Welcome!

Introduce yourself in the chat and share with us one of your earliest memories of play

NGCP

CONNECT + CREATE + COLLABORATE

Supporting Early Childhood STEAM Experiences through Play

June 9, 2025

NGCP Vision

The vision of the National Girls Collaborative Project is to **support and create STEM experiences that are as diverse as the world we live in**.

NGCP Resources

- **National Webinars**
  - Offered regularly on relevant topics, speakers include educators, researchers, authors, and diverse STEM professionals
- **Monthly Newsletter**
  - National events, STEM resources for girls and youth, professional development opportunities for educators, and research and reports
- **NGCP Website**
  - Exemplary Practices pages on Engaging Girls in STEM and Access and Equity, blog posts, and statistics and research related to girls and women in STEM

NGCP Podcast: Inspiring Curiosity from Early Childhood to Break Gender Stereotypes

In our first episode, we explore the crucial role of early childhood experiences in shaping girls' interest and engagement in STEM

5 Ways to Be an Ally to Girls and Women in STEM

If you think of gender equity in STEM as a “women’s issue” we encourage you to think again!

Speakers

Authors of Playful STEAM Learning in the Early Years: An Educator's Guide to Screen-Free Explorations

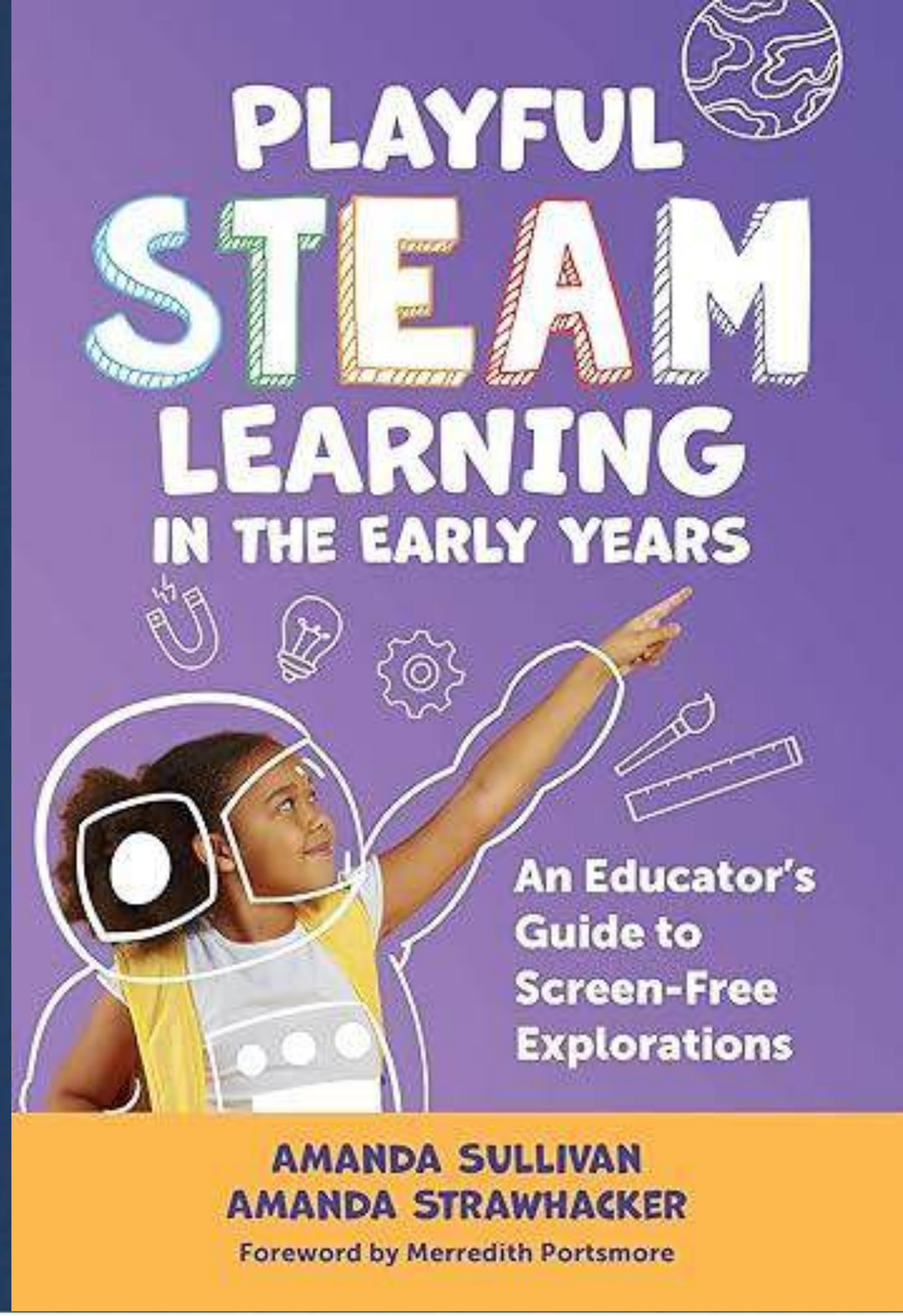
Dr. Amanda Strawhacker
Schechter Boston

Dr. Amanda Sullivan
National Girls Collaborative Project

Special Thanks

- Sarah Jubar and everyone at Teachers College Press
- Merredith Portsmore, Center for Engineering Education Outreach at Tufts University
- Marina Umaschi Bers, The DevTech Research Group at Boston College
- A huge thank you to NGCP for hosting us today!

Teachers College Press
Teachers College, Columbia University



Slido Poll

Join at

slido.com

#1692 407

"The drive to play is so intense that children will do so when they have no real toys, when parents do not actively encourage the behavior, and even in the middle of a war zone" - Dr. Rachel E. White

The Power of Play

- Play is critical for children's early cognitive development and learning (Hirsh-Pasek et al., 2009; Pellegrini, 2009; Scarlett et al., 2004)

- Play leads to improved academic and social outcomes by allowing children to build strategies and dispositions for lifelong learning (Hirsch-Pasek et al., 2009)

