talent and backgrounds

Engineering can connect content to real-world issues with a focus on solutions

Projects based on engineering challenges support skills-based learning

ProjectEngin™

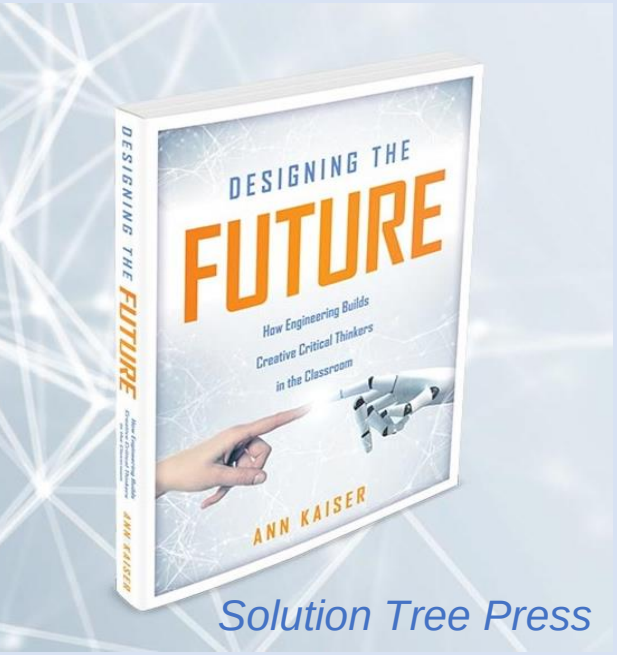
Ann Kaiser

akaiser@projectengin.com

www.projectengin.com

Engineering a Better World

Re-Engineering
the Science Fair



Solution Tree Press

EngineerGOOD™

Engineering Solutions to
Global Challenges

participate℠ ProjectEngin™

Moving Online:
Summer - Community of Practice (PLC)
Fall – PD Course

ProjectEngin™

Professional development

- creating online PLC

- developing online courses

Curriculum

- Middle school NGSS-based

- High school Engineering
Design elective

www.projectengin.com

TGR FOUNDATION

A TIGER WOODS CHARITY

DR. KATHERINE BIHR
VICE PRESIDENT, PROGRAMS & EDUCATION
TGR FOUNDATION

Katherine Bihr Ed.D. is the Vice President of Programs and Education for TGR Foundation, A Tiger Woods Charity, providing direction to the personnel, programs and operations of the TGR Learning Lab and the Earl Woods Scholar Program. TGR Foundation provides STEM career exploration and college preparation programs to high potential, low opportunity youth and families. It is through this work, she realized the importance of sharing these programs with educators and to meet that challenge created TGR EDU: Create, a professional learning program and TGR EDU: Explore, a digital resource designed for educators to use with students.

For over 24 years, TGR Foundation has been redefining what it means to be a champion.

VISION

A world where opportunity is universal and potential is limitless.

MISSION

Empowering students to pursue their passions through education.

TGR LEARNING LAB

After-School, In-School and Summer Classes for Grades 5 -12

The TGR Learning Labs allow students to discover personal interests, develop self-confidence and strengthen academic skills.

- **Flagship 35,000 square-foot innovation lab in Anaheim, housing eight smart classrooms, state-of-the-art makerspace and a theater-style auditorium**
- Satellites in Philadelphia, Washington, D.C., S. Florida and the Marine Corps Base in Quantico, VA
- Connects learning to career preparation
- **Served more than 175,000 students since its inception**

50+

areas of study in STEM and college-access, building workforce skills

TGR EDU: CREATE

TGR EDU: Create is a teacher training program incorporating **interdisciplinary approaches with inquiry-based, student-centered content** focused on STEM, college access and career connections.

- **STEM Studio** workshops are week-long educator trainings where teachers take on the role of students
- Innovative lesson design and **hands-on, project-based** learning activities
- Strategies to enhance teacher curricula and **prepare students for future STEM careers** and navigate through the college process
- Workshops held in **So. Cal, D.C., S. Florida, Santa Fe and Philadelphia**, with regions growing annually

TGR EDU: EXPLORE

Free Online Education for Students, Educators and Families

Launched in partnership with **Discovery Education** in 2017, TGR EDU: Explore is a digital version of our TGR Learning Lab, offering access to STEM curricula and college-access programming.

