

STEM in the Library

Yes, You Can!



What is STEM?

SCIENCE

TECHNOLOGY

ENGINEERING

MATHEMATICS



What is STEM?

SCIENCE

TECHNOLOGY

ENGINEERING

ART

MATHEMATICS



Why do STEM in the library?





18 min/day (on average)

2018 National Survey of Science and Mathematics Education

<https://horizon-research.com/NSSME/2018-nssme>



“[C]reating time for science ... give[s] students the space and opportunity to build knowledge, interact with classmates, problem-solve, and engage in important content at an age when they are at their most curious.”

<https://www.edutopia.org/article/focusing-science-elementary-students-year/>

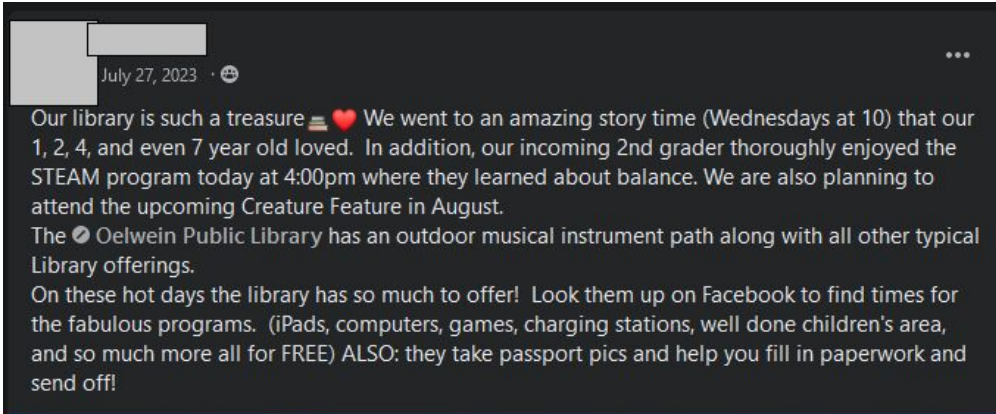
STEM education develops:

- Critical thinking
- Teamwork
- Creative problem solving
- Project management
- Innovative thinking
- An understanding of the scientific method
- Confidence that stems from achievement

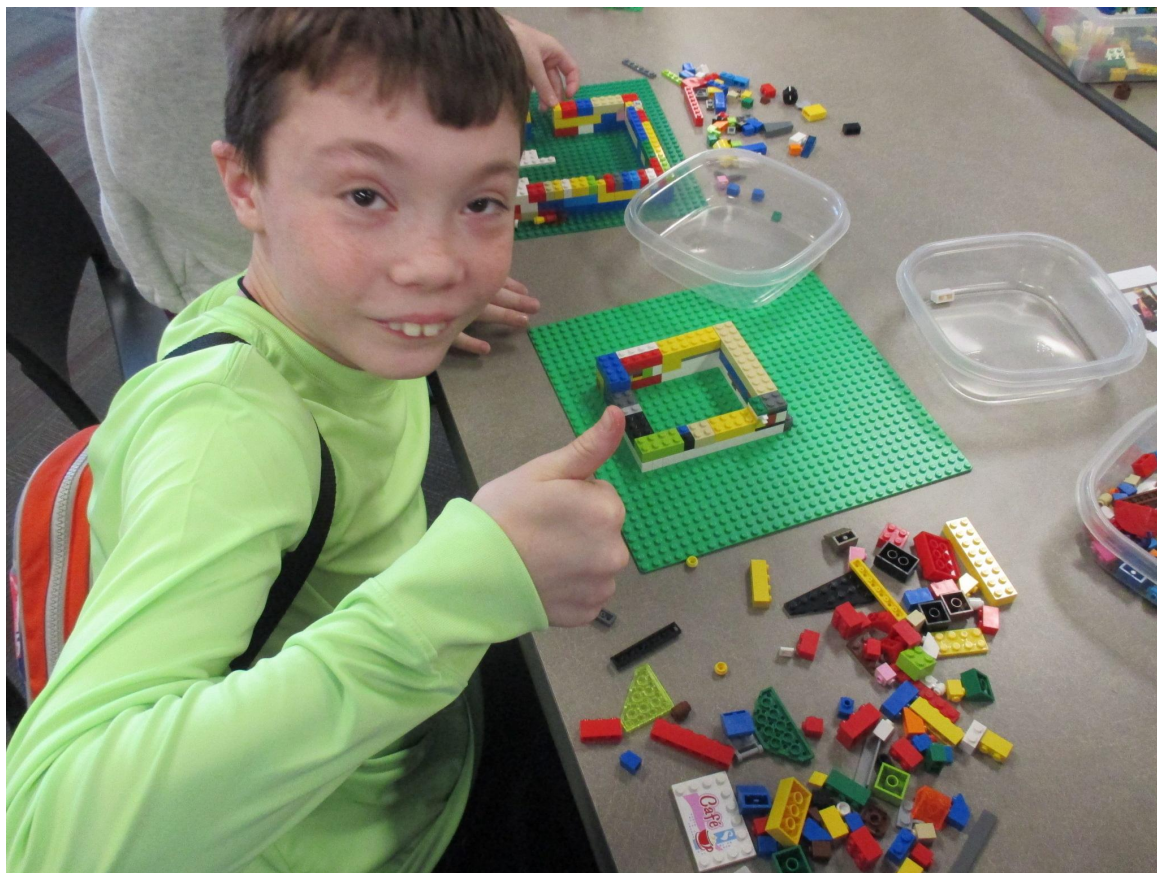
<https://yetiacademy.com/elementary-students-need-stem/>







It gives kids
something
to do!



