

CAEMI Breakout:

Boats that Float!



The California Statewide Early Math Initiative is funded by the California Department of Education, Early Learning and Care Division and the California State Board of Education.

Boats that Float!

- **MATERIALS NEEDED:**

- Materials from CoP #4 Bag:
 - Squares of tin foil
 - Marbles
- Medium size bowl, plastic bin or tub
- Water
- Additional materials: other small objects to try in your boat (ex. Coins, small plastic toys, etc.)



Where is the STEAM?

Science

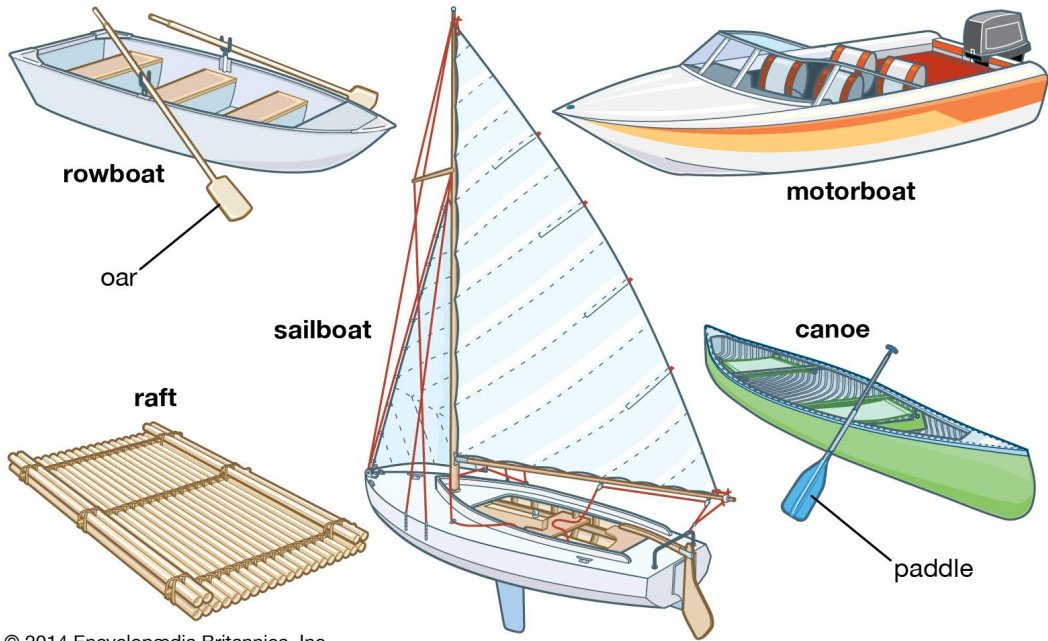
Technology

Engineering

Art

Math

TYPES OF BOAT



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DESIGNS BASED ON CARGO



DESIGNS BASED ON MATERIAL



A collection of colorful wooden blocks and shapes scattered on a light-colored surface. The blocks include various colors like red, blue, green, yellow, and orange, and shapes like cubes, cylinders, and rectangular prisms. Some blocks are stacked or arranged in small structures, while others are scattered around. The background is a plain, light-colored surface, possibly a table or floor.

1ST DESIGN CHALLENGE!
Design a boat that will float
and hold some marbles.