The Power of STEAM

Why the "A" of the arts matter!

- STEAM = Integrating interpretive, expressive, and humanistic perspectives to STEM activities
- STEAM offers the flexibility and open-endedness inherent in arts pedagogies (Robelen, 2011)
- Early childhood educators are often insecure about their own STEM skills, but have more confidence and comfort with arts integration (Bresler, 2007; Dong & Xu, 2020; Hartman & Dani, 2020; Masoumi, 2020).

STEAM Play = life skills we need as adults!

credit: @bupc_boopsy on Instagram

Reaching Girls with Playful STEAM

Why early childhood matters!

- Stereotypes about girls' interest in computer science and engineering are formed as early as age 6 and are evident across multiple ages from childhood through adolescence (Master, Meltzoff, & Cheryan, 2021; Sullivan, 2019).

- Parents still more frequently encourage sons to do STEM activities, including using STEM-themed toys, than daughters. (Geena Davis Institute on Gender in Media, 2021).

Encouraging girls' positive early exposure to STEAM is an important way to counter stereotypes about these fields and build girls' confidence, curiosity, and interest!

Play Observations

Let’s observe some examples of children’s everyday play through a STEAM lens!

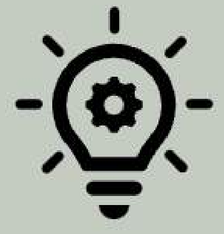
Instructions:

- Look at each image
- Share in the chat:
  - What STEAM-related question might this child (or these children) be exploring or asking through their play?
  - How might educators/caregivers encourage further play-based exploration of what they are curious about?

The Playful STEAM Learning Framework (PSLF)

Curiosity-Based Play

Supports children's questions and helps develop their intellectual curiosity.

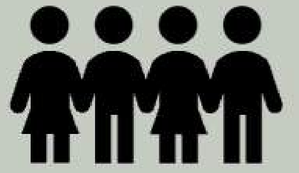


Authentic Play

Supports children in playful learning that is personally and culturally meaningful to them.

Child-Led Play

Empowers children to take the lead in their playful learning experiences.



Four Pillars of the PSLF

P - Persevering through hard fun

L- Listening to children's ideas

A - Actively supporting inclusion

Y - Saying Yes to open-ended sensory play

Persevering Through “Hard Fun”

Put it in practice:

Support children through frustration so they can make a discovery about something they are curious about.

Foster a culture of learning from mistakes.

