STEM & Your Program Using Y4Y

Illinois 21st CCLC Spring Conference

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YOU FOR YOUTH

DISCLAIMER

YOUR FACILITATORS

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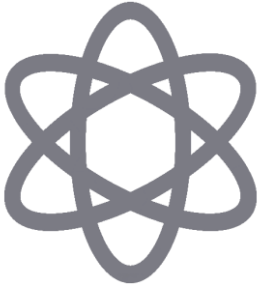
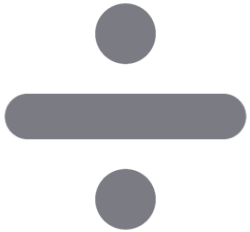
SESSION OBJECTIVES

- 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

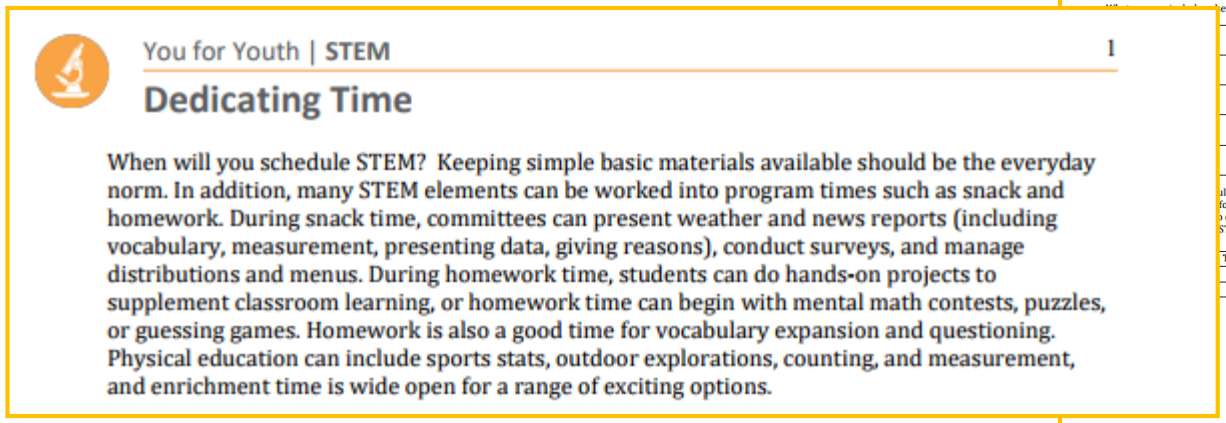
Good News…

- 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

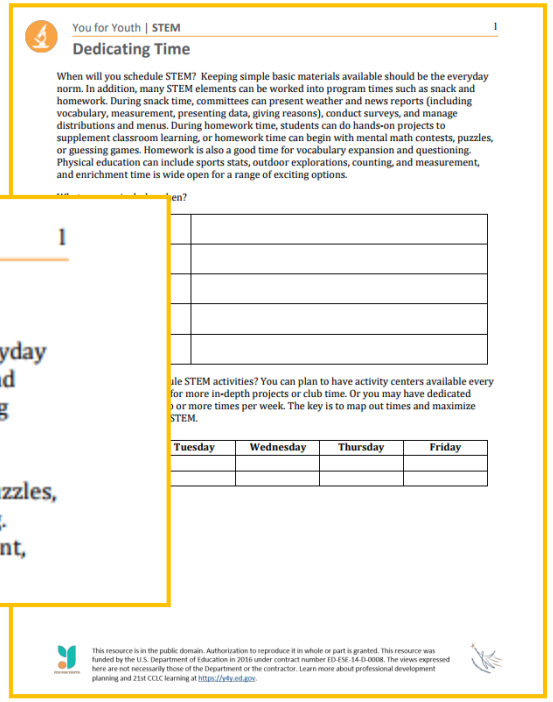
MAKING THE TIME



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.



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le STEM activities? You can plan to have activity centers available every for more in-depth projects or club time. Or you may have dedicated or more times per week. The key is to map out times and maximize STEM.