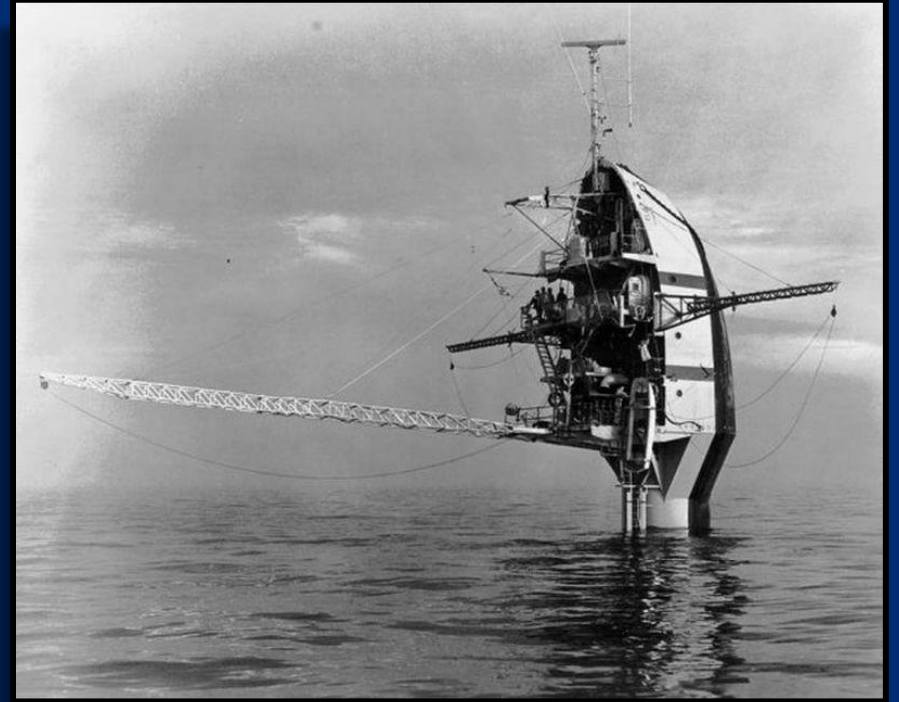
2ND DESIGN CHALLENGE!

Design a boat that will float
and hold more marbles than
your first boat.

REFLECTION

**What adjustments did
you make in your 2nd
design and why?**

UNIQUE BOATS



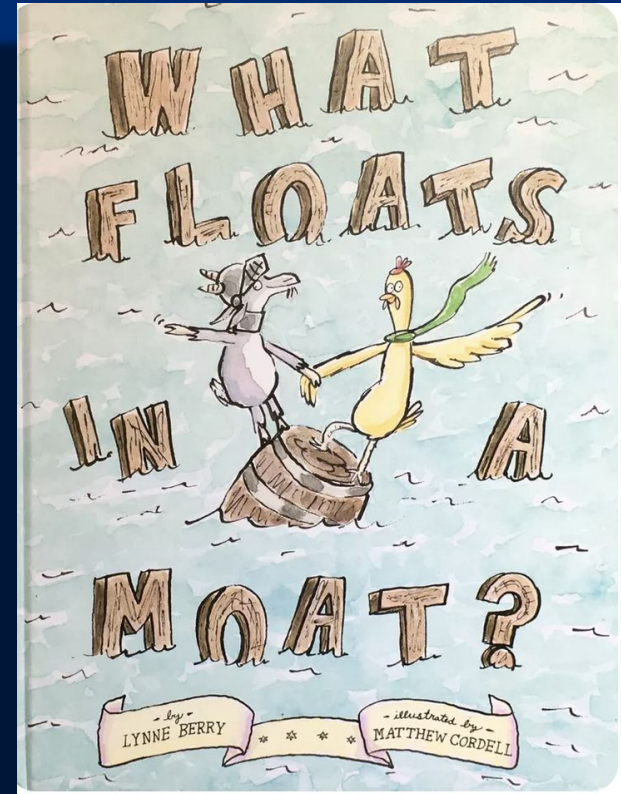
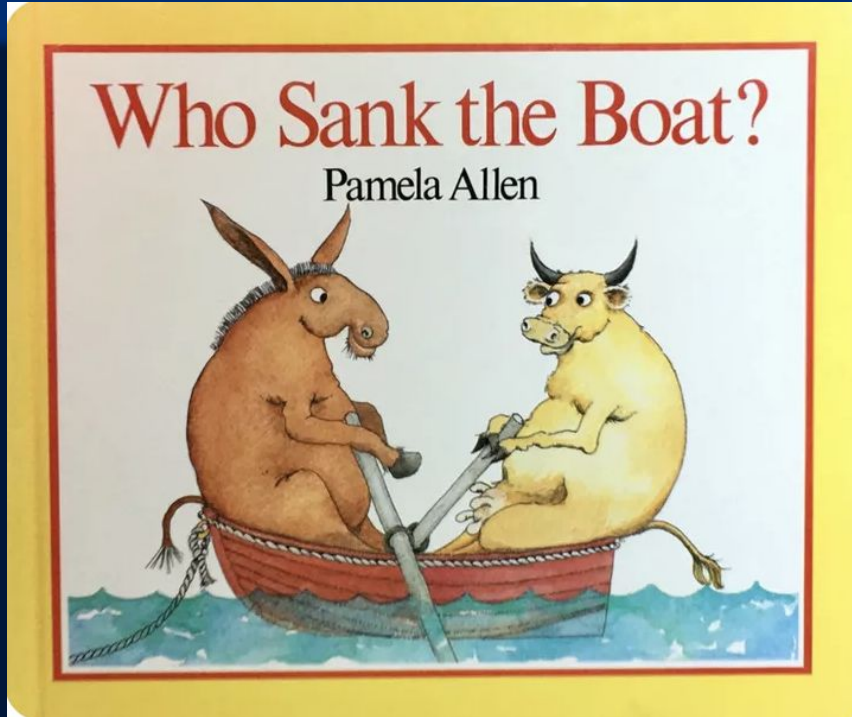
FLOATING INSTRUMENT PLATFORM (FLIP)