Listening to Children's Ideas

Put it in practice:

Value curiosity by tracking children's questions and providing opportunities to answer questions and test ideas.

Take children's suggestions for STEAM projects, centers, and explorations.

Provide opportunities for Project Based Learning (PBL) to explore authentic projects that children are invested in.

Actively Supporting Inclusion

Put it in practice:

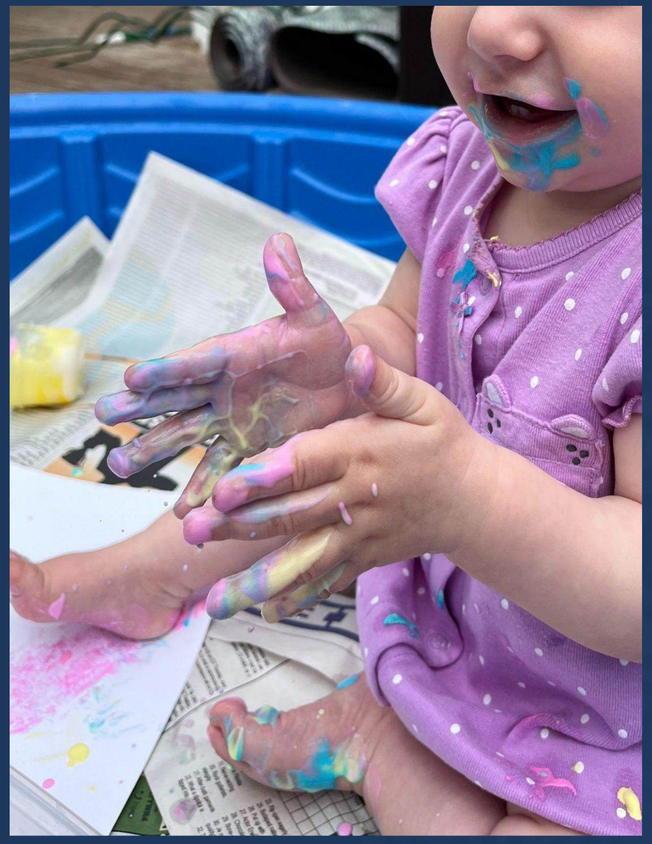
Ensure children have a voice and choice.

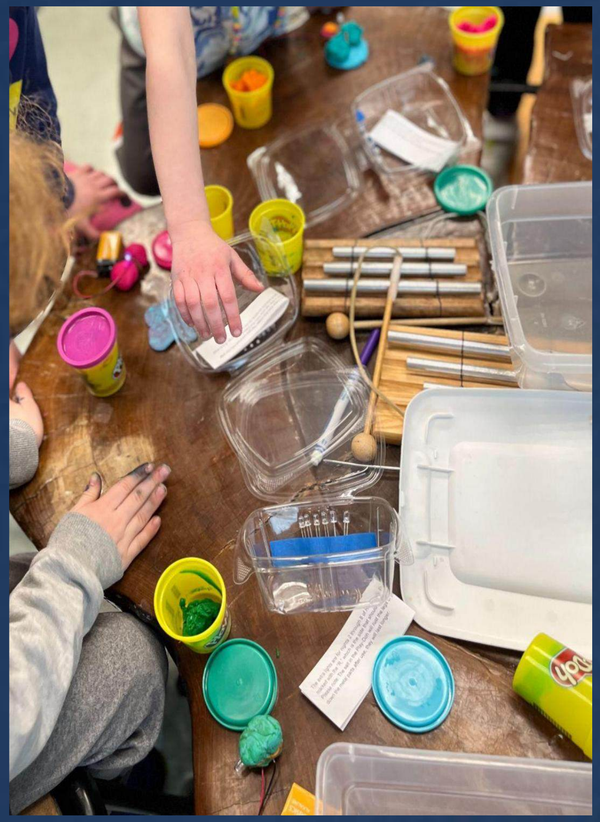
Make STEM play interesting to a wider range of children by incorporating the arts, music, social studies, etc. (i.e., a STEAM approach).

Explore personally and culturally relevant STEAM content.

Meet children's individual needs by providing different ways to engage with STEAM play.