Available at no cost, the platform offers interactive lessons and video trainings in:

- **STEM subjects**, from robotics and biotechnology to city planning, biomimicry and more
- **College application** process
- **Financial aid** application

TGR FOUNDATION
A TIGER WOODS CHARITY

COVID-19 RESOURCES

In response to school closures brought on by COVID-19, TGR Foundation is finding new ways to provide educators, students and families with no-cost lessons and resources to support distance learning. Along with the 40+ STEM and college-access resources always available on TGREDUExplore.org, TGR Foundation's in-house team has created new learning content over the last several weeks:

Student and Family Resources

Design Challenges – No-cost English and Spanish family-friendly activities to unlock your creativity to explore, design and test solutions for real-world problems, with 20+ lessons to choose from

STEM Unplugged – Bi-monthly English and Spanish video lessons highlighting STEM activities for students to do at home

College-Access Resources – Designed to support students and families navigating the college admissions process during this challenging time Digital Workshops available on our You Tube College-Access Playlist

Digital Downloads:

Best Practices for High School Seniors

Tip and Resources to help High School and College Students manage COVID-19

Educator Resources

Create Café - Virtual Office Hours every Friday at 12:30pm PDT/3:30pm EDT and 3:30pm PDT/6:30pm EDT

Mindful Mondays – Live mindfulness sessions for educators

TGR EDU: Create Video Tutorials - Weekly tutorials offering tips and best practices to support educators with distance learning available on our You Tube Educator Training Playlist

All these resources and more can also be found on the TGR Foundation homepage

Discovery EDUCATION™

- Preparing learners for tomorrow by creating innovative classrooms connected to today's world
- 4.5 million educators and 45 million students worldwide
- Global leader in K-12 digital curriculum resources and professional learning

Responsive STEM Education: PBL Online

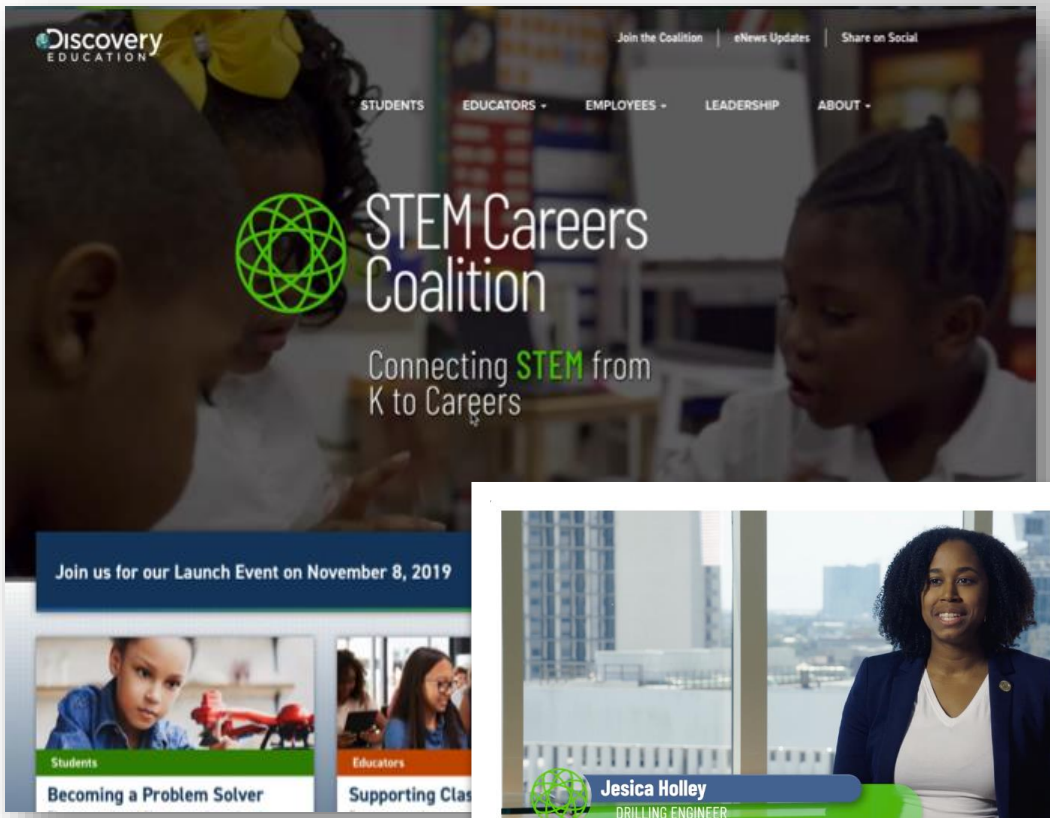
- STEM Careers & Skill Building - Project Based Learning
- STEM Focused - COVID-19 Response Resources

