



STEM & Your Program Using Y4Y

Illinois 21st CCLC Spring Conference

Normal, IL – May 9, 2019



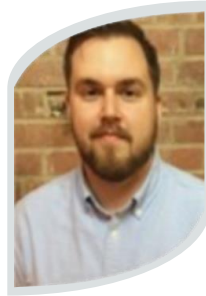
DISCLAIMER



STEM



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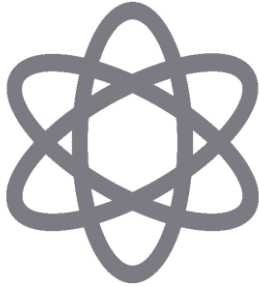
SESSION OBJECTIVES

- Identify Y4Y resources that assist with science, technology, engineering, and math (STEM)
- Review the components of successful STEM programming
- Develop strategies to implement STEM in your program

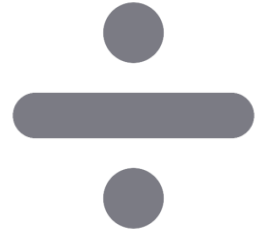




UNDERSTANDING STEM



- Science
- Technology
- Engineering
- Mathematics





CLOSING THE STEM GAP

Good News...

- 60% of new jobs this century will be in STEM fields
- 25% of high school students indicated interest in pursuing a degree in STEM


...Not So Good News

- Only 20% of U.S. workforce will be equipped with skills and education for these new STEM positions
- Only 16% of graduating seniors are both proficient in math and interested in a STEM career






MAKING THE TIME



You for Youth | STEM 1

Dedicating Time

When will you schedule STEM? Keeping simple basic materials available should be the everyday norm. In addition, many STEM elements can be worked into program times such as snack and homework. During snack time, committees can present weather and news reports (including vocabulary, measurement, presenting data, giving reasons), conduct surveys, and manage distributions and menus. During homework time, students can do hands-on projects to supplement classroom learning, or homework time can begin with mental math contests, puzzles, or guessing games. Homework is also a good time for vocabulary expansion and questioning. Physical education can include sports stats, outdoor explorations, counting, and measurement, and enrichment time is wide open for a range of exciting options.





You for Youth | STEM 1

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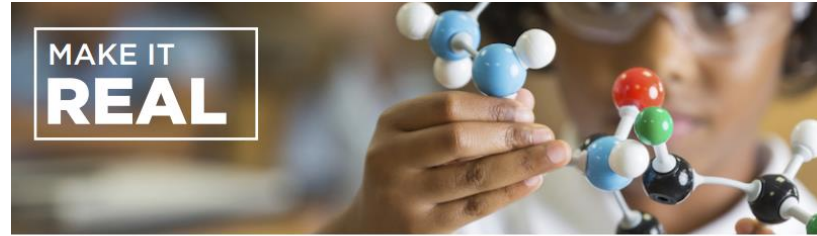
When will you schedule STEM? You can plan to have activity centers available every day for more in-depth projects or club time. Or you may have dedicated STEM activities for more than once a week. The key is to map out times and maximize STEM.

