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ED STEM Resources

Science, Technology, Engineering, and Math, including Computer Science

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Background
America's Strategy for STEM Education
Secretary's STEM Priority
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Discretionary grants that can support STEM
Free Online Professional Learning and Technical Assistance for
Nita M. Lowey 21st Century Community Learning Centers Grant Programs

Learn more.

135 results for the keyword search: "STEM"

Summertime STEM
...a great time for STEM to inspire students to keep on learning through engaging, real-life and relevant activities. An intentionally designed summer program will help students retain and build new knowledge and skills. In this three-part webinar series, the U.S. Department of Education's (ED) Y4Y technical assistance team will outline... Read More >

Unlocking Possibilities: Bringing STEM to Life
...technology, engineering and math (STEM)! Throughout these webinars you will walk through the Y4Y courses, resources and activities included in the STEM initiatives. Learn about how STEM can be combined with project-based learning and citizen science!
Ruth Ryder

Deputy Assistant Secretary
Office of Formula Grants
Office of Elementary & Secondary Education

oese.ed.gov
Wednesday, March 24, 2021
12 PM - 4 PM ET
Virtual
National Safe School Reopening Summit
Welcome!

The National Center on Safe Supportive Learning Environments (NCSSLE) offers information and technical assistance to States, districts, schools, institutions of higher learning, and communities focused on improving school climate and conditions for learning. We believe that with the right resources and support, educational stakeholders can collaborate to sustain safe, engaging and healthy school environments that support student academic success.

More About Us

In Demand

Receive our weekly newsletter.
COVID-19 Handbook: Volume 2
ROADMAP TO REOPENING SAFELY AND MEETING ALL STUDENTS’ NEEDS

• Conduct active and specific engagement with underserved families.
• Recognize different levels of trust.
• Implement SEL in culturally and racially responsive ways.
• Remove the stigma of mental health.
• Create safe and inclusive environments.
• Close the digital divide.
• Publicly report equity data and ARP ESSER plans.
Our top priority in the coming months must be to work together to continue to safely reopen all schools for in-person learning, beginning with children in grades K-8. The data, and daily experience, show our children need us to find a way to take this step. My career experiences have taught me that education is primarily a State and local endeavor, and I know everyone has performed heroically under these difficult circumstances, taking steps toward reopening and supporting students wherever they are learning.

Our role at the Department is to provide guidance and directions on how to do it safely and equitably. We know the best ideas start with you; together, we can support one another on the safe reopening of our schools, while sharing the lessons learned from this past year. The Safer Schools and Campuses Best Practices Clearinghouse provides resources for communities, schools, educators, and families as we work together to continue to reopen our schools for in-person learning and support the needs of all students, particularly historically underserved students and those who have been impacted greatest by the pandemic.

Miguel A. Cardona, Ed.D., Secretary of Education
THE SUMMER LEARNING & ENRICHMENT COLLABORATIVE

FEDERAL GUIDANCE

RESOURCES TO SUPPORT SUMMER LEARNING & ENRICHMENT

RESOURCES ON ACCELERATED LEARNING
How Summer Programs Can Help Accelerate Student Learning in Mathematics

GUIDANCE FOR CREATING HIGH-QUALITY, EFFECTIVE SUMMER PROGRAMS

Catherine Augustine, PhD
Senior Policy Researcher
RAND Corporation
NSLP is the largest, most comprehensive study of summer learning programs

Launched by The Wallace Foundation in 2011

Desire to understand the implementation and effectiveness of **voluntary** summer learning programs and to provide quality summer opportunities to students

Includes 5 school districts (Boston, Dallas, * Duval County, Pittsburgh, and Rochester) and over 6000 upper-elementary students

Extensive implementation data collected of programming and planning: observations, surveys, and interviews

Outcomes measured over multiple points in time

Longitudinal study conducted over 8 years started with students in 3rd grade

*Included 21st CCLC sites*
NSLP programs included common elements that were anchored in research and expert guidance.

