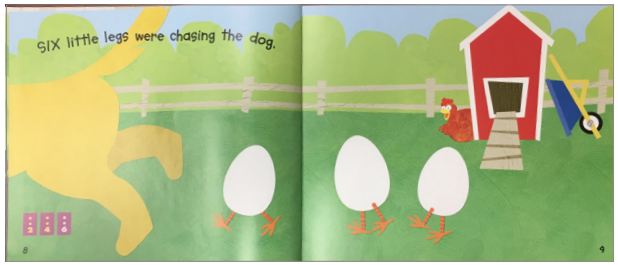
Eggs and Legs: Counting by Twos

by Michael Dahl and Todd Ouren

AGE LEVEL 3 –8 YEARS

About the Story

Mrs. Hen's eggs are missing! She counts two little legs under an egg running in the barn and then four little legs hiding in the corn. Are there more? Six legs are chasing the dog, and eight legs are climbing on the cow. Mrs. Hen keeps counting until she finds all 10 eggs with their 20 little legs. This book helps children count by twos by showing the numbers and corresponding dots on each page.



Words to Learn

NUMBER WORDS AND SYMBOLS

two, four, six, eight, ten, twelve, fourteen, sixteen, eighteen, twenty; 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

OTHER MATH WORDS

empty, little, into, through

About the Math

This story is about skip counting by twos. While counting along with Mrs. Hen, children can learn:

- How to count by twos.
- How to add two to another number. When we have eight legs and count two more, we are adding two to eight to get 10.
- Number relations. The number of eggs is related to the number of legs: One egg has two legs, two eggs have four legs, three eggs have six legs, and so on.

Math Talk During Reading

PRACTICE COUNTING BY TWOS

"Let's try reading the numbers in the corner of the page together: two, four, six, eight, 10, 12…"

PREDICT WHAT WILL HAPPEN WHEN YOU ADD TWO MORE

"I see 12 little legs on this page. If there are two more legs on the next page, how many legs will there be?"

EXAMINE THE RELATIONSHIP BETWEEN THE NUMBERS OF EGGS AND LEGS

"First there is one egg and two legs, and then we have two eggs and four legs. How many legs will there be when we have three eggs?"

Try to come up with some of your own questions and comments, too!

Activity After Reading

SCAVENGER HUNT

Go on a scavenger hunt around your home to find things that come in pairs, such as pants with two legs, pots with two handles, or windows with two panes. Practice counting by twos: "Let's count by twos to find out how many windowpanes we see! Two, four, six, eight..."

Guide by Colleen Uscianowski & Maya Goertemoeller

Sheep Won't Sleep: Counting by 2s, 5s, and 10s by Judy Cox and Nina Cuneo AGE LEVEL 5–8 YEARS

About the Story

Clarissa couldn't fall asleep, so she counted sheep, one by one. Still no sleep and she ended up with 10 naughty sheep in her room. What about counting pairs of alpacas, 2, 4, 6 … to 20? That didn't work either; 20 alpacas crowded in, too. She counted groups of 5 llamas up to 20, and groups of 10 yaks up to 50. Again, no sleep and now 100 stinky animals were messing up her room. How can Clarissa get rid of all these animals so she can sleep?

Words to Learn

MATH WORDS

pair, group, add, subtract, patterned, numbers from 0 to 100

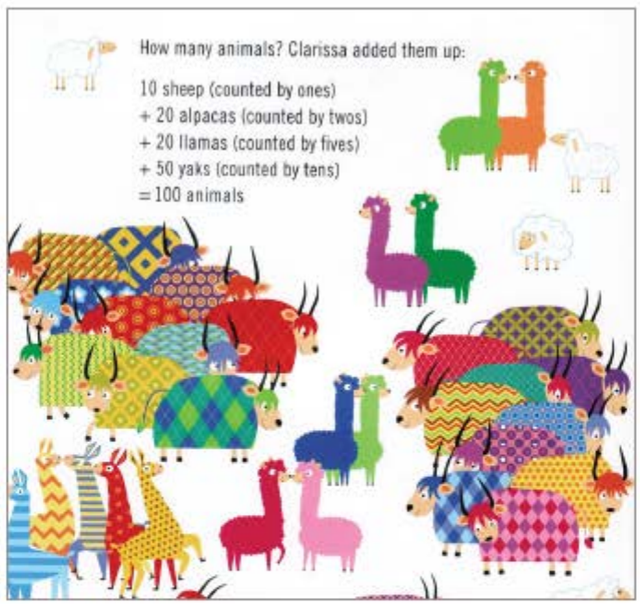
OTHER WORDS

stile (the author uses this to mean a fence), perfect grace, ewe, alpacas, lime green, magenta, llama, yak, argyle, cable, Fair Isles, wardrobe, afghan

About the Math

Reading this book, your child can learn:

- To count by 1s from 1 to 10.
- To count by 2s to 20: 2, 4, 6, 8…
- To count by 5s to 20: 5, 10, 15, 20.
- To count by 10s to 50: 10, 20, 30, 40, 50.
- To add these numbers (10 + 20 + 20 + 50) to get 100.
- To subtract these numbers to get to 0.