Susanne H. Thompson

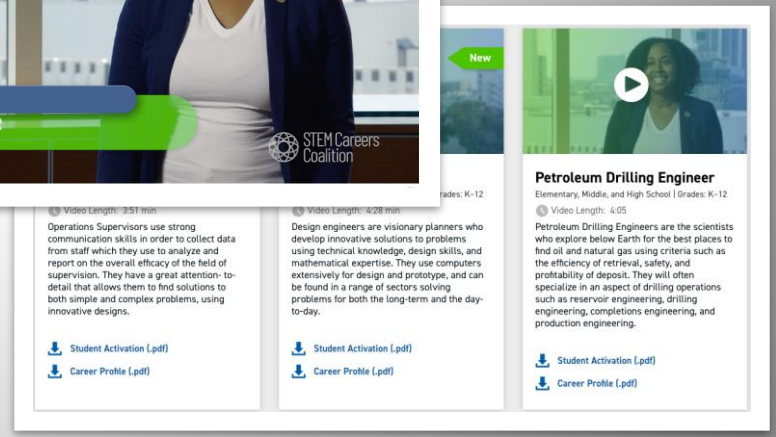
Chief Operations Officer
Corporate/Non-Profit Partnerships

STEM Careers Coalition

A first-of-its-kind STEM careers initiative that closes the workforce gap by bridging industry and classrooms at unprecedented scale.