- Full day program for 5 - 6 weeks with academics and enrichment
- Small classes of 15 or fewer students
- Certified teacher focused on academics (3 hours per day)
- Science
- Arts and crafts
- Boating
- Cooking
- Dance
- Fencing
- Rock climbing
- Free meals
- Free transport
- No cost to families
NSLP programs produced academic benefits in math, particularly for high-attenders.

Treatment students outperformed control students on fall mathematics assessment.

High attending treatment students also outperformed control students on spring mathematics assessments.

*We observed these benefits in 4th and 5th grades.*
Target the math curriculum to district standards and student needs

Identify students most in need of a summer experience
  ◦ What are their needs?

Align recruitment, curriculum, and staffing to those needs
  ◦ Invite high-priority students
  ◦ Prioritize learning objectives and align a curriculum to those
  ◦ Ensure staff have the expertise and support to address all student needs
    ◦ Have appropriate supports for students with IEPs or those learning English
    ◦ If students have COVID-related trauma, hire counselors/psychologists and train teachers on how to refer and appropriately manage behavior
Students have to attend to benefit: Benefits accrued after 25 hours of math instruction

Offer academic programs **5-6 weeks**

Offer math for at least an hour a day

Promote regular attendance
- Signal attendance expectations in recruiting material
- Follow-up with reminders about the program
- Create engaging programming that students want to attend
- Maintain a positive site climate
Recommendations for establishing a positive site climate

- Develop a warm and welcoming summer site culture
- Train all staff
  - Culture of the site
  - Behavioral expectations
  - Importance of positive adult engagement throughout the day
- Ensure site leaders observe instructional and noninstructional periods
- Support positive student behavior
  - May require additional staff

*Site climate drives students’ daily experiences, enjoyment of the program, and attendance.*
Fifth publication in our Summer Learning Series specifies these and other recommendations.
Tony Streit

Director
National Center on Afterschool & Summer Enrichment
EDC

dc.org
ED STEM WEBINAR
Summertime STEM

Tony Streit, Managing Project Director
May 4, 2021
EDC at a Glance

Education Development Center, Inc. (EDC), is a global nonprofit that advances lasting solutions to improve education, promote health, and expand economic opportunity. Since 1958, we have been a leader in designing, implementing, and evaluating powerful and innovative programs in more than 80 countries around the world.

1958
EDC was founded by MIT scholars and researchers.

200+
projects managed annually by EDC.

$173.1
million FY21 operating budget

EDC has 1,300 employees.

Funders include USAID, NSF, NIH, MasterCard Foundation, DoEd, and SAMHSA

GLOBAL REACH
EDC has worked in more than 80 countries and in all 50 states in the U.S.

REGIONS
» Africa
» Asia
» Europe
» Latin America and the Caribbean
» Middle East
» United States
• National Training & Technical Assistance (TTA) Center funded by Administration for Children and Families
• Goal is to help increase families’ access to, and the quality of, afterschool and summer child care
• Support for states, territories, and Tribes in implementing the federal Child Care and Development Fund (CCDF)
• CCDF provides subsidies for child care to low-income families so they can work or participate in education or job training
School-Age Data Profiles Database

https://childcareta.acf.hhs.gov/school-age-profiles
Visit the NCASE Resource Library:
https://childcareta.acf.hhs.gov/ncase-resource-library
Summer Learning Fun!

Tips for Parents/Caregivers

School may be out for the summer, but your child’s learning needs don’t take a vacation! Children learn best when they have opportunities to build skills and knowledge across settings. These include summer child care programs as well as time spent at home. Read on for tips on how to engage your child in fun, meaningful learning activities throughout the summer.

1. Talk with your child:
   - Find out what their summer plans are and how they plan to spend their time.
   - Ask about their interests and hobbies and try to incorporate those into their daily routine.
   - Encourage them to read books or articles that interest them.

2. Meet with your child’s teacher:
   - Ask about their summer plans and what they would like you to do over the summer to support their learning.
   - Share information about your family and culture with your child’s teacher.

3. Make a list of activities you can do together that are fun and educational.

Meet with your child’s summer child care provider:

- Talk about your goals for your child’s summer child care.
- Share information about your child’s likes and dislikes.
- Provide information about any specific needs or accommodations they may require.