Tuesday	Wednesday	Thursday	Friday

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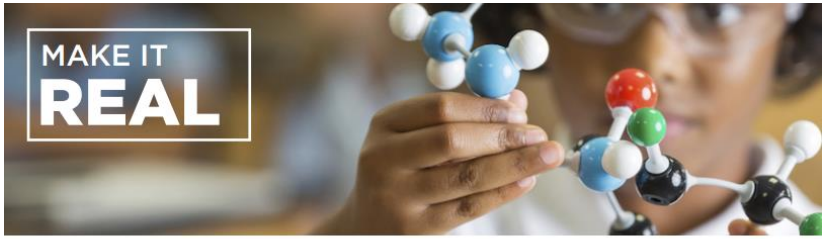
Tools/ STEM/Plan and Implement

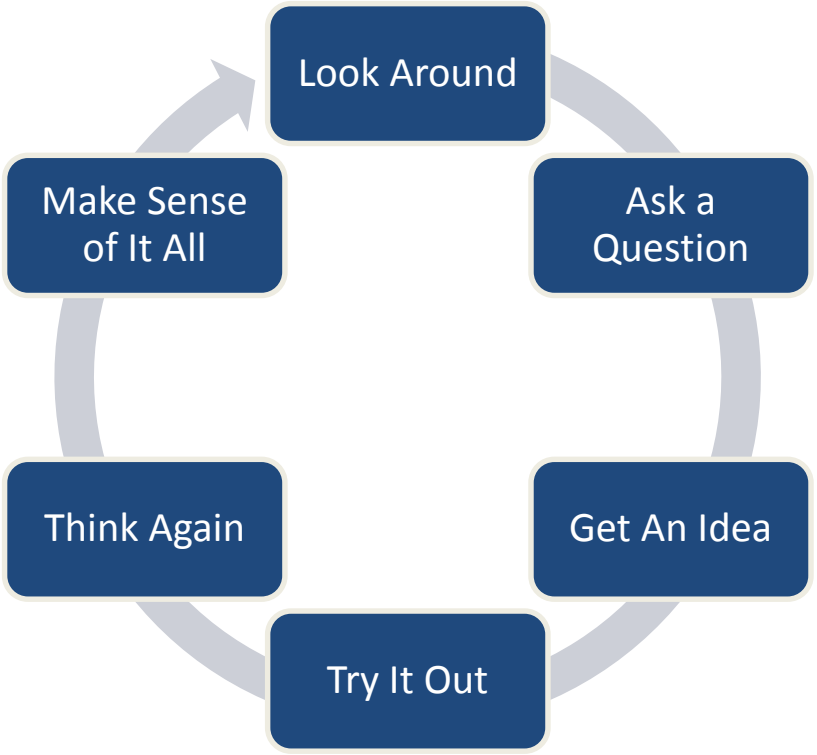
PLANNING STEM ACTIVITIES

YOU FOR YOUTH



STEM PROCESS

Teach/ STEM/ STEM Everyday Training to Go



WAYS TO ALIGN

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

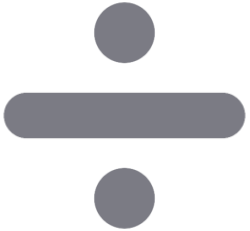
ALIGNING TO STANDARDS

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

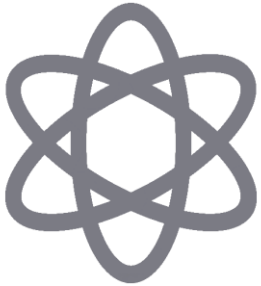
STEM

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

YOU FOR YOUTH

Computer science concepts through fairy tales.

Explaining algorithms:

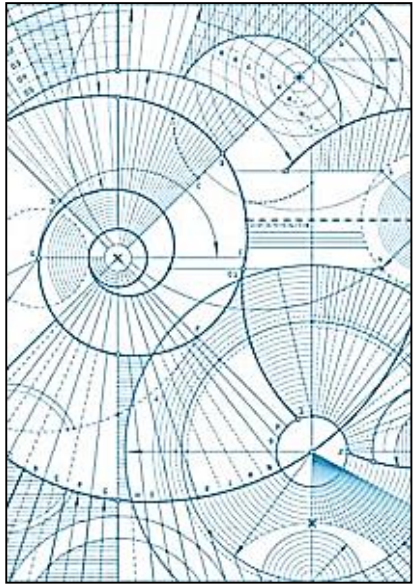
- The Ant and the Grasshopper: A Fable of Algorithms
- Hunting Dragons with Binary Search
- Binary Searching for Cinderella