STEM Careers

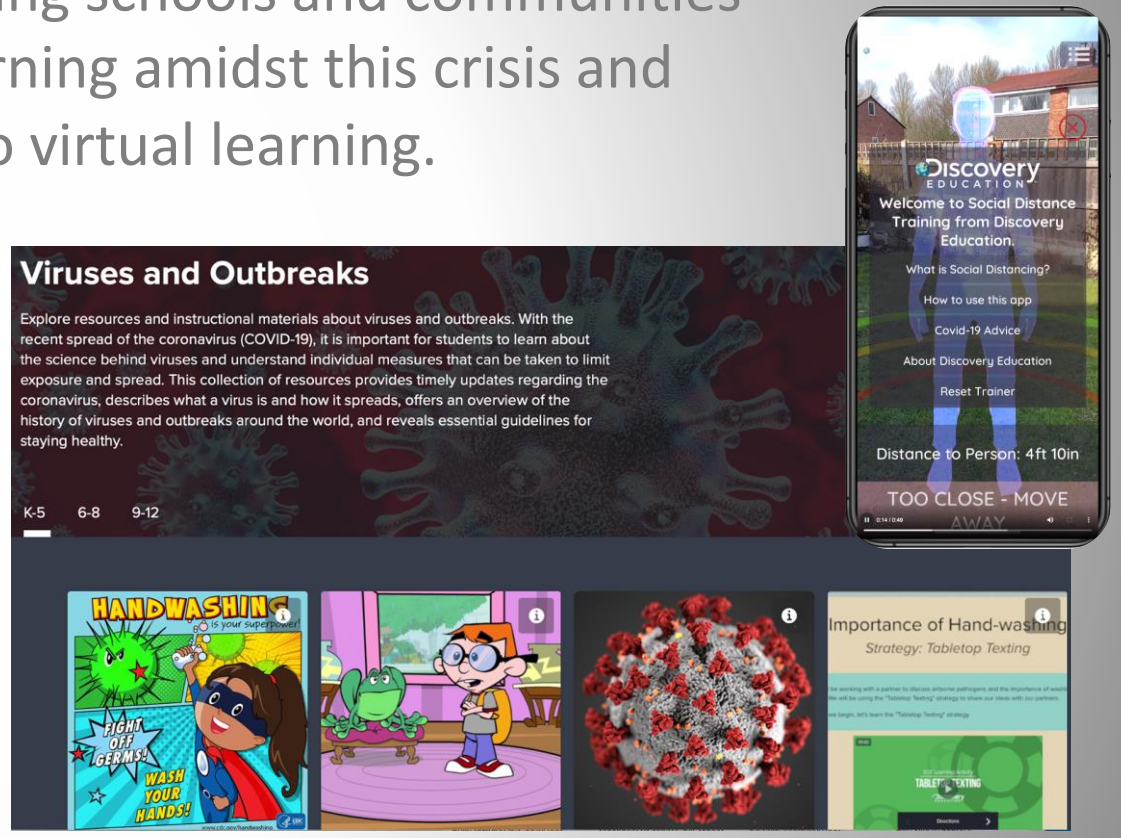


www.stemcareerscoalition.org

Coronavirus Response Resources

At Discovery Education we are committed to helping schools and communities maintain normalcy and maintain continuity of learning amidst this crisis and supporting educators throughout this transition to virtual learning.

- Daily DE for Parents
- Virtual Field Trips
- Lesson Planning
- Additional Topical Resources
- Social Distancing App



www.DiscoveryEducation.com/Virtual-Learning

Daily DE for Parents

https://den.discoveryeducation.com/participate/dailyde

Week 3: Grades 6-8

MINDS-ON MONDAY

Explore digital interactives that get you thinking.

TUNDRA TUESDAY

Learn more about polar bears, the arctic, and how you can help protect our environment.

WHELMERS' WEDNESDAY

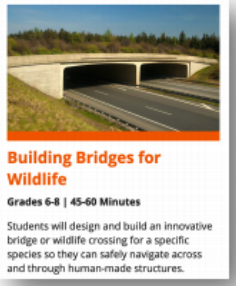
Get hands-on as you engage in the scientific thinking process.

THURZDAY SKILLZ DAY

Apply your thinking skills to real-world questions.

FIELD TRIP FRIDAY

Go on virtual field trips to amazing destinations.



STUDENT WEEKEND CHALLENGE

Check out Science Fair Central Maker Corner for some fun project ideas that will STEMulate your brain!

PARENT WEEKEND CHALLENGE

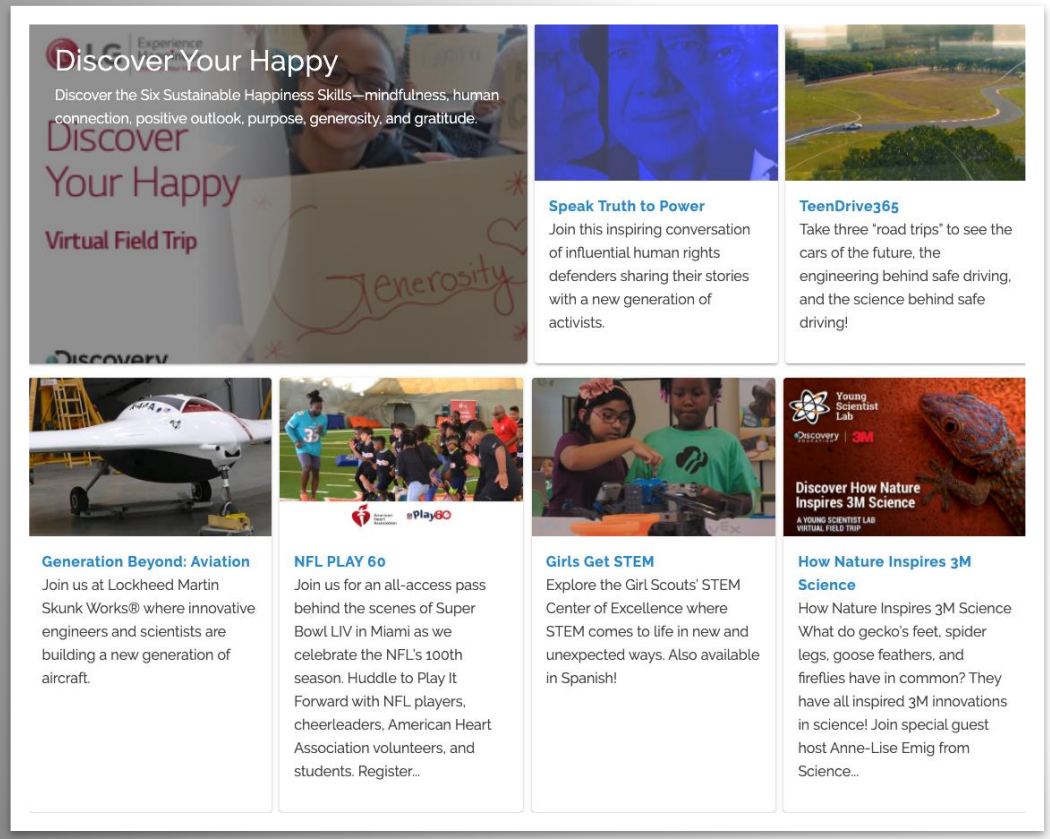
Explore tools to help your students make healthy decisions about E-cigarettes with parent resources and student activities from Be Vape Free.