Math Talk During Reading

CHECK THE NUMBER OF OBJECTS IN DIFFERENT PLACES

"How many sheep are on the floor? How many yaks are near the fence?"

COUNT OUT LOUD

"Can you count by 2s? By 5s? By 10s?"

EXPLAIN ADDITION

"Why did Clarissa write 10 and then +20 +20 +50 = 100? What do those symbols mean?"

EXPLORE PATTERNS

"What are the patterns on the llamas?"

Try to come up with some of your own questions and comments, too!

Activity After Reading

PRACTICE COUNTING AND ADDING

Ask your child to count out loud from 1 to 10 and then find 10 little objects, such as raisins, to count. Now, count out loud by 2s to 10, and get 10 more objects. Then, have your child count out loud by 5s to 20 and get 20 more objects. Write 10, 10, and 20. Draw plus signs in between the numbers and have your child figure out the total. Their method may surprise you.

Guide by Herbert P. Ginsburg

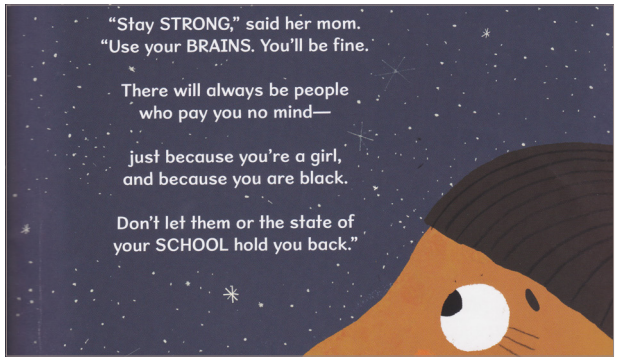
The Girl With a Mind for Math

by Julia Finley Mosca and Daniel Rieley

AGE LEVEL 6–8 YEARS

About the Story

In the 1950s, Raye Montague, a young Black girl, dreamed of becoming an engineer who built submarines. Yet at that time, many adults (wrongly) thought that girls could not become engineers. Also, her Arkansas schools were segregated and Black children's education was of poor quality. Raye's mom encouraged her to let nothing hold her back. Raye did just that. She overcame obstacles in college, where she was not allowed to study engineering, and in the workplace, where her talents were disparaged. Eventually, she designed the first ship by computer!



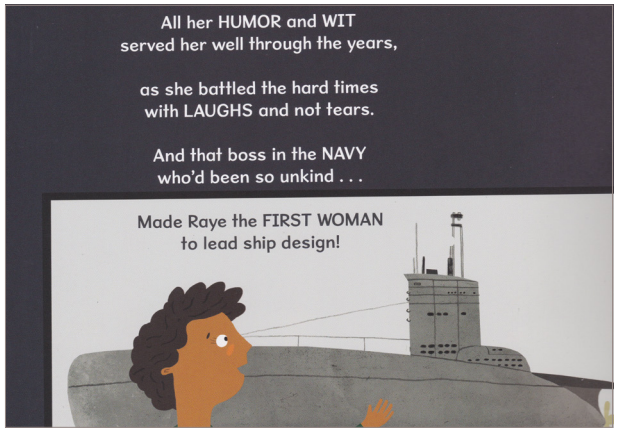
Words to Learn

engineer, headstrong, potential, segregated, grit, blueprints, abhorrible, deplorable, applauded, propel

About the Math

As children read the Raye Montague story, they can learn that:

- Engineers use complex math to build boats, submarines, and much more.
- Computer programs can speed up the process.
- Raye Montague's family helped her believe that she had potential and that she should not let discrimination she faced from being a Black girl deter her.
- Raye worked hard, with determination, and refused to let people stand in the way of her remarkable achievements as an engineer.



Math Talk During Reading

Ask your child to think about what Raye might have enjoyed about math/engineering that made her eager to do it despite its difficulty.