Saying “Yes!” To Open-Ended Sensory Play





Put it in practice:

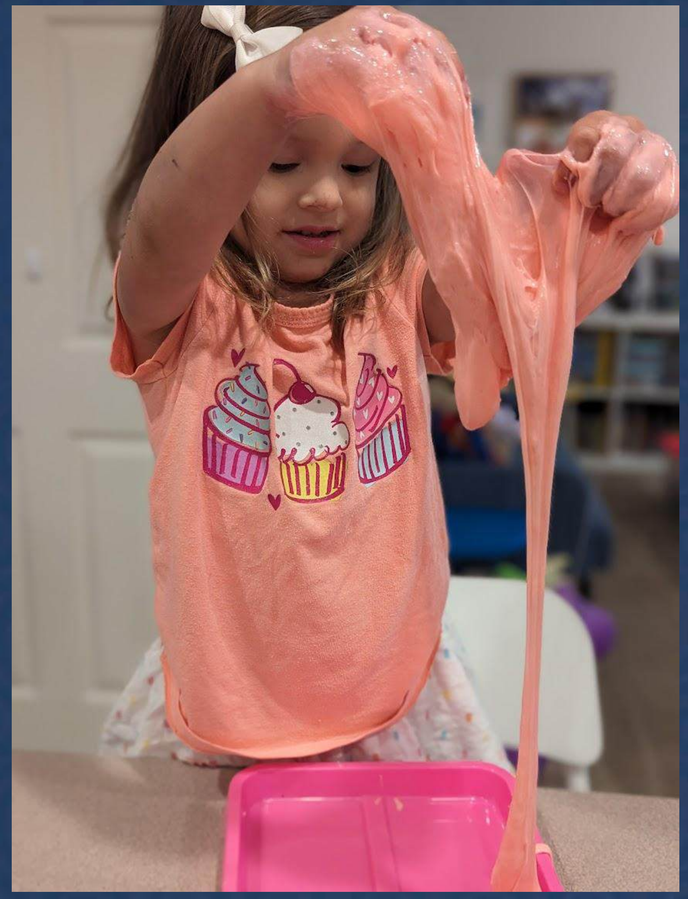
Provide sensory materials for exploration that children are curious about, even if it may not have a specific “learning goal” from the start.

Provide children with choices for messy and hands-on STEAM exploration.

Provide a mix of materials that are personally and culturally relevant to children.

Try This:

Screenshot this simple slime recipe for sensory fun!



3-Ingredient Slime Recipe

- **GLUE:** 2 (4-ounce) bottles washable school glue
- **BAKING SODA:** 1 teaspoon baking soda
- **SALINE SOLUTION:** 2 to 3 tablespoons saline solution (e.g., contact lens solution)

Optional ingredients:

- 1 to 2 drops liquid food coloring
- 1/4 cup glitter

Playful STEAM Can Happen Everywhere!

Resources & Activities

Low-Cost Materials

- **Recycled / Found Materials**
  - Cardboard, egg cartons, yogurt containers
  - Natural materials (e.g., pinecones, sticks, leaves, water)

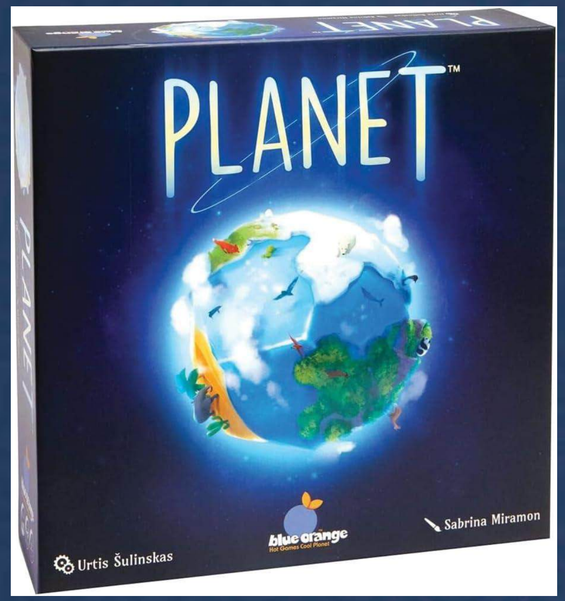
- **Arts and Craft Materials**
  - paint, food dye, markers, tissue / construction paper
  - popsicle sticks, playdoh, wikki stix, pipe cleaners

- **Low-cost screen-free programmable robots**
  - Code n Go Robot Mouse ($30)
  - Learning Resources Botley Robot ($45)

- **Other Materials**
  - Blocks, LEGO, magnetic tiles, etc.