It's fun!

Getting Started With STEM





It's not teaching, it's facilitating

TREVOR MACKENZIE
WITH REBECCA BATHURST-HUNT

INQUIRY MINDSET

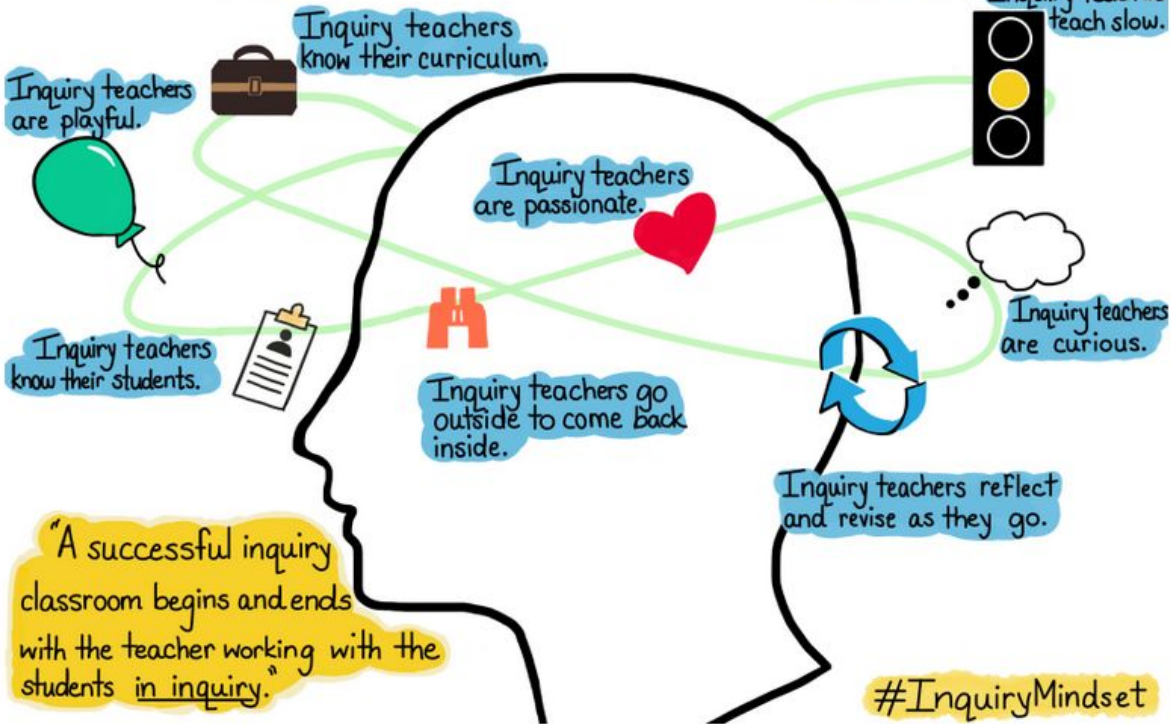
NURTURING THE DREAMS,
WONDERS, & CURIOSITIES OF
OUR YOUNGEST LEARNERS



The Inquiry Teacher

@trev_mackenzie

@rbathursthurt



The Four Pillars of Inquiry

By: @trev_mackenzie

INQUIRY

Explore a Passion



Aim for a Goal



Delve into Your Curiosities



Take on a New Challenge



Prior Knowledge

Student Motivation

Depth of Understanding

Connections to the World

Student Agency

Enriched Experiences

@rbathursthurt



THE FOUR PILLARS OF INQUIRY

Exploring a passion allows a student or group of students to embark on inquiry researching something they are passionate about.

Aiming for a goal guides students working toward achieving a specific goal or provides a framework for an inquiry teacher to meet a curriculum standard, learning target, or objective.

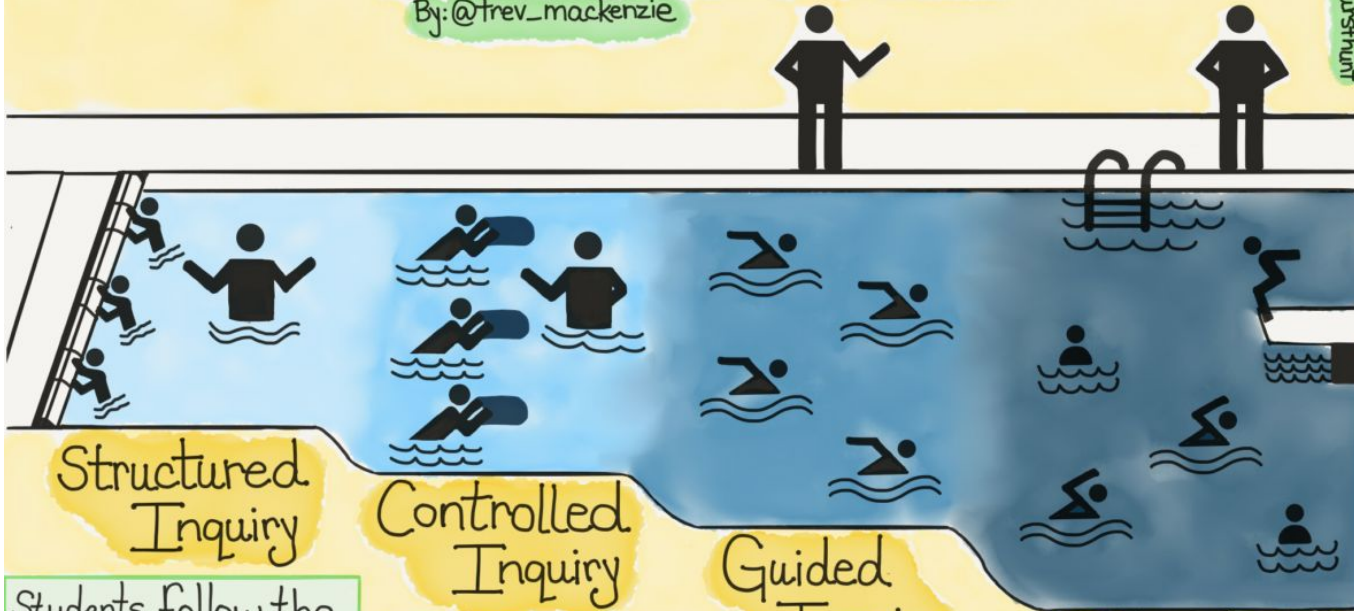
Delving into your curiosities occurs when inquiry begins from students' curiosities developed from a particular provocation, wondering, activity, or experience.