TALK ABOUT THE PRACTICAL USES OF MATH

Discuss how math can be useful (and fun) for practical challenges, from shopping to understanding baseball.

TALK ABOUT WHY PEOPLE LAUGHED AT RAYE'S PLAN

Discuss how some people felt—and some still feel—that girls and Black children do not have the ability to do math. Ask your child whether they have ever experienced someone holding incorrect stereotypes like these.

TALK ABOUT MOTIVATION

Ask your child about their experience when they are faced with a really hard task. How do they feel about it? What do they do?

Try to come up with some of your own questions and comments, too!

Activity After Reading

EXPLORE INFORMATION ON WOMEN MATHEMATICIANS.

Check out these sites:

https://www.womendomath.org/profiles/

https://www.lathisms.org/calendars/calendar-2021

https://mathematicallygiftedandBlack.com/

Guide by Herbert P. Ginsburg

Nothing Stopped Sophie by Cheryl Bardoe and Christina Wald

AGE LEVEL 6–9 years

About the Story

As a girl, Sophie Germain, born in 1776, was captivated by using math to solve important problems, like measuring the size of the earth. Her parents did everything they could to squash Sophie's passion, because girls were not supposed to do math at that time. But nothing stopped Sophie! After secretly studying math at the university (where girls were not allowed), she persisted in doing math and eventually won a prestigious prize for solving a really hard math problem.

Words to Learn

MATH WORDS

measure lengths, tally (add up), patterns of vibration, calculations, balance, equations

OTHER WORDS

scoffed, indulge, equality, scholar, prodigy, francs, Royal Academy of Sciences, finery, cobblestones, prestigious, perseverance

About the Math

This book is mostly about Sophie Germain's persistence in doing math, despite prejudices against girls' and women's math abilities. Children can learn:

- Math can be used to solve important practical problems, like measuring the size of the earth.
- Girls and women can do math as well as boys and men.
- Do not give up on your passions, even when others discourage you.
- A little about how vibrations affect objects' movements.

Talk During Reading

DISCUSS HOW SOPHIE'S PARENTS REACTED TO HER INTEREST IN MATH

At first, Sophie's parents tried to prevent her from doing math. Why did they do that? After a while, they changed their minds. Why?

DESCRIBE SOPHIE'S FEELINGS

What was Sophie's mathematical dream? How strongly did Sophie feel about math?

TALK ABOUT YOUR CHILD'S FEELINGS

Is there anything you feel really strongly about, like Sophie?

EXPLAIN THE APPLICATIONS OF MATH

How can you use math to help you do things? (For example, you can count out how many quarters you have, measure the right amount for a recipe, see what time it is, and much more!)

Try to come up with some of your own questions and comments, too!

Activity After Reading

READ ABOUT THE WINE GLASS EXPERIMENT IN THE BACK OF THE BOOK

Wet your finger and run it around the rim of a wine glass. Listen!

Written by Herbert P. Ginsburg

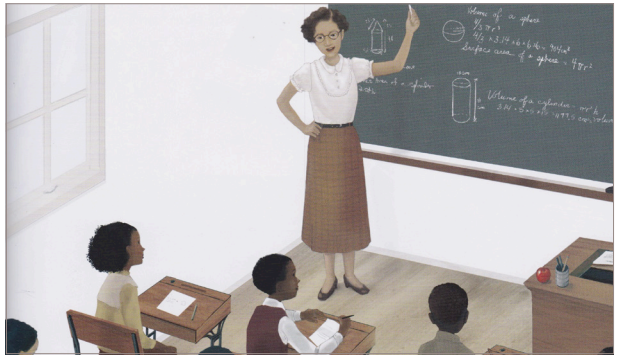
Counting on Katherine

by Helaine Becker and Dow Phumiruk

AGE LEVEL 7–9 YEARS

About the Story

Katherine Johnson wanted to become a research mathematician. But she faced many obstacles, including segregated schools and a lack of job opportunities for women. Katherine began teaching elementary school. In the 1950s, the new U.S. space program hired women mathematicians, including Katherine, who calculated—by hand!—numbers essential for designing the spaceship. Later, she was responsible for plotting the route home for the damaged Apollo 13 spaceship. She had achieved her goal.



Words to Learn

universe, research mathematician (someone who makes discoveries about math), catapulted, graph, reputation, astronaut, triumph

About the Math

As children read the book, they can learn about these topics:

- A simple model explains a rocket ship's trajectory in space.
- Black children faced discrimination in school.
- Girls and women were (wrongly) not considered capable of doing mathematics or engineering (or much else!).
- Although very angry at the discrimination she faced, Katherine persisted to overcome these obstacles and make a vital contribution to the space program.