Discovery EDUCATION

Resources for Parents/Caregivers

Virtual fieldtrips take students outside the walls of the classroom to learn about the world around them.

www.discoveryeducation.com/community/virtual-field-trips/

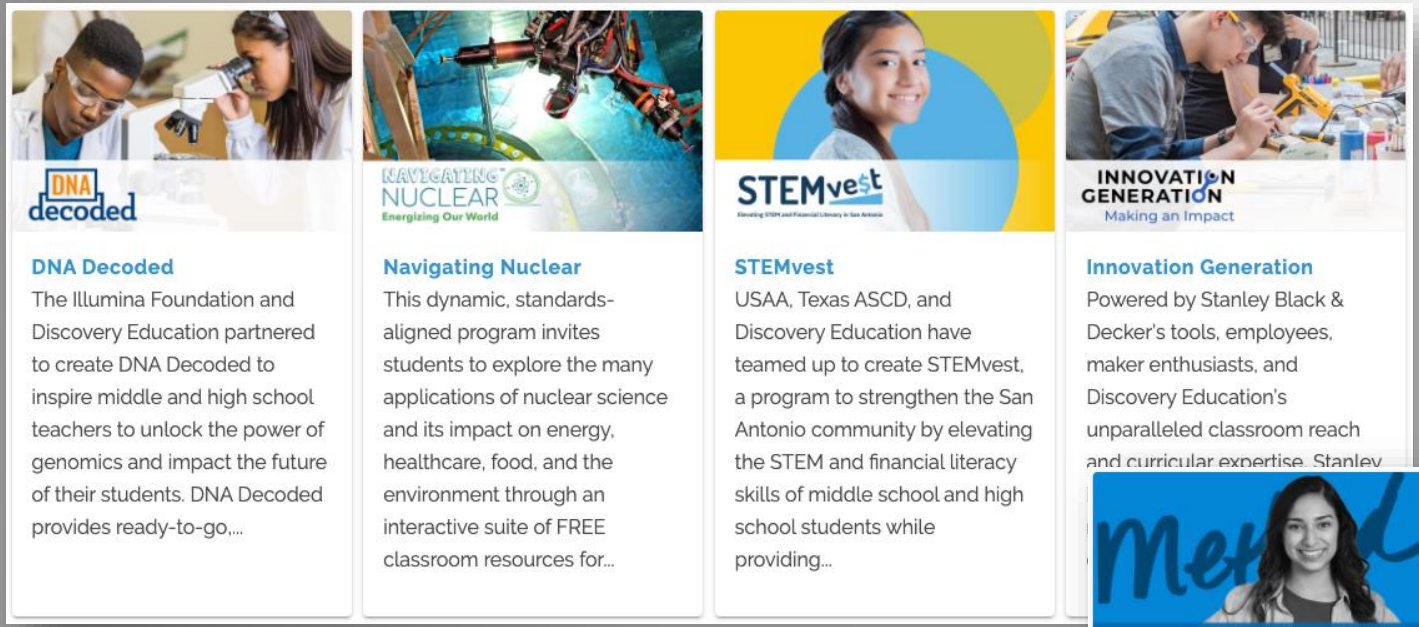


Resources for Educators

No cost resources to support teachers to develop **lesson plans** and create engaging, effective virtual learning.