ONLINE INTERACTIVES

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

Tools/ Learn More Library/ Web-based Resources

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

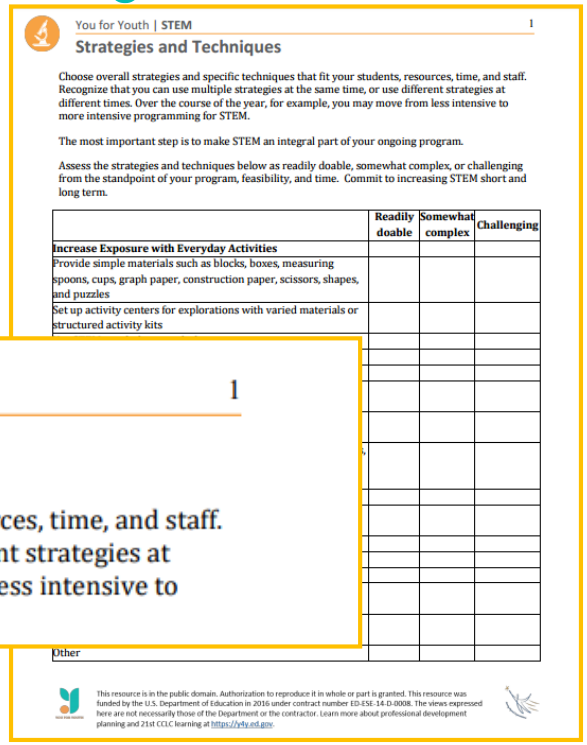
M IS FOR MATHEMATICS

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

MATH IN RESTAURANTS

Tools/ Learn More Library/
External Videos

STRATEGIES AND TECHNIQUES



You for Youth | **STEM** 1

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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You for Youth | **STEM** 1

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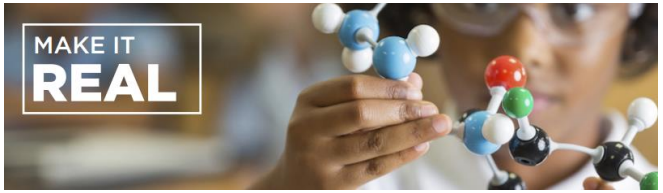
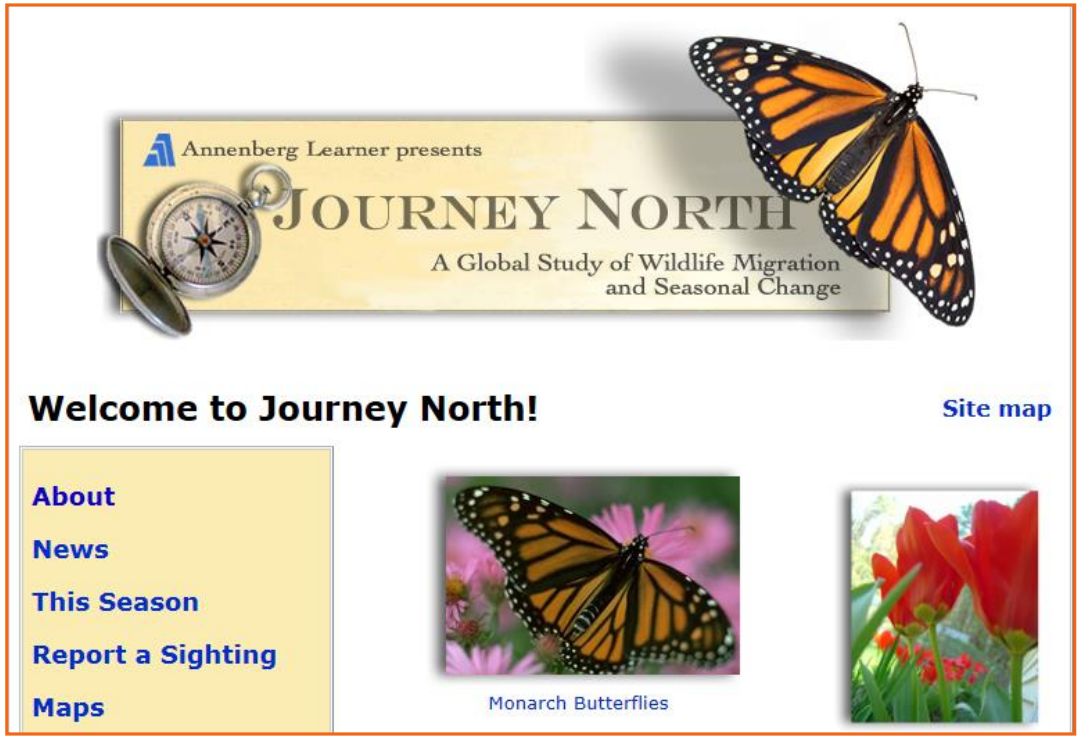
CITIZEN SCIENCE