Board Games

Board Game	Content Connections	Age
Robot Turtles	Coding	4+
Suspend Junior	Engineering, Physics	4+
Math Tac Toe	Math	8+
Planet	Environmental Science	8+
Code Master Programming Logic Game	Coding	8+



Picture Books

a few girl-powered ideas to get you started!

Boxitects by Kim Smith

Ada Twist, Scientist by Andrea Beaty

Rosie Revere, Engineer by Andrea Beaty

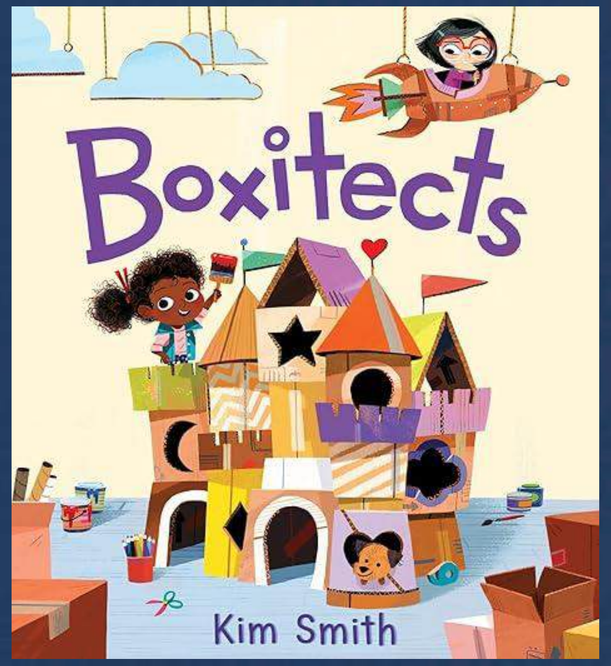
Mazie's Amazing Machines by Sheryl Haft

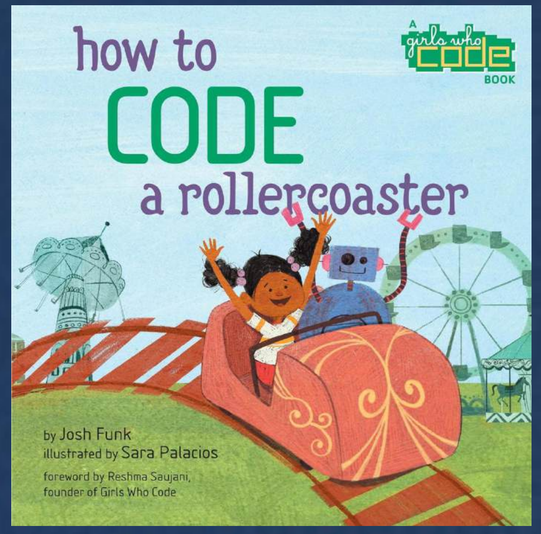
The Most Magnificent Thing by Ashley Spires

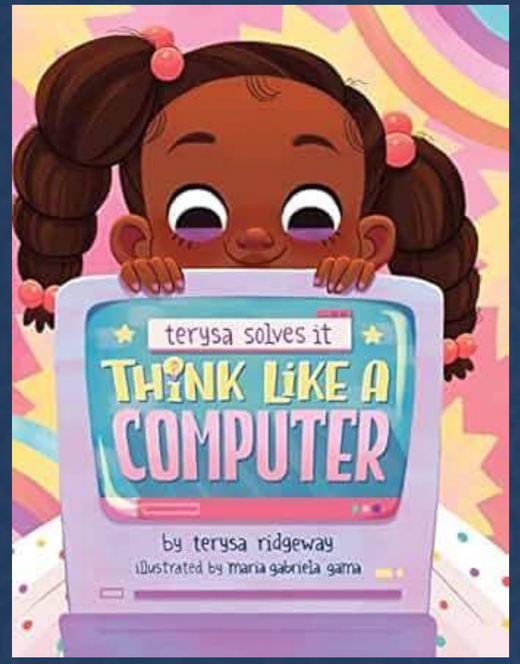
Terysa Solves It: Think Like a Computer by Terysa Ridgeway