www.discoveryeducation.com/virtual-learning/

Additional STEM Resources

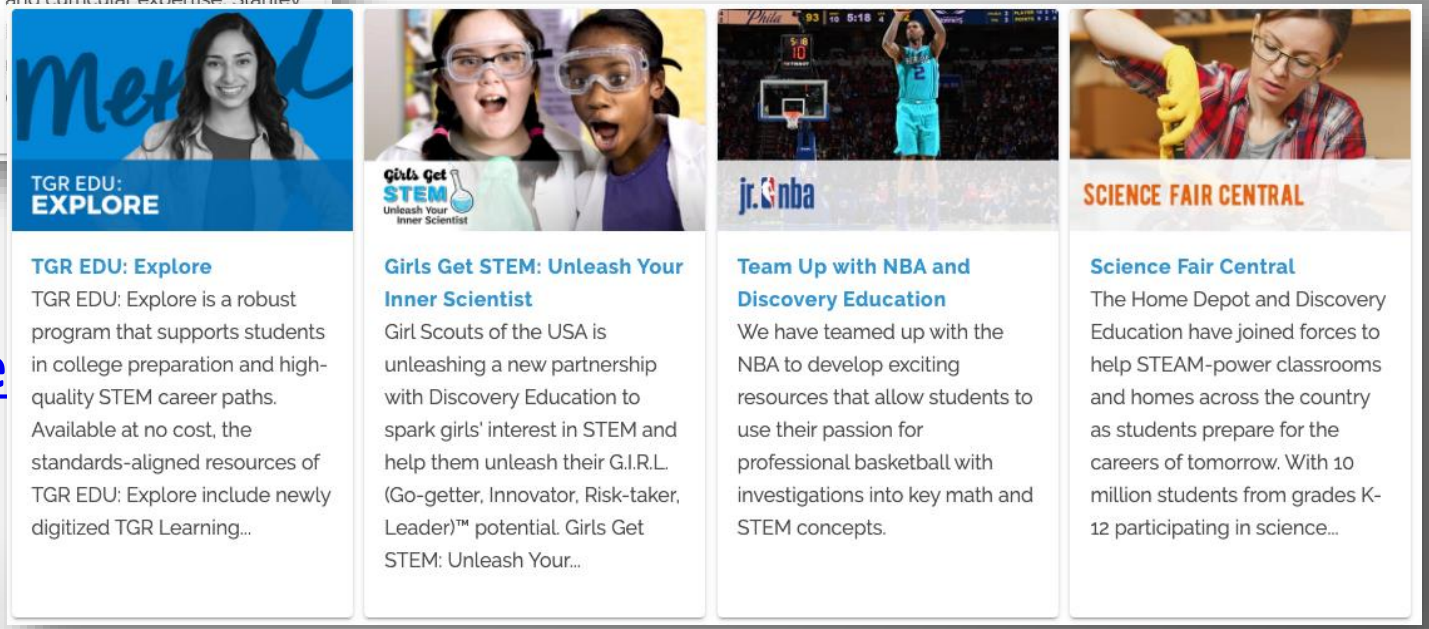


DNA Decoded
The Illumina Foundation and Discovery Education partnered to create DNA Decoded to inspire middle and high school teachers to unlock the power of genomics and impact the future of their students. DNA Decoded provides ready-to-go,...

Navigating Nuclear
This dynamic, standards-aligned program invites students to explore the many applications of nuclear science and its impact on energy, healthcare, food, and the environment through an interactive suite of FREE classroom resources for...

STEMvest
USAA, Texas ASCD, and Discovery Education have teamed up to create STEMvest, a program to strengthen the San Antonio community by elevating the STEM and financial literacy skills of middle school and high school students while providing...

Innovation Generation
Powered by Stanley Black & Decker's tools, employees, maker enthusiasts, and Discovery Education's unparalleled classroom reach and curricular expertise, Stanley



TGR EDU: Explore
TGR EDU: Explore is a robust program that supports students in college preparation and high-quality STEM career paths. Available at no cost, the standards-aligned resources of TGR EDU: Explore include newly digitized TGR Learning...

Girls Get STEM: Unleash Your Inner Scientist
Girl Scouts of the USA is unleashing a new partnership with Discovery Education to spark girls' interest in STEM and help them unleash their G.I.R.L. (Go-getter, Innovator, Risk-taker, Leader)™ potential. Girls Get STEM: Unleash Your...