Taking on a new challenge is a great way to incorporate learning a new skill, creating, designing, or building into inquiry experiences.

Types of Student Inquiry

By: @trev_mackenzie

@rbooth-usshunt



Structured Inquiry

Students follow the lead of the teacher as the entire class engages in one inquiry together.

Controlled Inquiry

Teacher chooses topics and identifies the resources students will use to answer questions.

Guided Inquiry

Teacher chooses topics/questions and students design product or solution.

Free Inquiry

Students choose their topics without reference to any prescribed outcome.

Inspired by: Fitchman, 2011

Teacher Librarian: Your Inquiry Superhero

@trev_mackenzie

@rbathursthurt

Teacher Librarians...

Help learners begin to use language that promotes collaboration.

Help learners begin to understand and communicate their learning needs.

Help learners understand the library space and empower them in it.

Design their space with inquiry in mind.

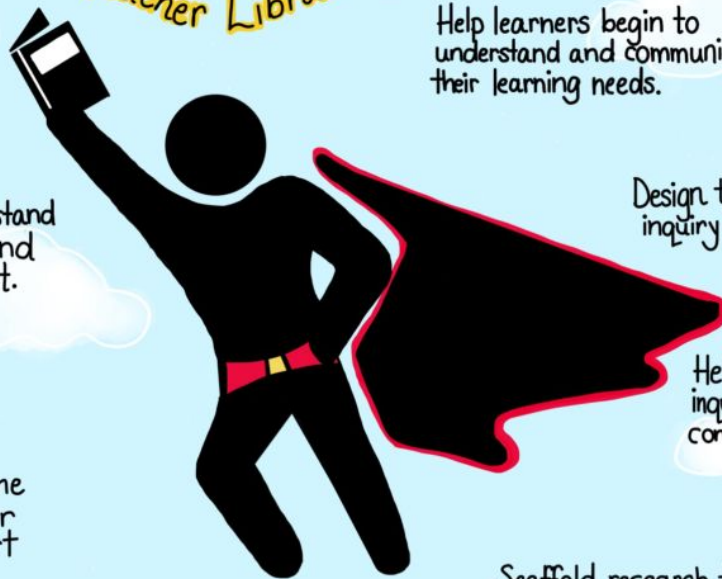
Help learners take inquiry into the community.

Are mindful of their time and divide it up with their growth goals at the heart of their position.

Help colleagues in their inquiry plans.

Scaffold research to nurture strong research skills.

#InquiryMindset





GOVERNOR'S STEM ADVISORY COUNCIL

dedicated to building a strong STEM education foundation for all Iowans

<https://iowastem.org>



STEM
SCALE-UP
PROGRAM

<https://iowastem.org/Scale-Up>



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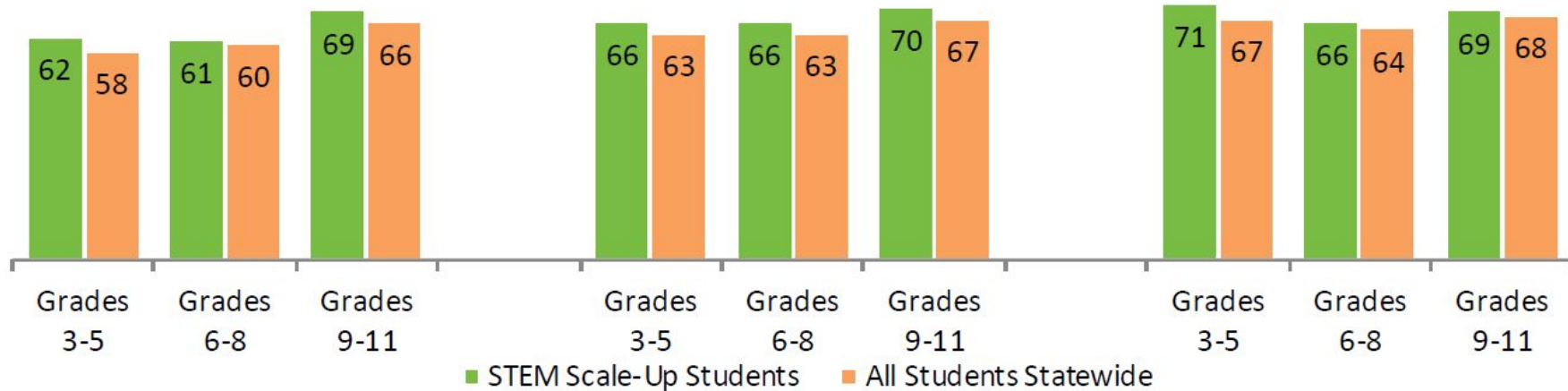
Southeast
Matt Stier
University of Iowa & Kirkwood
Community College
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Mathematics