Math Talk During Reading

TALK ABOUT THE JOY OF KATHERINE'S WORK

Why do you think Katherine enjoyed working on math problems, even though they were often very hard?

TALK ABOUT MOTIVATION

Have you been blocked from doing something you really wanted to do? How did you react?

TALK ABOUT SCHOOL DISCRIMINATION

In Katherine's time, Black children were not allowed to go to school with White children in the United States. How do you think the Black children felt about this? How do you think the White children felt?

TALK ABOUT JOB LIMITATIONS FOR WOMEN

Discuss how many women had (and still have) difficulty going into certain professions. "Do you know of any women who are not teachers or nurses? What do they do?"

Try to come up with some of your own questions and comments, too!

Activity After Reading

EXPLORE INFORMATION ON WOMEN MATHEMATICIANS

Check out these sites:

https://www.womendomath.org/profiles/

https://www.lathisms.org/calendars/calendar-2021

https://mathematicallygiftedandBlack.com/

Guide by Herbert P. Ginsburg

Zero the Hero

by Joan Holub and Tom Lichtenheld

AGE LEVEL 7–10 YEARS

About the Story

In this hilarious and math-rich story, Zero thinks he is a Hero but the other numbers don't agree. After all, you can't count nothing. And if you add 0 to another number or subtract 0 from it, nothing happens. Sometimes the numbers even think Zero is a donut or the letter O. But one day, when they are captured by vicious Roman Numerals, the numbers cry out for help. Zero the Hero comes to their rescue. What is his magic power?

Words to Learn

MATH WORDS

ten ones, circular, random, divisor, times tables, infinity, round off, round down, round up, odd, Roman numerals, ones, tens and hundreds places

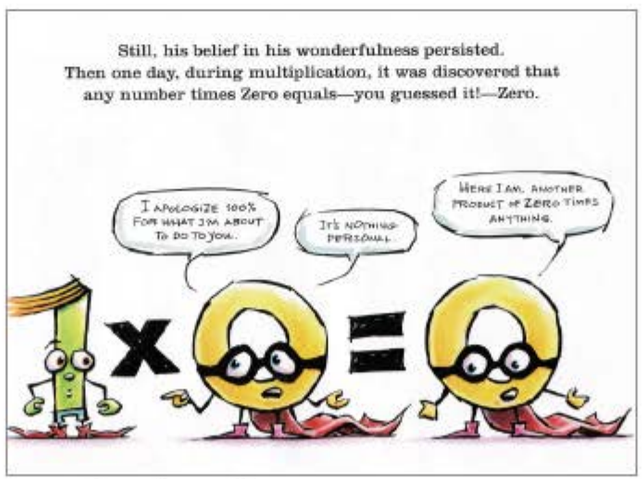
OTHER WORDS

glamorous, virtually, invisible, frustration, extinction, realization, confidence, oblivion, encountered, gladiators

About the Math

There is *lots* of math in this book. Your child can learn what the number 0 cannot and can do:

- Adding 0 to a number does not change it.
- Subtracting 0 from a number does not change it.
- Multiplying any number by 0 results in 0.
- You can't divide any number by 0.
- Writing a 0 to the right of any number produces a tens number (and then hundreds and thousands…).
- Rounding up and down sometimes requires a number with 0 on the right.



Math Talk During Reading

TALK ABOUT THE ROLE OF ZERO IN MULTIPLYING

"Multiplying 7 by 2 is like adding 7 two times. How much is 7 times 0? Why?" (Zero, because you're not adding 7 at all.) "How much is 0 times 7? Why?" (Zero, because seven zeros add up to nothing.)

TALK ABOUT THE FRUIT STORY PROBLEM

"What is the problem the numbers are trying to solve? Why do they need Zero?"

TALK ABOUT THE ROUND-OFF PROBLEM

"What are 1 and 3 trying to do? What is rounding down? What are 2 and 8 trying to do? What is rounding up?"

Try to come up with some of your own questions and comments, too!

Activity After Reading

MAKE UP NUMBER STORIES

Help your child make up a story about numbers. Among the questions you can ask: "Can you think about an adventure that numbers might have? What do numbers do to have fun? Does something strange or weird or scary happen? Are the numbers happy or sad?"

Guide by Herbert P. Ginsburg