Tuesday	Wednesday	Thursday	Friday

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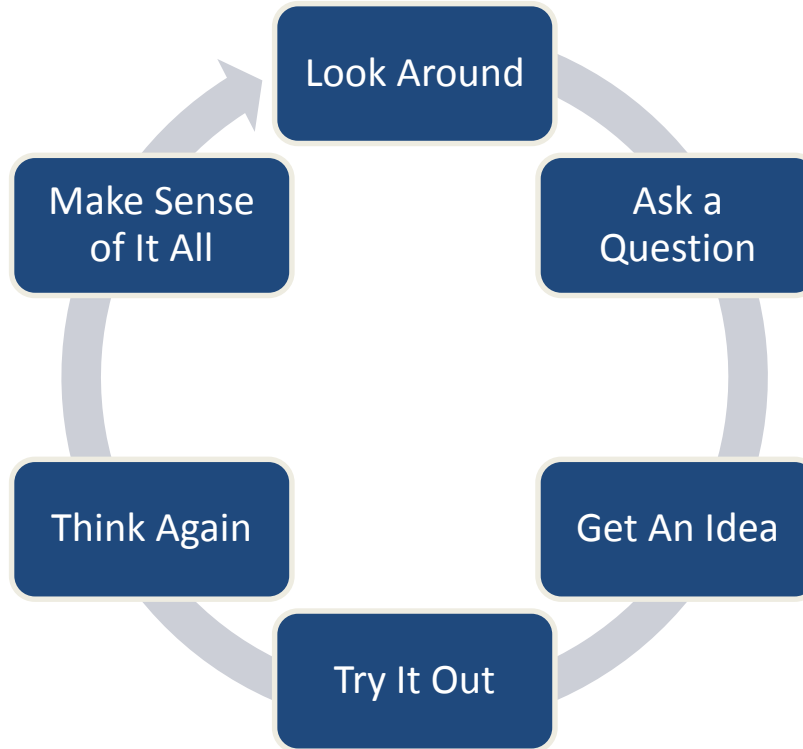
PLANNING STEM ACTIVITIES



STEM



STEM PROCESS



Teach/ STEM/ STEM Everyday Training to Go



STEM



WAYS TO ALIGN

- Understand what students are learning in school
- Collaborate with school-day staff
- Build background knowledge





ALIGNING TO STANDARDS

Activity	Grade level(s)	Skills, Concepts, and Standards
Learning about Tadpoles	K-2	LS1.B (NGSS) Animal life cycles, how animals adapt to survive
Three Billy Goats Gruff	3-5	3-5-ETS1-1 (NGSS) Basic principles of engineering
Balls and Tracks	6-8	MS-ETS1-4 (NGSS) Understanding the design process
Heavy Weight Lesson	9-12	HS-LS3-1; HS-LS3-2 (NGSS) Cause and effect, collecting and analyzing data

Tools/ STEM/ Plan and Implement



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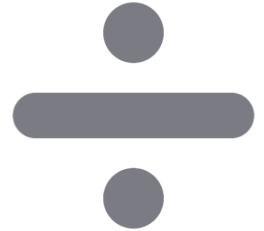


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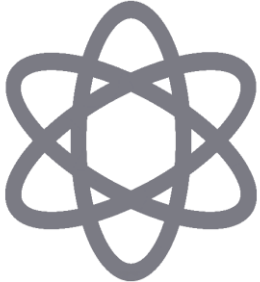
Technology



Mathematics



Science



Engineering





S IS FOR SCIENCE



Scientific literacy

- Ability to use knowledge in the sciences to understand the world





SALT & PEPPER

How can you separate a salt a
pepper mixture?





DEBRIEF

Why were you able to separate the salt and pepper?

Static electricity created:

1. A current ran that through the spoon and repelled the salt.
2. Negative electrons on the spoon that attracted the positive charges within the pepper.
3. Positive charges on the spoon that repelled the negative charges in the salt.





T IS FOR TECHNOLOGY

- Technological literacy
- Computer science literacy
- Computational thinking





COMPUTATIONAL FAIRY TALES

Computer science concepts through fairy tales.

Explaining algorithms:

- The Ant and the Grasshopper: A Fable of Algorithms
- Hunting Dragons with Binary Search
- Binary Searching for Cinderella