Science

Reading



PAST SCALE-UP PROGRAM MENUS

2023-2024 STEM Scale-Up Program Menu

- Codelicious
- Daily Math Fluency Centers
- Discover Drones
- Innovate-IT
- Ioponics
- Iowa Leadership in Engineering Design
- Positive Physics and Chemistry
- Python for the BBC micro:bit
- STEM Cart: K-12+ Schoolwide STEM Solution
- STEM Innovator
- Storytime STEM-packs: STEM + Computer Science
- Tiny Techies
- Waterworks: Engineering and Investigating the Properties of Water

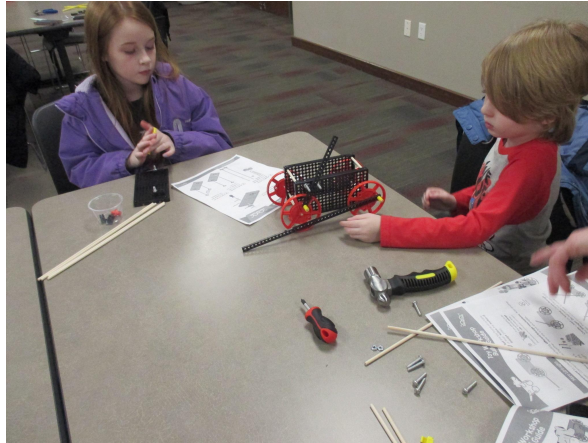
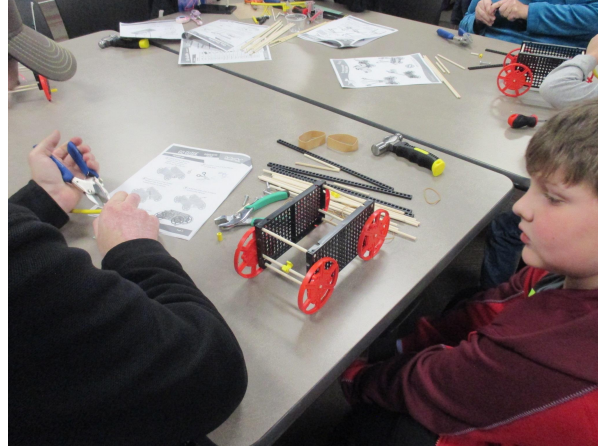
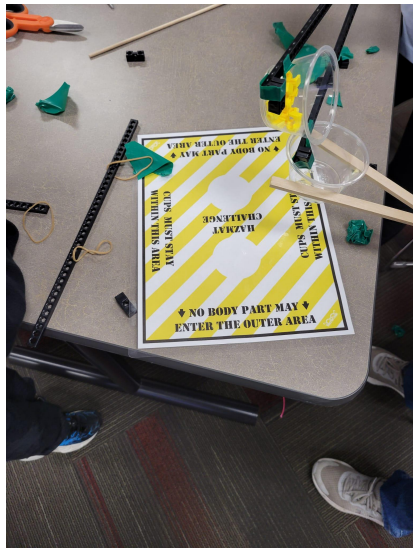
2022-2023 STEM Scale-Up Program Menu

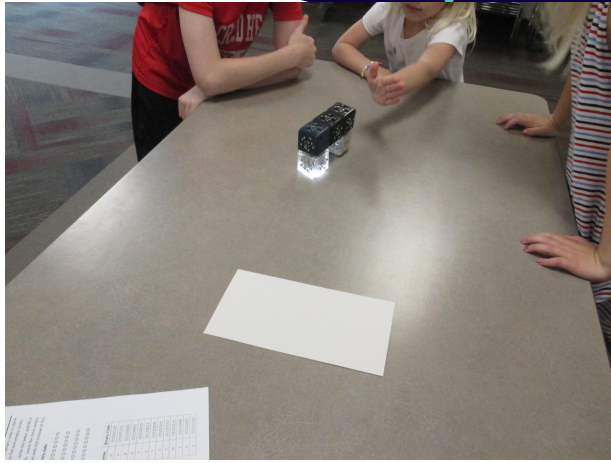
- Computational Thinking in Action with micro:bit
- Daily Math Fluency
- Ioponics
- Iowa Leadership in Engineering Design
- Nepris: Real World Connections to STEM Career Professionals
- Project GUTS
- Project Lead The Way: Energy and Environment
- Ready, Set, Drone!
- Robot Investigations with Finch Robot
- SoapyCilantro: Introduction to Precision Health and Agriculture
- Storytime STEM-packs: STEM + Computer Science
- Tiny Techies
- Waterworks











STEM To Go

Bugs & Butterflies

Ages: 3 - 6



[View in Catalog](#)

Colors

Ages: 3 - 6



[View in Catalog](#)

Construction

Ages: 3 - 6



[View in Catalog](#)

Trucks & Tools

Ages: 3 - 6



[View in Catalog](#)

Farms

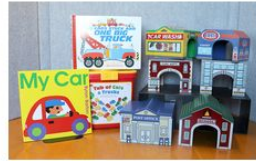
Ages: 3 - 6



[View in Catalog](#)

Things That Go!