Tips for School-Age Child Care Providers

Summer is a time for fun and fun, but children’s learning is too important to take a vacation! Many school-aged children lose up to 3 months of grade-level equivalency in math and reading skills over the summer months. This phenomenon is known as the summer slide. As a summer-time child care provider, you can help school-age children and their families make the most of the summer months and avoid the summer slide. Here are some things to think about as you plan for summer.

1. Get to know your families:
   - Talk to families about their child’s interests and hobbies.
   - Share information about your program and how it supports their child’s learning.

2. Before summer:
   - Plan for the summer months.
   - Create a plan for the summer months.
   - Share information about the activities and programs available.

3. Summer program:
   - Provide activities that are fun and educational.
   - Encourage children to practice their skills and learn new things.

4. After summer:
   - Reflect on the summer program and what worked well.
   - Share information about the next steps for the fall.

https://edc.org
Child Care Funding Released in American Rescue Plan

• Grants will be awarded on a formula basis to states, territories, and tribes for two types of ARPA child care funding.
• $15 billion in supplemental Child Care and Development Fund (CCDF) monies.
• $24 billion in Child Care Stabilization Grants.

“This Administration is focused on providing financial relief to this critical sector with an equity lens that recognizes the importance of this sector led by women, and especially women of color.”
– JooYeun Chang, acting assistant secretary and principal deputy assistant secretary at HHS’ Administration for Children and Families

Center for Disease Control Guidelines

- Summer learning programs on school grounds should follow [CDC’s Operational Strategy for K-12 Schools](https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/summer-camps.html).
- Multiple prevention strategies can help camps open safely.
- Describes physical distancing recommendations that aligns with guidance for schools.
- Strategies that programs can use to maintain healthy operation, lower risk of COVID-19 spread, prepare for when someone is sick and support coping and resilience.

**Purpose:** Examine how district-led, publicly funded summer learning programs that serve K-8 aged youth in urban settings access and use professional learning and tools to improve and advance equitable outcomes for the students they serve.

**Examining broader systems of support:**
- Public funding
- State systems of support
- Intermediaries

**Research questions focus on:**
- District policies and practices
- External supports like PD, resources, and tools
- District needs, gaps, and opportunities
- Families and communities
Young Mathematicians

https://youngmathematicians.edc.org

Games for Young Mathematicians is a program of research and development in early mathematics teaching and learning at the Education Development Center (EDC). As part of this work, we are developing tools and resources aimed at supporting young children’s mathematics learning and mastery motivation and examining the effectiveness of interventions that include family math on preschoolers’ school readiness skills.

This work is supported by the National Science Foundation Grants# DUE 1348564, DRL 1907904, and by the Heising-Simons Foundation Grants# 2015-023, 2016-133, 2019-1396, and Overdeck Family Foundation Grant# 2019-1396. Any opinions, findings, and conclusions or recommendations expressed in
Innovative Technology Experiences for Students & Teachers (ITEST)

- Exploration of “Real World” Science
- Blending Formal & Informal Learning Strategies
- Fostering High-End Collaboration within the Community
- Exposure to Careers in the STEM Workforce
- Partnerships with Businesses & STEM Professionals

http://stelar.edc.org
Avoiding Data and Science Misinformation in Today’s Messy Media Landscape

TONY STREIT
Managing Project Director
tstreit@edc.org
Gil Noam, Ed.D.

Director
Institute for the Study of Resilience in Youth
McLean Hospital
Harvard University
2020 Virtual STEM+SED Conference

- Goals
- Key Findings
- Lessons for Summer

This conference was supported by the National Science Foundation under grant #1940155.
Ten Big Bets
Transforming Education During the Pandemic and Beyond
Dr. Gil G. Noam
2018 Study

10 state afterschool networks
110 informal STEM programs
Nearly 1,700 youth
200+ educators
Quality

Dimensions of Success (DoS)

- **Features of the Learning Environment**
  - Organization
  - Materials
  - Space Utilization

- **Activity Engagement**
  - Participation
  - Purposeful Activities
  - Engagement with STEM

- **STEM Knowledge & Practices**
  - STEM Content Learning
  - Inquiry
  - Reflection