Research Platform FLIP



CHILDREN'S BOOKS



MORE BOATS!



3RD DESIGN CHALLENGE!

- Find 2 more items you want to test to see if they sink or float.
- Can you find another item you could use to build a boat?

Where is the **STEAM**?

Science

Technology

Engineering

Art

Math

ACTIVITY GUIDE



BOATS THAT FLOAT

GRADES K-3



MATERIALS

- Small squares of aluminum foil
- Ruler
- Plastic tub or bowl filled with water
- Small items such as crayons, pennies to test your boat's buoyancy



CREATE

Using the aluminum square design a boat that you think will still float when you add objects in it.



OBSERVE

Add one object at a time to your boat. What happens?



PLAY

Make a boat with a different design. Add the same objects or test buoyancy with different objects.

KEY CONCEPTS

- **Physical Science**
Explore buoyancy, density and gravity as they relate to floating.
- **Engineering**
Explore different design concepts as they build their boats.

QUESTIONS TO ASK

- What shapes are you using in your boat design?
- How can you design a boat that will hold the most objects?
- What would happen if you used a different material to build your boat?
- If your boat doesn't float, what changes can you make to your design that might help it float.

THINGS TO NOTICE

- Child's joy and excitement as they design and build their boat.
- Child's wonderment as they float their boat and as objects to it.
- How the child works with the materials.
- What are they curious about?

VIDEO RESOURCES

- [Video: Why do ships float?](#)
- [Video: Why do ships float?](#)
- [Archimedes Principle](#)

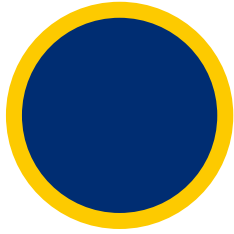
CHILDREN'S BOOKS

- [Who Sank the Boat? by Pamela Allen](#)
- [What Floats in a Moat? by Lynne Barry](#)

CAEMI 2020-21 Reflection

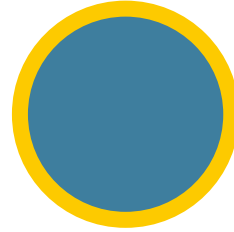


Flipgrid



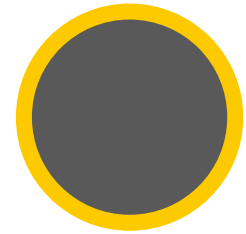
The CAEMI Work

How did what another group share relate to your CAEMI work?



INSPIRATION

How might you be inspired by other organizations' stories?