Ages: 3 - 6



[View in Catalog](#)

Let's Go Code

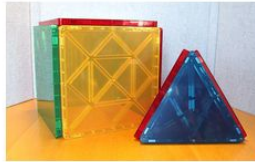
Ages: 3 - 6



[View in Catalog](#)

Jumbo Magnetic Tiles

Ages: 3 - 6



[View in Catalog](#)

Roll & Race Activity Ramp

Ages: 3 - 6



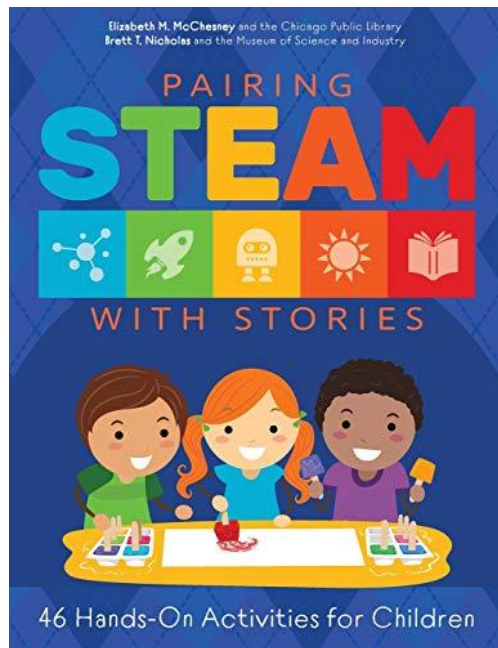
[View in Catalog](#)

State Library of Iowa STEM To Go kits

<https://www.statelibraryofiowa.gov/index.php/libraries/toolkits-guides/stem-go-storytime-kits>



State Library's Library Science Collection





IOWA STATE UNIVERSITY

Extension and Outreach

STEM Lit to Go!

STEM-Lit to Go! is a new and innovative Iowa 4-H Clover Kids curriculum that supports the development of STEM and literacy skills for children in kindergarten through third grade. Each lesson includes engaging fiction and non-fiction picture books to build excitement and illustrate STEM concepts. Children explore key STEM concepts such as the engineering design process, conducting investigations, graphing, physics and much more! Each lesson provides children with a hands-on STEM experience and multiple opportunities to read, write, speak and listen about that experience.

Intended Audiences:

Early Elementary Youth

Contact Name

Nicole Hanson

nhanson@iastate.edu

(515) 294-1611

[More About This Program](#)

**But what if you
want to start
tomorrow?**



No Prep STEM Toolkit (STEAM Powered Family)

- Craft sticks
- Wooden chopsticks
- Wood clothespins
- Rubber bands
- Pipe cleaners
- Cotton balls
- Index cards
- Paper
- Coffee filters
- Binder clips
- Straws
- Yarn or string
- Cotton swabs
- Clear plastic cups
- Plastic spoons
- Beads
- Marbles
- Balloons
- Recycled cardboard, boxes, tubes, etc.



STEM Supply List (Little Bins for Little Hands)

- LEGO bricks
- Wooden tinker toys
- Dominos
- Cups (paper, plastic, styrofoam)
- Paper plates
- Paper tubes and rolls
- Paper (printer and construction)
- Markers and colored pencils
- Dry-erase board and markers
- Scissors
- Tape and glue
- Paper clips, binder clips, etc.
- Pool noodles
- Craft sticks (jumbo and regular)
- Cupcake liners
- Coffee filters
- Straws
- Rubber bands
- Marbles
- Magnets
- Toothpicks
- Egg cartons
- Aluminum cans
- Aluminum foil
- Clothespins
- Packaging materials
- Recyclables
- Seasonal/thematic items





<https://littlebinsforlittlehands.com>



<https://thestemlaboratory.com>



www.steampoweredfamily.com



www.littlepassports.com/blog



STAR★*net*

www.starnetlibraries.org

STEM **ACTIVITY**
Clearinghouse

Curated STEM Activities & Resources

Facebook groups

STEAM Library Ideas (private, must request membership)

STEM in Libraries (public, anyone can join)





OELWEIN PUBLIC LIBRARY



THEME THURSDAYS March

7 WATER!

Learn how various substances and objects interact with water.

11 LEGOS

We have Legos. You have an idea. Use our Legos to build your idea, then we'll display it in the library for a month.

21 CLAUDE MONET

Create your own artwork in the style of French painter Claude Monet.

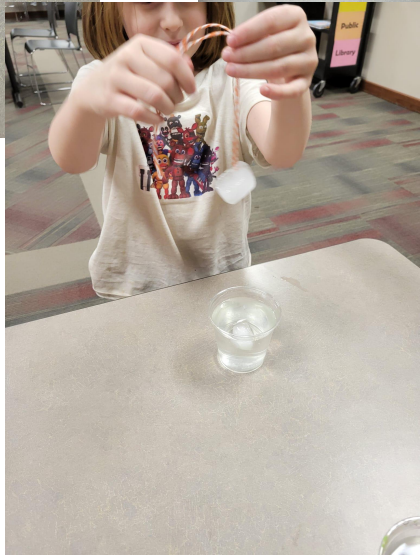
25 THE SCIENCE OF COLOR

Discover what's behind the colors we see with these simple experiments.