- **Youth Development in STEM**
  - Relationships
  - Relevance
  - Youth Voice

Outcomes

Common Instrument Suite - Students

CIS-S: Noam, Allen, Sonnert, & Sadler, 2020; Allen, Noam, et al., 2019
Summer Strengths & Challenges

The “Double Dip” in OST

Mean Evidence Rating

- Organization
- Materials
- Space Utilization
- Participation
- Purposeful Activities
- Engagement with STEM
- STEM Content Learning
- Inquiry
- Reflection
- Relationships
- Relevance
- Youth Voice

2018/Summer, lighter colors (N = 103) (Allen, Noam, et al., 2019; Browne, Noam, & Allen, 2021)
Quality: Linking with Youth Outcomes

Youth STEM Attitudes by Observed Summer STEM Program Quality

Higher Quality = Better Outcomes
Contact Us!

Gil Noam, Ed.D, Ph.D. (Habil.)
Director, ISRY
Associate Professor, Harvard Medical School
Gil_Noam@hms.harvard.edu

Patty Allen, Ph.D.
Sr. Research Manager, ISRY
Instructor in Psychiatry, Harvard Medical School
pallen@mclean.harvard.edu
Gemma Lenowitz
Program Officer
Overdeck Family Foundation
Inspired Minds

Inspiring young minds through out-of-school STEM.
How summer STEM programs scale

Bright spots in partnerships and impact

Data-driven practice
Scaling OST STEM Programming
Maximizing cost-effectiveness and capacity

Access the full paper here
Harnessing Tensions (Transcend, 2021)

- Breadth vs. Depth / Access vs. Quality
- STEM relevance vs. Staff capacity
- Joy vs. Rigor
Bright spots

Mutually reinforcing outcomes

Partnership models
Measurement & evaluation: in service of continuous improvement, sustained impact, equity
Resources:
Visit HelpKidsRecover.org for information about funding, experts in your state, and to explore the evidence base.

Visit the Wallace Foundation’s Knowledge Center on Summer Learning

Visit Overdeck.org for our latest blog posts, funding announcements, and investment criteria. You can also sign up for our newsletter. Programs with a national footprint are welcome to reach out for more info about our grant process.
Nikole Collins-Puri

Chief Executive Officer
TechBridge Girls, Inc.

techbridgegirls.org
Summer STEM for Youth from Marginalized Communities

Nikole Collins-Puri, CEO
Why The Work is Important

**Economic Imperative**

By 6th grade, girls from under resourced communities are **6000 hours behind** their peers in STEM learning.

**Unleashing Full Potential**

- **Native American** >0.5%
- **Latinx** 7%
- **African American** 9%

Current STEM Workforce
- **White & Asian** 82%

**Equity Mandate**

- Since 1990, the need for STEM employment has increased by **79%**.
- Computer-related jobs have increased by as much as **338%**.
Techbridge Girls (TBG) Core Programs

1. We develop and deliver **high-quality, broad-based STEM, equity-focused, and a gender and culturally-responsive curriculum** for 3rd-8th graders OST settings.

2. Our reach is dramatically expanded and our impact amplified through distribution of our **curricula and training to OST providers** (school districts, CBOs, system networks).

3. This strategy helps us **transform the approach and practice of STEM education** all while expanding our community and network to provide girls with greater access and exposure to STEM careers.

---

IGNITE
**Grades 3-8**
Sparking girls’ interest in STEM while building connection and community

INSPIRE
**Grades 4-5**
Building girls’ STEM excitement, joy, and belonging

CHANGEMAKERS
**Grades 6-8**
Uplifting girls’ sense of STEM belonging and agency

GIRL-CENTERED STEM CONFERENCES
**Grades 6-12**
Expanding access to networks, experiences and role models within STEM
STEM Summer = Whole Child Development

Encourages practice mindset, activates all senses, hands-on, experiential, project-based learning

allows educators to...

- Welcome exploration and iteration
- Check-in on youth safety, nutrition and wellness
- Build authentic relationships and provide emotional support
- Build SEL and equity practice

allows youth to...