How to Explain Coding to a Grown Up by Ruth Spiro

How to Code a Rollercoaster by Josh Funk







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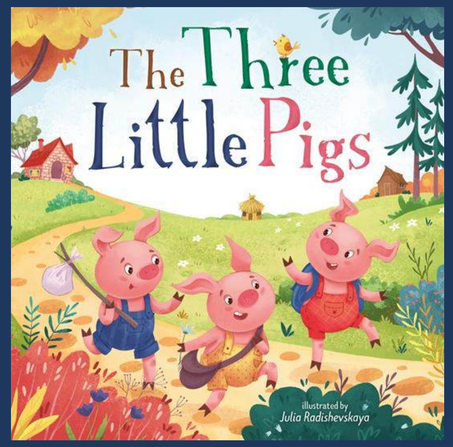
The Three Little Pigs
illustrated by Julia Radishevskaya

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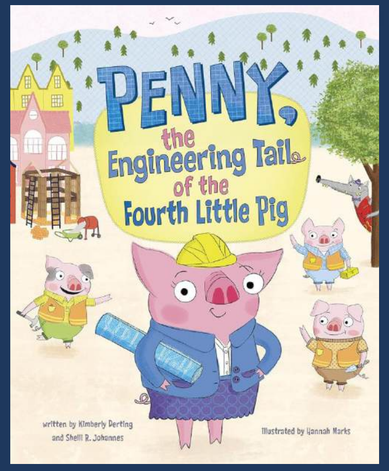
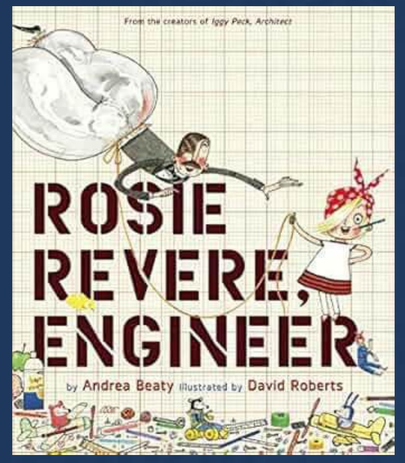

PENNY, the Engineering Tail of the Fourth Little Pig
written by Kimberly Derting and Shelli R. Johannes
Illustrated by Hannah Marks


From the creators of Iggy Peck, Architect
ROSIE REVERE, ENGINEER
by Andrea Beaty illustrated by David Roberts


Honeywell

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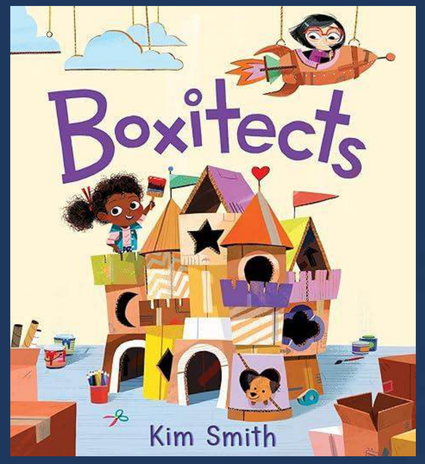
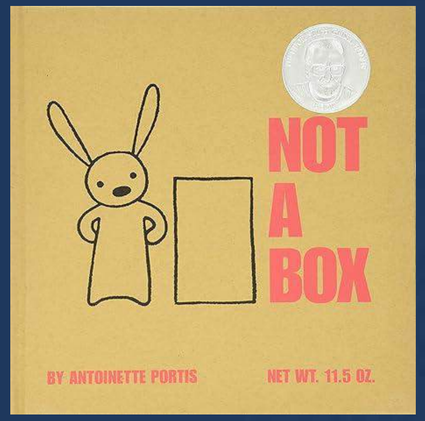
Try This!


Boxitects
Kim Smith


NOT A BOX
BY ANTOINETTE PORTIS
NET WT. 11.5 OZ.