**THURSDAYS
@ 4PM**

For more information:
oelwein@oelwein.lib.ia.us
319-283-1515

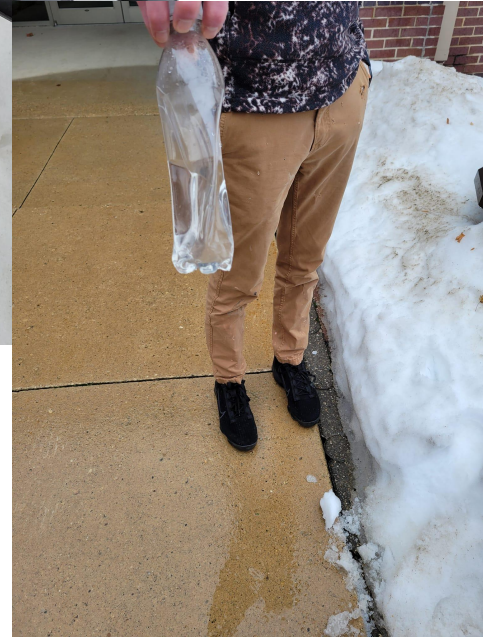




Ice cube on
a string

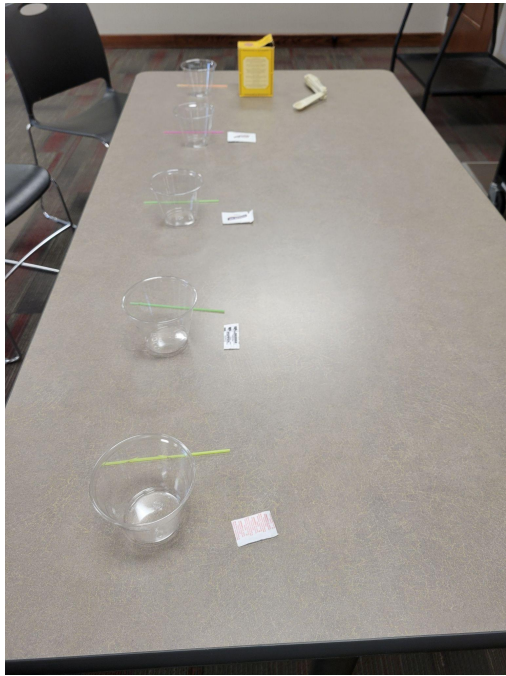
**LITTLE
PASSPORTS**
BY BEGiN





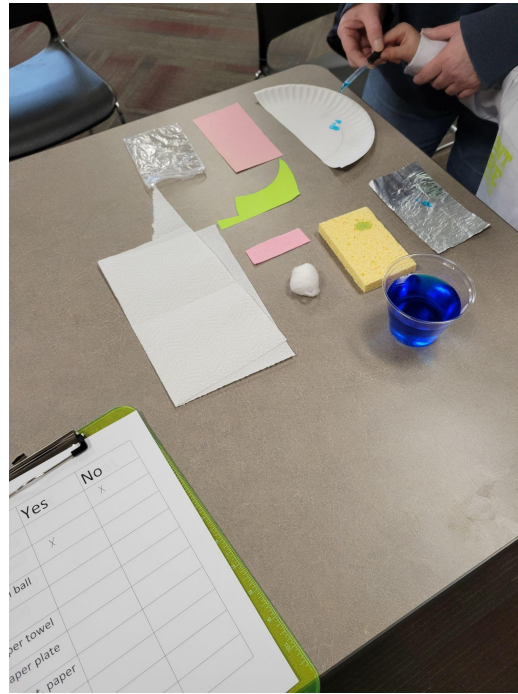
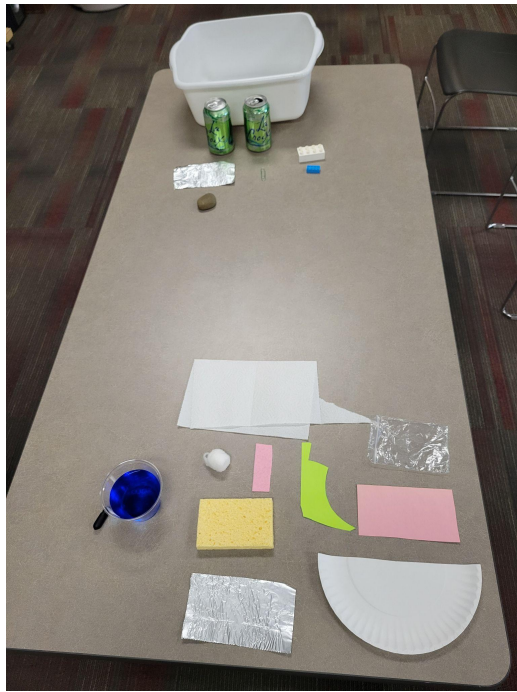
Bottle crush





What dissolves in water?