Connections

What videos connected with you?

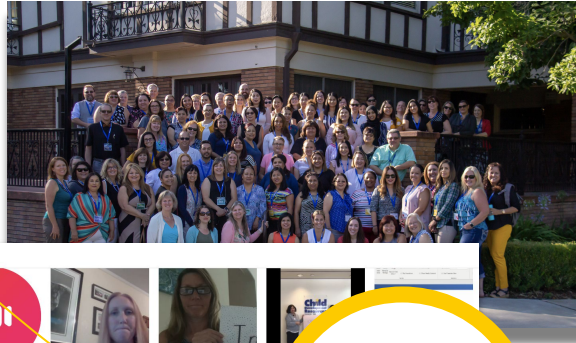
COMMUNITY OF PRACTICE LANDMARKS

How will this journey help you chart your path ahead?

CA Early Math Project - Children's Literature



BIG IDEAS
shared interest and key issues



RESOURCES
methods, stories, and tools

Math Take Home Kits

Audience

Activities

Material

CREATE

Allow children to help in creating three viewfinders. Talk about the variety of shapes that should be included. Demonstrate how to use the shape viewfinder.

PLAY

As children find shapes, talk to the child about sizes, places to look, and how to match the outline every opportunity to discuss color or wider than the different attributes.

MATERIALS

- Plastic wrap
- Cereal box
- Tape
- Scissors
- Permanent Marker

Country Reasoning

Reflection Questions:

- How did you use the shape viewfinder to solve the problem?
- How did you use the shape viewfinder to solve the problem?
- How did you use the shape viewfinder to solve the problem?

What's Next?

- How did you use the shape viewfinder to solve the problem?
- How did you use the shape viewfinder to solve the problem?
- How did you use the shape viewfinder to solve the problem?

COMMUNITY
relationships and learning

Record a Response

Sarah S. 10 mins ago

Kathy D. 8 mins ago

Angela P. May 13

Donyale M. May 13

4Cs
Sonoma State University

BANANAS

LEARNING THEMES

LEARNING THEORY

Math Identity and Mindsets
Play-based Learning

PROFESSIONAL NOTICING

HIGH-QUALITY PROFESSIONAL LEARNING

Connecting Foundations and Standards
Adults as Learners

CULTURALLY RELEVANT PEDAGOGY

CHILDREN'S MATH AND SCIENCE

Maker Faire/Tinkering
Spatial Reasoning
Number Sense
Coding

Early Math Initiative

The Development of Arithmetic Skills and Concepts from Infancy Through the Early School Years

Before children enter school, and even before they can talk or count, they show signs of early arithmetic abilities. Before they are even to measure things and compare in quantity. Toddlers realize when there is "more" or "less" of something and can answer their questions. As their cognitive and social skills mature in preschool, children develop an understanding of counting and numbers and begin to solve simple arithmetic problems by manipulating objects. This development provides a foundation for the later skills of addition and subtraction. From kindergarten through the early school years, children deepen their knowledge of addition and subtraction and learn to solve arithmetic problems more quickly and accurately.

Young children learn math best through experiences of play-based, everyday opportunities to use their knowledge, using manipulatives, becoming scientists.

In This Brief

- A summary of research findings on the development of arithmetic, skills and concepts from infancy through the early school years.
- Practical implications for educators and caregivers of young children from both through age eight.

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SECTION TITLE

Presentation Subtitle



Where's the STEAM?

REFLECTION

QUESTION



TOPIC 1

Description



TOPIC 1

Description



TOPIC 1

Description



TEXT

Subtext

“

FOOD FOR THOUGHT

Quote here

AUTHOR

”

REFLECTION

QUESTION

IDEA

Subtitle

Description





TOPIC 1

Description



TOPIC 1

Description



TOPIC 1

Description



DESCRIPTION OF VIDEO/PHOTO

UNIFYING IDEA

TOPIC 1

Description

TOPIC 2

Description

TOPIC 3

Description

THANK YOU!

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REFERENCES

Reference