- Develop peer group to share and support their interests
- Sustain STEM interest, joy and confidence
- Access internet, hardware, software and real world STEM tools
- Combat Summer learning loss
## Our Foundation: Equity Framework

### BEING STEM
- Community building
- STEM stories of BIPOC role models
- SEL tips and resources
- Youth voice tips
- Identity as an asset
- Caregiver connections
- Grouping strategies
- Reflection questions

### DOING STEM
- NGSS standards alignment
- Rooted in Engineering Design Process
- Ungraded, iterative model
- Hands on STEM
- Experiential learning
- Disaggregate Instruction

### USING STEM
- Real World story-based STEM
- BIPOC role models using STEM for social change
- Caregiver connections
- Reflection questions
- Social justice connections
Our Foundation: Voice of Educators & Youth

**Educator’s Experience**
- Delivery expectations
- Supporting curriculum content
- Digital Platform - Participate
- Professional Learning Communities

**Curriculum & Training Building**
- Training schedule
- Racial equity and gender expansiveness conversations
- TBG expansion

**Future**
- Create and organize larger projects
- Inspire 2.0 & Changemakers 2.0
- Growth in membership

"It is well organized and everyone speaks to share their honest perspective, experience and ideas."

"I always look forward to meeting. I really appreciate our community and being able to be a part of something so big."
What Works? Equipping OST Educators

Who Are They?
- Traditional teachers
- Nonprofit program facilitators
- STEM professional volunteers

Building Capacity of Equity Educators
- Combined synchronous and asynchronous through
- Community and peer engagement platform
- Increased equity focus
- Interactive resource hub
- Professional Learning Communities

Making it Turn-Key
- High-quality curriculum; hands-on
- TBG SWAG
- Tinkering Supplies for training
- Recruitment materials
What Works? Flexible & Adaptable

Program Models
- Realistic expectations for learning
- Integration of fun and learning
- Asynchronous and live training through new digital platform
- Flexible and adaptable to in-person/virtual

Make it Scalable
- Turn-key and ease to implement
- On-demand resources
- Access to technical assistance
What Works? An Ecosystem to Support Youth

Volunteer Role Models
- New Role Models Matter (RMM) training!
- Volunteers create video demonstrations
- Volunteers share their STEM journeys

Family Engagement and SEL Kits
- Equity focus
- Activities to utilize resources in classroom
- Home connections sent home with activities
- Caregiver engagement in curriculum

TBG Partnerships
- NSBE SEEK Girl Summer Program is “Techbridgeized”
- STEMNext Statewide Networks - use TBG Ignite STEM programming and RMM training
How to Partner with us?

1. **Summer - NSBE & Techbridge Girls Summer SEEK camp**
   - For middle school-aged girls from DC, Houston, Bay Area, and New Orleans
   - Topics: Robotics, coding, and drones
   - July 19 to Aug. 6

2. **Summer - Role Models Matters 101 training for volunteers**
   - For partners connected to the Million Girls Moonshot and the Statewide Afterschool Networks
   - Updated on-demand video, now including more verbiage on equity and implicit bias

3. **Summer - Ignite**
   - For partners connected to the Million Girls Moonshot and the Statewide Afterschool Networks

4. **School Year - Afterschool Program Packages**
   - Virtual and in-person options for girls from 3rd to 8th grades
   - Broad STEM curriculum with focus on equity, SEL, social justice
   - Includes intensive training and pre-kitted materials

5. **School Year - Expanding Your Horizons One-Day STEM Conferences**
   - Middle School-aged girls
   - 13 states and growing!

For More Information: VP, Growth & Partnerships, Meeta Sharma-Holt: msharmaholt@techbridgegirls.org
Zenae Campbell
Vice President
Program Services & Club Operations
Boys & Girls Clubs of Greater Houston

bgcgh.org
Boys & Girls Clubs of Greater Houston

**Mission:** To inspire and enable all youth, especially those who need us most, to realize their full potential as productive, responsible and caring citizens.