LITTLE BINS
FOR LITTLE HANDS



	Yes	No
ball	x	
paper towel		
paper plate		
paper		

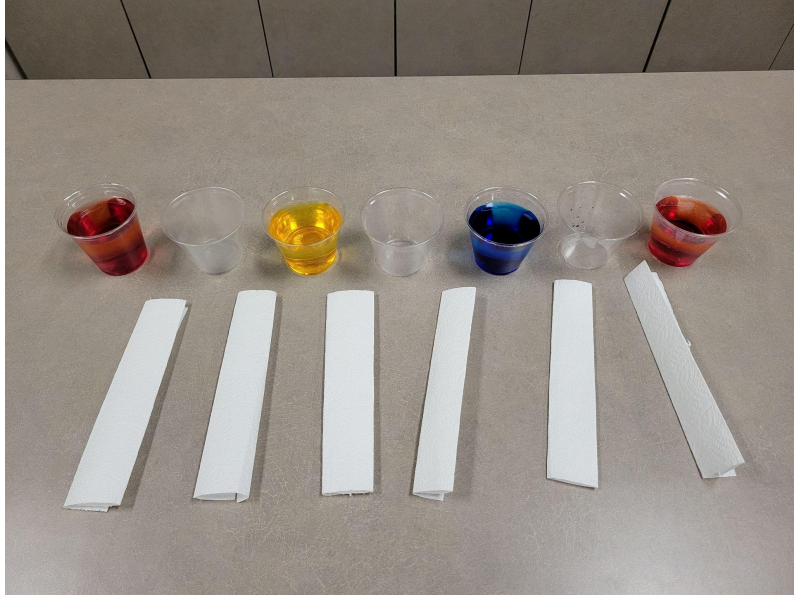
What absorbs water? What floats in water?





Baking soda &
vinegar fizz

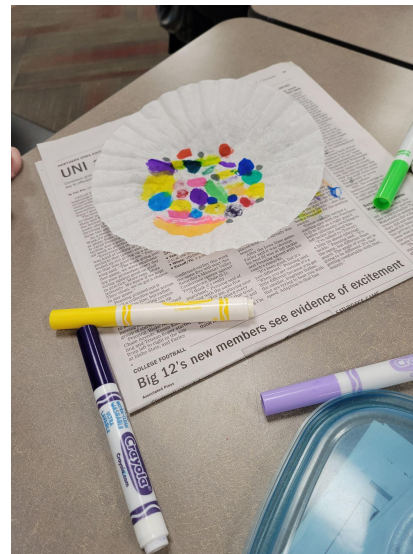
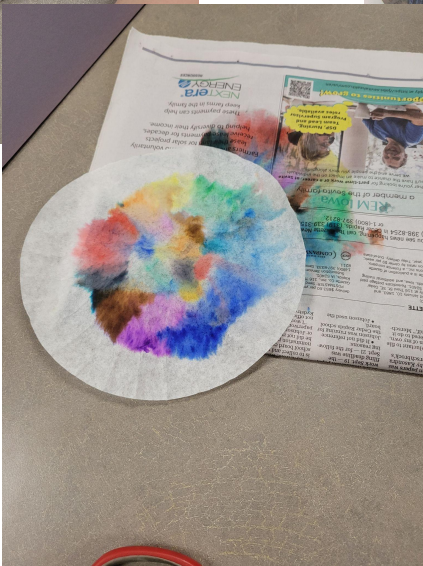
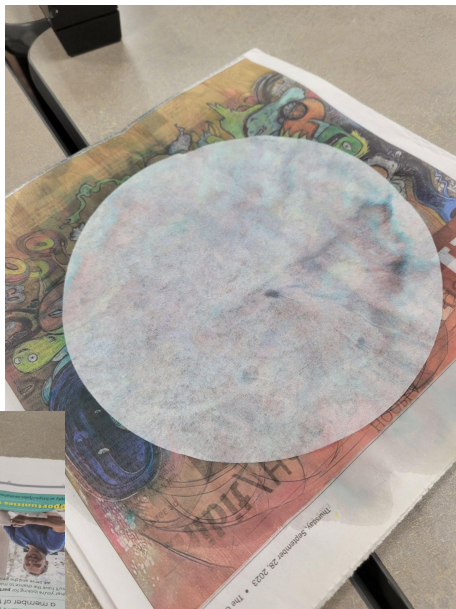
Bonus: <https://www.messylittlemonster.com/2024/03/baking-soda-and-vinegar-experiments.html>



Rainbow walking water (capillary action)

<https://funlearningforkids.com/rainbow-walking-water-science-experiment-kids/>





Coffee filter chromatography

<https://www.thebestideasforkids.com/coffee-filter-chromatography/>



DIY spectroscope

LITTLE BINS
FOR LITTLE HANDS



Okay, but...

I don't have dedicated programming space.

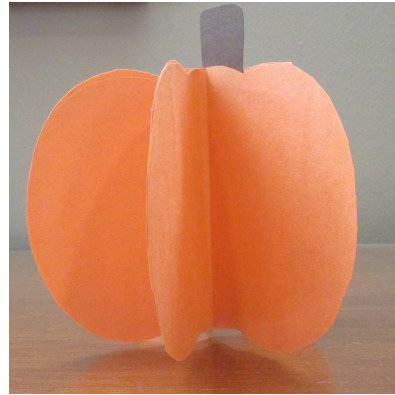
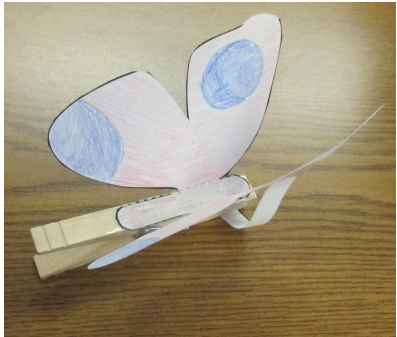
I don't have the staff for this.