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



JOURNEY NORTH



REFLECTION

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

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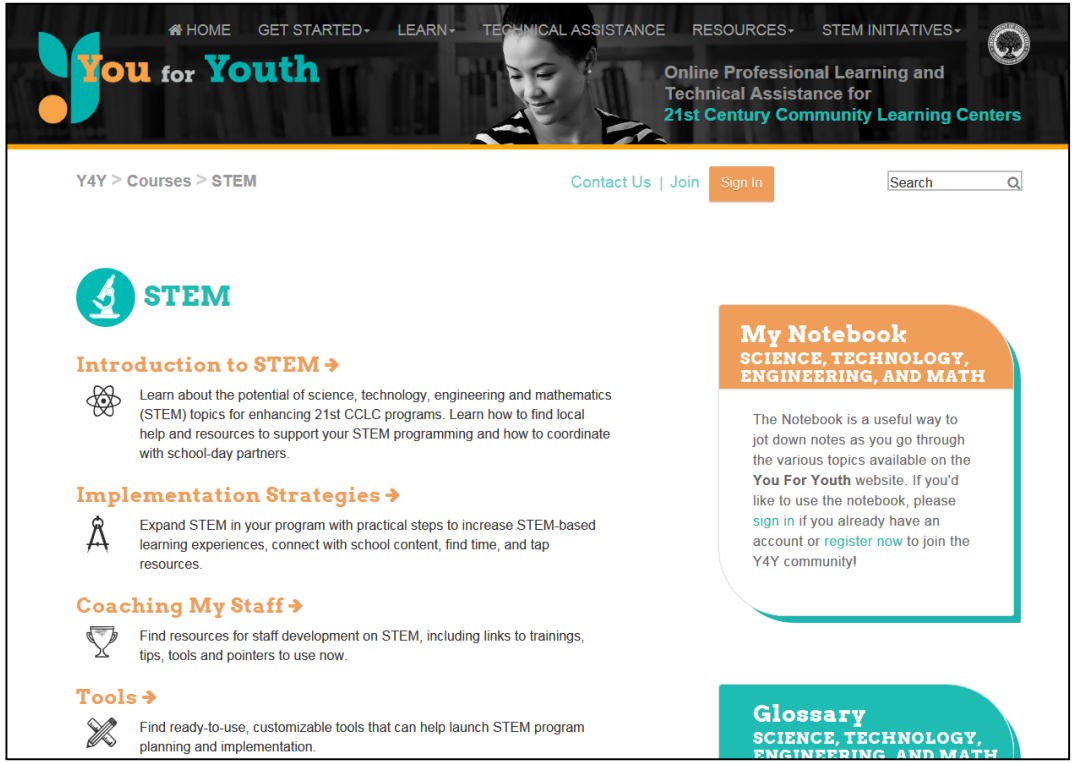
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RESOURCES
STEM INITIATIVES
You for Youth
Online Professional Learning and Technical Assistance for 21st Century Community Learning Centers
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STEM
Introduction to STEM
Learn about the potential of science, 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,

CONTACT US

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