Team Up with NBA and Discovery Education
We have teamed up with the NBA to develop exciting resources that allow students to use their passion for professional basketball with investigations into key math and STEM concepts.

Science Fair Central
The Home Depot and Discovery Education have joined forces to help STEAM-power classrooms and homes across the country as students prepare for the careers of tomorrow. With 10 million students from grades K-12 participating in science...

www.discoveryeducation.com/corporate-and-non-profits/corporate-education-partnerships/

Kaari Casey

Sr. Program Manager,
Virtual Programs

Contact:
kcasey@nyas.org
516-713-6552

The New York Academy of Sciences

Founded in **1817**, the Academy is an independent, nonprofit organization with Members 100+ countries…

7,000+

Early Career Investigators (undergrads, grad students, & postdoctoral fellows)

5,000+

Young Members (ages 13-19) from over 100 countries

20,000+
ACTIVE ACADEMY MEMBERS ACROSS THE GLOBE

30 NOBEL LAUREATES
INVOLVED IN DIRECTING THE ACADEMY'S PROGRAMMING

A DISTINGUISHED BOARD OF GOVERNORS COMPRISED OF LEADERS FROM BUSINESS, ACADEMIA, AND PHILANTHROPY

The New York Academy of Sciences

The Global STEM Alliance (GSA)

A worldwide initiative to **build** and **diversify** the STEM pipeline.

- **Mentorship from real scientists and engineers**
- **Real world challenges and project based learning**
- **Skills training & professional development**

FIND OUT MORE AT
www.nyas.org/programs

Virtual Programs

The Junior Academy

- Virtual program for exceptional 13–17 year-olds dedicated to STEM and passionate about addressing the world's greatest challenges
- Members collaborate with peers and receive guidance and support from STEM professionals on the Academy's platform, **Launchpad.**
- Design novel solutions to real-world problems through innovation challenges.
- Win a chance to attend the GSA Summit in New York City!

1000 Girls, 1000 Futures

- Virtual STEM program for female students ages 13-17 from around the world
- Connect enthusiastic female mentors with STEM-focused high school girls via an online platform from September- May
- Offers access to real-life role models and innovative programming aimed at helping them to develop essential 21st-century skills

The New York Academy of Sciences

FIND OUT MORE AT
https://www.nyas.org/mentee-opportunities/

Bryan Colahan

bcolahan@projectengin.com
bcolahan@tivertonschools.org

ProjectEngin™

- B.S. in Finance University of Rhode Island
- Masters in Physics Education from Northeastern University
- Team and product management experience in the Financial sector
- High School Teacher for last 11 years with experience teaching Physics, Engineering, and Math
- Passionate about creating experiences in which students can construct their own understanding
- Member AMTA, AAPT, NSTA, RISTA, and STEP (MIT Teacher Enrichment Program)

Why Engineering in the Classroom?

Use Engineering for a Real-World context for Teaching Science:

- Moves science out of the textbook and into the real world
- Empowers young people with a vision for improving their world
- Provides a vehicle for active, problem and project-based learning
- Engineering “habits of mind” are 21st Century skills!
- Highly transdisciplinary

Challenges and Adjustments:

- Monitoring the process throughout project
- Communicating effectively
- Use of Google classroom for feedback loop
- FlipGrid/Padlet for collaboration and communication

Student Work

- Adaptive Design Challenge
  - Students worked with students with disabilities to design an adaptation
  - Empathy driven
  - Voice and Choice
  - Forces and Structural Design
- Chindogu Design Challenge
  - Designing for social distancing
  - They aren't useful but they aren't completely useless either
  - Creativity and communication

Discussion Points

What approaches best support engagement and inclusion?

How can we meet the needs of diverse learners and group (classroom and online)?

How can we foster “power” skills by making PBL and active learning part of the classroom and distance learning experience? What are the challenges/successes in transitioning it to online? (Bryan’s “classroom” experience)

Wrapping It All Up

- Additional audience questions
- Panel members
- Where you can find resources

GlobalMindED

Thank You!

- Kathy Bihrs
  kbihr@tgrfoundation.org
- Kaari Casey – NY Academy of Sciences
  kcasey@nyas.org
- Susanne Thompson
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