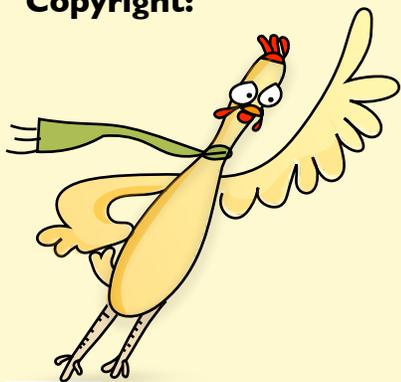
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ILLUSTRATOR:

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Archie and Skinny are on their way to see the Queen and must cross a moat to get to her castle. Archie, the goat, has grand plans to use a barrel of buttermilk to build a boat. Skinny, the chicken, is not convinced it will work.

Ages: 5 to 9 years**ATOS Level:** 3.1**Lexile:** 400L**ISBN:** 9781416997634**Copyright:**

What Floats in a Moat?

Will a goat and a barrel of buttermilk float in a moat?

What is STEAM? Learning through Science, Technology, Engineering, the Arts, and Mathematics. Through STEAM, children problem solve, innovate, create, and collaborate.

STEAM Topics in this Book: engineering, construction, perseverance, growth mindset, tinkering

Activities To Do Together: Let *What Floats in a Moat?* inspire your own floating investigations. Encourage your child to explore what will float and sink and then design, build, and test some boats of their own.

Before you read the book with your child:

- Ask your child to tell you what they know about moats. If your child does not know what the word moat means, explain that a moat is a deep ditch that is filled with water. A moat can be dug around a building to make it more difficult to approach.

While reading the book with your child:

- Notice that the second and third boats are filled with different amounts of buttermilk. Talk about how the second boat with a full barrel and the third boat with a partially full barrel reacted in the water. Why did they react differently?

When you have finished reading the story:

- Together, collect an assortment of objects that can be put into a bowl of water. Encourage your child to predict which objects will float and which objects will sink.
- Encourage your child to find an object that does not float and design a way to make it float.
- Give your child a piece of modeling clay. Encourage them to explore how the clay's shape influences whether it will sink or float. After they have figured out how they can change the clay to make it float, ask them to teach you what they found out.
- Give your child a sheet of tinfoil and some pennies. Ask them to try to design a boat with the tinfoil that will stay afloat while holding ten pennies, twenty pennies, etc. Encourage them to try different designs and modify their designs until they are successful.



Questions for STEAM Thinking:

1. Why didn't the goat want to use the drawbridge? How would the story have been different if the goat had used the drawbridge?
2. Why do you think the first boat, the S.S. Buttermilk, sank?
3. Why do you think the second boat, the S.S. Empty, floated? Why wasn't the design successful?
4. What was different about the S.S. Ballast that made it float AND sink? Why do you think so?
5. What do you think would be important for someone to know before they built a boat?

Early Math Project Resources:

Visit [What Floats in a Moat? Activities](http://www.earlymathca.org/what-floats-in-a-moat) (www.earlymathca.org/what-floats-in-a-moat)



Vocabulary

STEAM words found in the story: ballast, mapped, measured

Related STEAM words: engineering, persistence

Words to build reading comprehension:

buttermilk, contraption, drawbridge, moat

Related Books: *Rosie Revere, Engineer* by Andrea Beaty; *If I Built a Car* by Chris Van Dusen

Click this link to the [World Catalog](http://WorldCatalog) or enter bit.ly/3RAtnnC in your browser, to find *What Floats in a Moat?* in the public library.

Age Level	Related Foundations and Standards: California Common Core State Standards Mathematics Next Generation Science Standards (NGSS)
Kindergarten	Standards for Mathematical Practice 1: Make sense of problems and persevere in solving them. NGSS Science and Engineering Practices: Asking questions and defining problems; Planning and carrying out investigations NGSS Engineering Design: K-2-ETS1-1; K-2-ETS1-3
Grade 1	Standards for Mathematical Practice 1: Make sense of problems and persevere in solving them. NGSS Science and Engineering Practices: Asking questions and defining problems; Planning and carrying out investigations NGSS Engineering Design: K-2-ETS1-1; K-2-ETS1-3
Grade 2	Standards for Mathematical Practice 1: Make sense of problems and persevere in solving them. NGSS Performance Expectations: Physical Science 2-PS1-1; 2-PS1-2 NGSS Science and Engineering Practices: Asking questions and defining problems; Planning and carrying out investigations NGSS Engineering Design: K-2-ETS1-1; K-2-ETS1-3
Grade 3	Standards for Mathematical Practice 1: Make sense of problems and persevere in solving them. NGSS Performance Expectations: Physical Science 3-PS2-1; 3-PS2-2 NGSS Science and Engineering Practices: Asking questions and defining problems; Planning and carrying out investigations NGSS Engineering Design: 3-5-ETS1-3