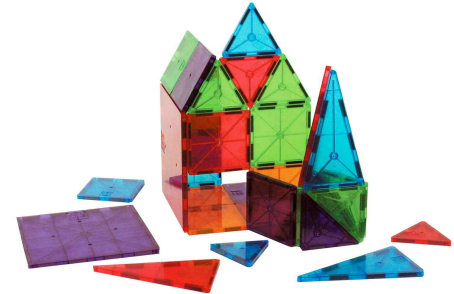
I don't have the time to add another program.

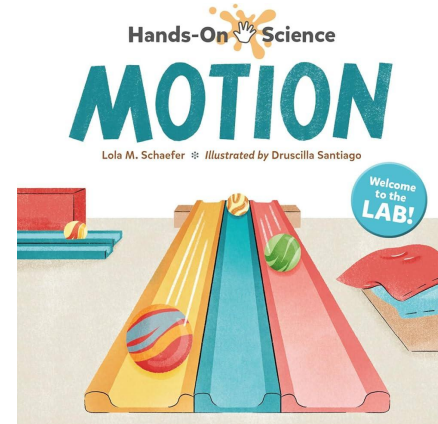
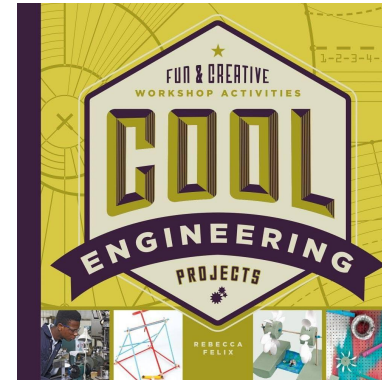
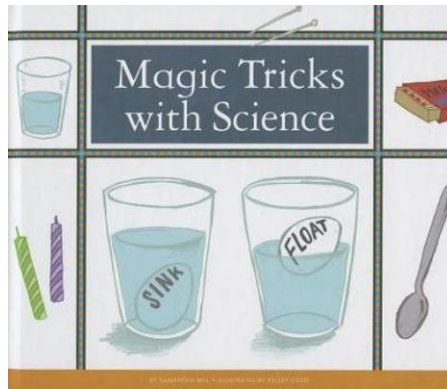
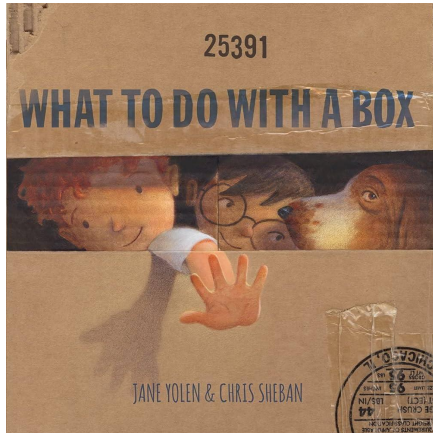
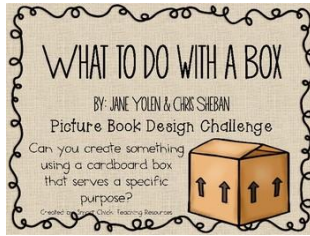
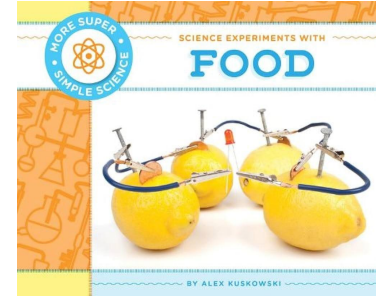
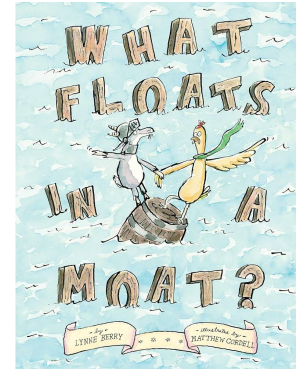
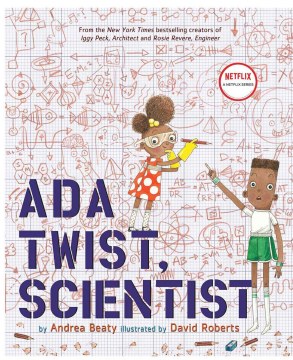
I don't know if my community would be interested in this.

I'm just still not sure about this.

Passive programs are the perfect solution!







Resources

National Survey of Science and Mathematics Education

<https://horizon-research.com/NSSME/2018-nssme>

“Focusing on Science with Elementary Students This Year”

<https://www.edutopia.org/article/focusing-science-elementary-students-year/>

“Why Do Elementary Students Need STEM? It’s not What You Think”

<https://yetiacademy.com/elementary-students-need-stem/>

Iowa Governor’s STEM Advisory Council

<https://iowastem.org>

STEM Scale-Up Program

<https://iowastem.org/Scale-Up>

State Library of Iowa STEM-to-go kits

<https://www.statelibraryofiowa.gov/index.php/libraries/toolkits-guides/stem-go-storytime-kits>

Starnet Libraries

<https://www.starnetlibraries.org>

ISU Extension STEM Lit to Go!

<https://www.extension.iastate.edu/programcatalog/stem-lit-go>

STEAM Powered Family

<https://www.steampoweredfamily.com/>

Little Bins for Little Hands

<https://littlebinsforlittlehands.com/>

The STEM Laboratory

<https://thestemlaboratory.com/>

Little Passports

<https://www.littlepassports.com/blog>



STEAM Library Ideas
STEM In Libraries





Thanks!

Do you have any questions?

kschuelke@oelwein.lib.ia.us
319-283-1515

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