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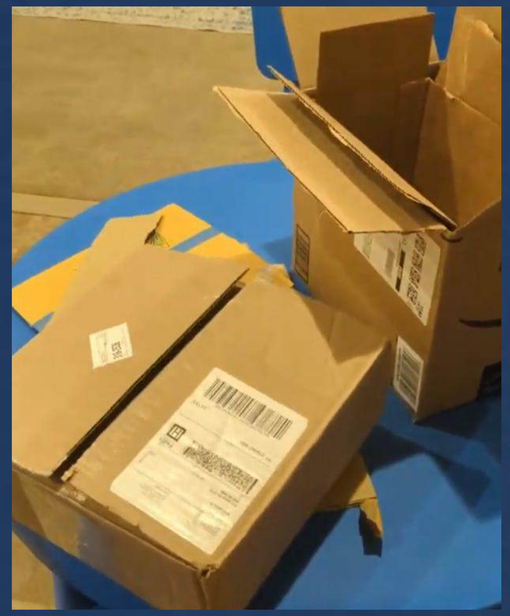

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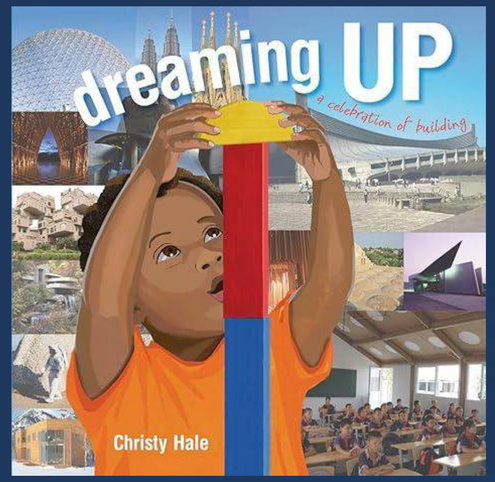
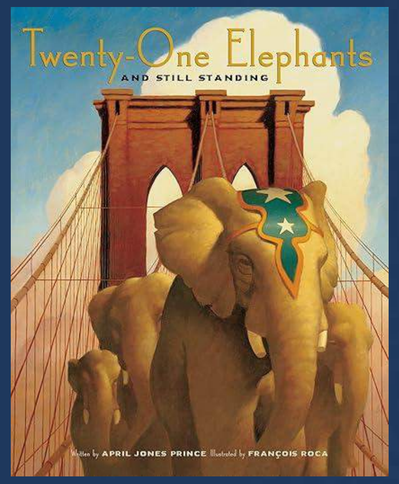
ingenuity

Try This!


dreaming UP
A celebration of building
Christy Hale


Twenty-One Elephants
AND STILL STANDING
Written by APRIL JONES PRINCE Illustrated by FRANÇOIS ROCA

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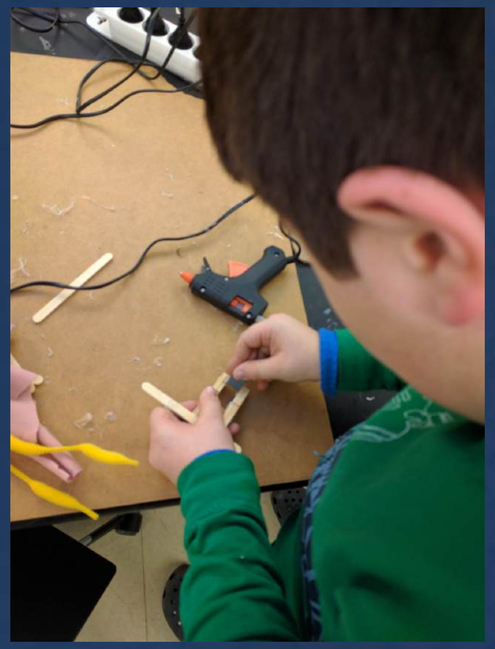