ONLINE INTERACTIVES



- NASA Kids Club
- Brain Games
- PBS Learning Media
- Code.org



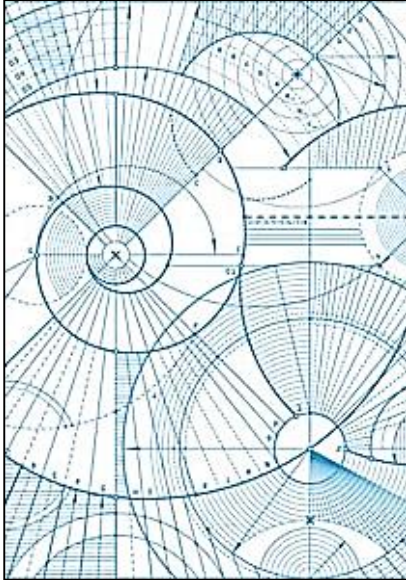
Tools/ Learn More Library/ Web-based Resources



STEM



E IS FOR ENGINEERING



Engineering literacy is the ability to put scientific and mathematical principles to practical use.





HOUSE OF CARDS

Building Rules:

- Test the strength and stability of a square, arch, and triangle.
- Select the one shape you will use to build your house.
- Your building must be at least four stories high.
- You cannot lay a shape on its edge, but you can tape shapes together.
- A paper plate will go on top to hold the marbles

Materials:

- 50 Index Cards
- One roll of tape
- Marbles



M IS FOR MATHEMATICS



Mathematical literacy is the ability to analyze and communicate ideas effectively by posing, formulating, solving and interpreting solutions to mathematical problems.





MATH IN RESTAURANTS

The screenshot shows the 'Get the Math' website interface. At the top, there is a navigation bar with links for HOME, THE CHALLENGES, VIDEO, ABOUT, and TEACHERS. A search bar is located on the right side of the navigation bar. Below the navigation bar, the main content area is titled 'Math in Restaurants' with a sub-link 'Take the challenge'. The main content area features a large image of a chef in a kitchen with the text 'GET THE math IN RESTAURANTS' overlaid. Below the image, there is a text box that reads: 'In the restaurant business, pricing menu items can be tricky because the cost of ingredients is always changing. Your challenge is to look at prices from the past 3 years to predict what avocados might cost in the next year. Then, using this prediction, recommend a menu price for guacamole for next year.' To the right of the main content area, there is a sidebar with a table of contents. The sidebar includes a search bar, a 'go' button, and a list of links: Introduction, Take the challenge (highlighted in red), See how the teams solved the challenge, Try other restaurant challenges, Related, Math in Music, Math in Fashion, Math in Videogames, Math in Special Effects, and Math in Basketball. At the bottom of the sidebar, there is a 'Meet the Teams' section with two small portrait photos of people.

HOME THE CHALLENGES VIDEO ABOUT TEACHERS

Search Get the Math go

Math in Restaurants

[Take the challenge](#)

GET THE math IN RESTAURANTS

In the restaurant business, pricing menu items can be tricky because the cost of ingredients is always changing.

Your challenge is to look at prices from the past 3 years to predict what avocados might cost in the next year. Then, using this prediction, recommend a menu price for guacamole for next year.

Introduction

Take the challenge

See how the teams solved the challenge

Try other restaurant challenges

Related

Math in Music

Math in Fashion

Math in Videogames

Math in Special Effects

Math in Basketball

Meet the Teams

Tools/ Learn More Library/
External Videos



STEM



STRATEGIES AND TECHNIQUES



You for Youth | STEM

Strategies and Techniques

Choose overall strategies and specific techniques that fit your students, resources, time, and staff. Recognize that you can use multiple strategies at the same time, or use different strategies at different times. Over the course of the year, for example, you may move from less intensive to more intensive programming for STEM.



You for Youth | STEM

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Strategies and Techniques

Choose overall strategies and specific techniques that fit your students, resources, time, and staff. Recognize that you can use multiple strategies at the same time, or use different strategies at different times. Over the course of the year, for example, you may move from less intensive to more intensive programming for STEM.

The most important step is to make STEM an integral part of your ongoing program.

Assess the strategies and techniques below as readily doable, somewhat complex, or challenging from the standpoint of your program, feasibility, and time. Commit to increasing STEM short and long term.