- 23 Clubs Across 5 county region of Greater Houston
- Serving K-12 youth primarily – young people of color and from underserved communities
- 30K+ young people served per year
- 54% Males and 46% Females

Boys & Girls Clubs Formula for Impact
The Power of Program & Partner Alignment

• Public Partnerships: 21CCLC- Texas ACE & Schools
  • School district alignment
  • Whole Family Model – access, engage, educate, & empower
  • Virtual Engagement – OnDemand & Virtual Club Experiences

• Collaborative Partnership: Imagine Science
  • Collaborative programming and implementation
  • Cross-Collaboration / Training on NEW Curriculums

• Corporate Partnership: Phillips 66 STEAM Works
  • Focused on industry
  • Enhanced experiences
  • Leveraged supports for sustainability
Summer is the Optimal Programming Season

- 96% young people of color
- 54% females engaged in STEM Learning
Utilizing STEM for RESILIENCY

- Integration of social emotional learning (SEL)
- Project-based learning & hands-on opportunities
- Confidence & Grit & Collaboration
- Exploration & Empowerment
- Persistence to completion
- Supporting healing through expression
What we have *Learned*

- Collaboration is necessary for impact.
- Be intentional and create shared outcomes for the greatest impact.
- This work is sustainable!
- This work is preparing young people for college, career,& beyond.
- The programming is FUN for young people.
- Mastery will happen...
What we have Learned

51% of Imagine Science Houston youth reported increased STEM Career Interest compared to 42% in PEAR’s national dataset (2019-2020).

47% of Imagine Science Houston youth reported increased STEM Identity compared to 46% in PEAR’s national dataset (2019-2020).

82% of BGCGH girls are curious to learn more about STEM.

BGCGH 21CCLC students had, on average, better academic grades in each of the four core courses included here (i.e., reading, math, science, and social studies), as well as the aggregate measure of overall grades.
Our Contact

Zenae Campbell, Boys & Girls Clubs of Greater Houston
Vice President, Program Services & Club Operations
Mobile: (916) 533-2928
Email: zcampbell@bgcgh.org
www.bgcgh.org

Other resources:
https://bgca.org/
https://www.summerlearning.org/
https://www.nasa.gov/stem/foreducators/k-12/index.html

Doing Whatever it Takes to Build Great Futures!
Every Child can invent

INVENTING IS A MINDSET

INVENTING IS INSPIRED

INVENTING IS FOR EVERYONE

INVENTING STARTS HERE

INVENTING IS FUN

INVENTING IS ATTAINABLE

EVERY CHILD CAN INVENT

INVENTING IS WORLD-CHANGING
“Everything involved with this program is so thought out and **easy to use or adapt** to what you need...The conversation that was sparked by students was amazing!”

Jessica Curley, Coach
I see myself as a problem-finder and a problem-solver.
AMERICAN STIMULUS FUND

EXCELLENT PROGRAM FOR STUDENTS
EMBRACE FULL RANGE OF EMOTIONS
GROUNDED IN PURPOSEFUL AND FACILITATED DIALOGUE
ENCOURAGES COLLABORATION

RELIES ON PLAY FOR LEARNING
EMPOWERS THE USE OF THE IMAGINATION
USE OF OPEN-ENDED MATERIALS

WE MAKE IT SIMPLE
THANK YOU!

Contact us for more information:

Britt Magneson
Phone: 330-388-0683
Email: bmagneson@invent.org
www.invent.org
LET'S GET STARTED!

Scan the code to learn more and receive your free whitepaper on Using Invention Education to Develop SEL Skills!
Resources

- American Rescue Plan Education Fact Sheet
- Y4Y.ed.gov, Summertime STEM Webinars, STEM Initiatives, STEAM
- Summer Learning & Enrichment Collaborative
- WWC | Structuring Out-of-School Time to Improve Academic Achievement
- Key Principles for Expanding Learning to Support Student Re-Engagement
- Evidence-Based Strategies for Quality Afterschool & Summer
- The Connectory
- Summer Learning Toolkit
- Summertime Experiences and Child and Adolescent Education, Health, and Safety
- Investing in Successful Summer Programs
June 18
12-1:30 pm ET

Advanced Manufacturing Education...
from Elementary to Postsecondary

ed.gov/subscriptions