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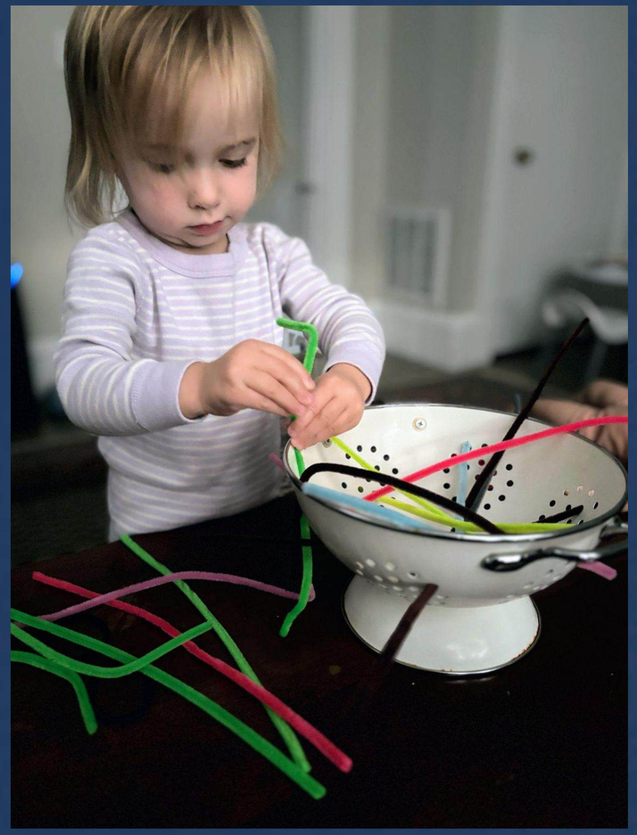
Need More Ideas?

Follow @PlayfulSTEAM on Instagram for playful activity ideas and resources!

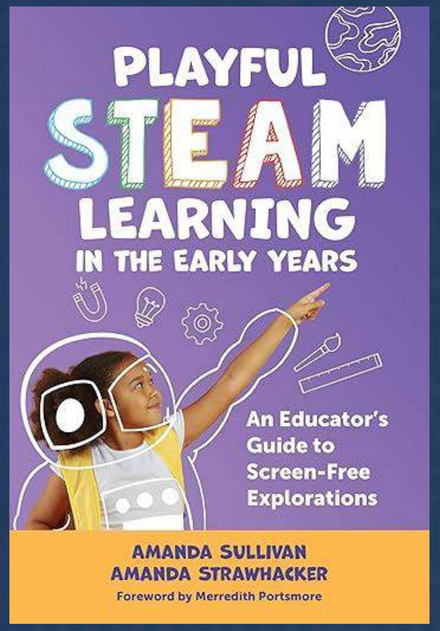


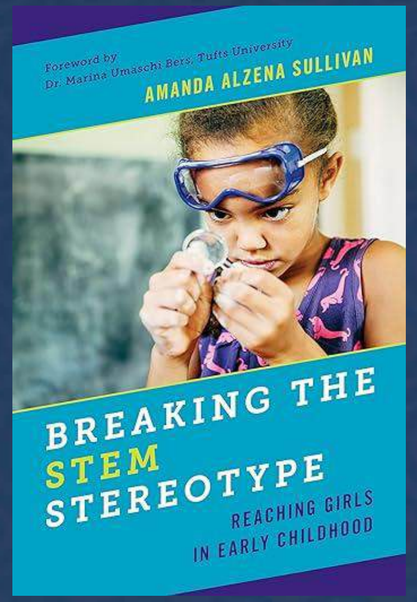
More Resources

- **Books:**
  - *Playful STEAM Learning in the Early Years* by Amanda Sullivan & Amanda Strawhacker
  - *Coding as a Playground* by Marina Umaschi Bers
  - *Breaking the STEM Stereotype* by Amanda Sullivan
  - *The Importance of Being Little* by Erika Christakis

- **NGCP Resources:**
  - Choosing Toys to Break STEM Stereotypes
  - Picture Books to Break Stereotypes in STEM (and Beyond!)
  - Genius of Play & NGCP's STEAM Playbook

- **Websites:**
  - CS Unplugged
  - Coding as Another Language





Order Your Copy of Playful STEAM Learning in the Early Years Today!

Use code PLAYFUL15 for 15% off ordering from Teachers College Press!

"An essential guide for parents, educators, and caregivers."

Julie Dobrow
Tufts University

"A wonderful book for everyone who cares about the future: our children!"

Marina Umaschi Bers
Boston College

"An indispensable guide for fostering playful, screen-free STEAM learning."

Christine M. Cunningham
Museum of Science, Boston

Keep in Touch!

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The Amandas Together: theamandasconsulting@gmail.com

@PlayfulSTEAM on Instagram

Enter to win a copy of Playful STEAM here!

Q & A

We’ll take questions from the chat and from people using the ‘hand raise’ function.

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Learn more at **ngcproject.org**

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