	Readily doable	Somewhat complex	Challenging
Increase Exposure with Everyday Activities			
Provide simple materials such as blocks, boxes, measuring spoons, cups, graph paper, construction paper, scissors, shapes, and puzzles			
Set up activity centers for explorations with varied materials or structured activity kits			
Other			



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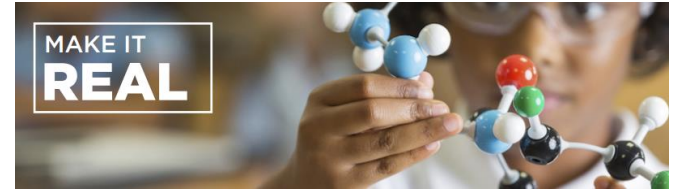


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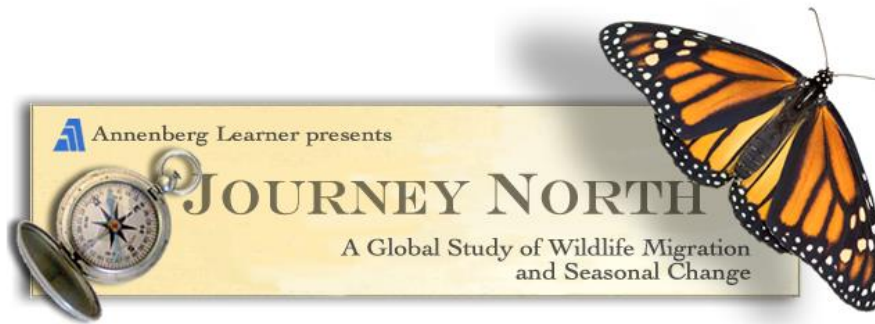
CITIZEN SCIENCE

- Meaningful connections
- No single “right” answer
- Inquiry-based learning
- Data used by scientists





JOURNEY NORTH



Welcome to Journey North!

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[About](#)

[News](#)

[This Season](#)

[Report a Sighting](#)

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Monarch Butterflies



CITIZEN SCIENCE

REFLECTION



What techniques and strategies for STEM do you want to integrate?





The screenshot shows the website's navigation bar with links for HOME, GET STARTED, LEARN, TECHNICAL ASSISTANCE, RESOURCES, and STEM INITIATIVES. The main header features the 'You for Youth' logo and the text 'Online Professional Learning and Technical Assistance for 21st Century Community Learning Centers'. Below the header, the breadcrumb trail reads 'Y4Y > Courses > STEM'. There are links for 'Contact Us | Join' and a 'Sign In' button, along with a search bar. The main content area is titled 'STEM' with a microscope icon. It lists four categories: 'Introduction to STEM', 'Implementation Strategies', 'Coaching My Staff', and 'Tools'. A 'My Notebook' section on the right provides information on how to use the site's note-taking feature. A 'Glossary' section is also visible at the bottom right.

HOME GET STARTED- LEARN- TECHNICAL ASSISTANCE RESOURCES- STEM INITIATIVES-

You for Youth

Online Professional Learning and Technical Assistance for 21st Century Community Learning Centers

Y4Y > Courses > STEM

Contact Us | Join Sign In Search

STEM

Introduction to STEM →

Learn about the potential of science, technology, engineering and mathematics (STEM) topics for enhancing 21st CCLC programs. Learn how to find local help and resources to support your STEM programming and how to coordinate with school-day partners.

Implementation Strategies →

Expand STEM in your program with practical steps to increase STEM-based learning experiences, connect with school content, find time, and tap resources.

Coaching My Staff →

Find resources for staff development on STEM, including links to trainings, tips, tools and pointers to use now.

Tools →

Find ready-to-use, customizable tools that can help launch STEM program planning and implementation.

My Notebook

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH

The Notebook is a useful way to jot down notes as you go through the various topics available on the **You For Youth** website. If you'd like to use the notebook, please [sign in](#) if you already have an account or [register now](#) to join the Y4Y community!

Glossary

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH





CONTACT US



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