Value of Words

Why

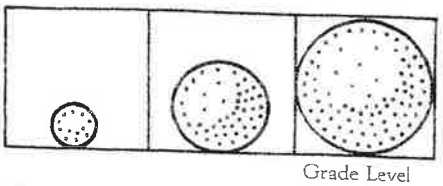
To practice mental arithmetic and estimation while problem-solving

How

- ☐ Assign values to the letters of the alphabet, as shown:
- ☐ Have each person in your family find the value of his or her first name.
- ☐ Add up the numbers without using paper and pencil if you can.
- ☐ What is the most expensive word each of you can find?
- ☐ Can you find a word worth exactly $50? $100?

More Ideas

- ☐ You and your child may want to make up different activities, such as:
  - ☐ Hold a week's contest to find the most expensive word.
  - ☐ Use penny values instead of dollars.
  - ☐ Find the difference between your first and last names.
  - ☐ Multiply the values instead of adding them.
  - ☐ Use fractional values, so that A=1/26, B=2/26, etc.



Grade Level

TOOLS

Pencil
Paper

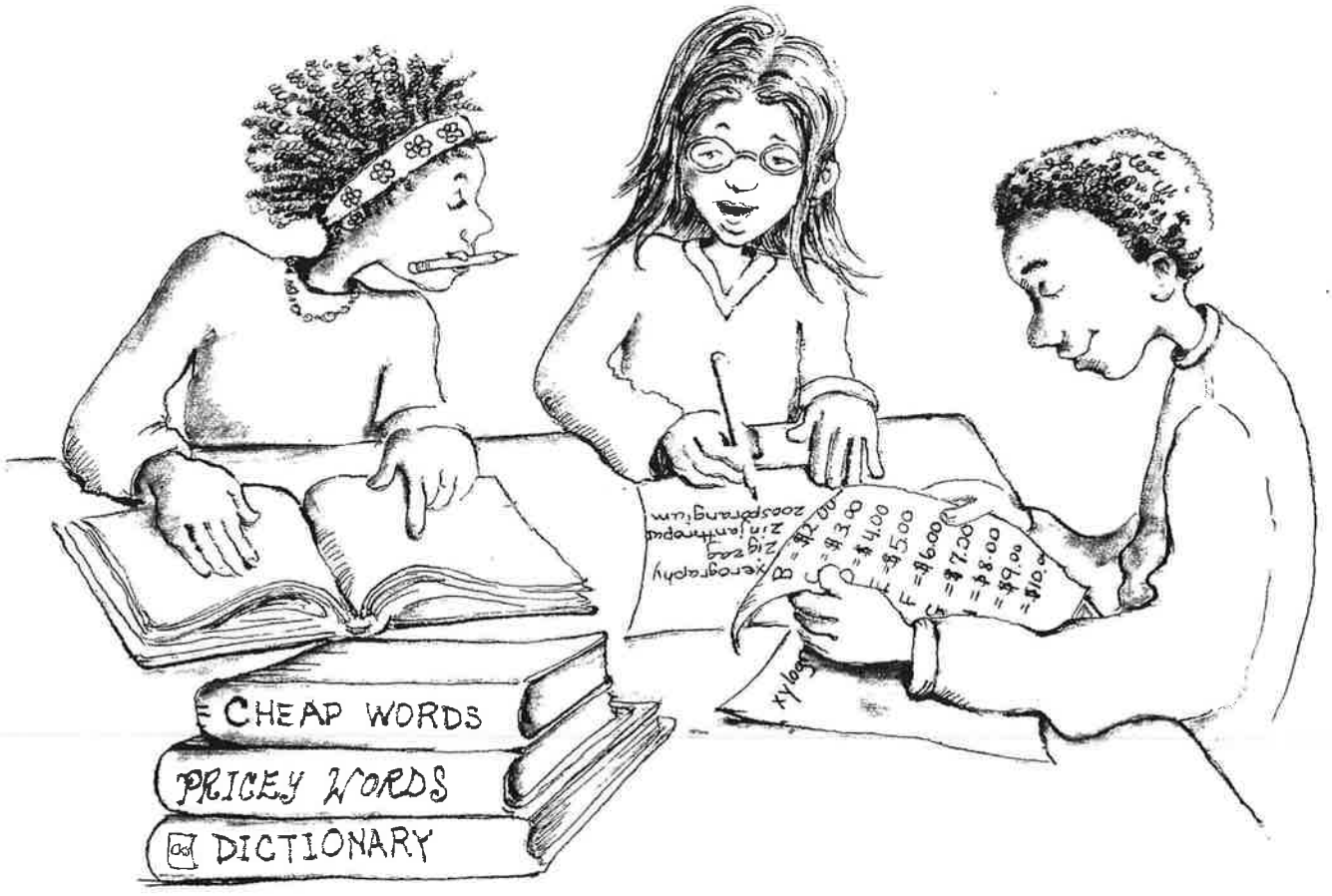
A = $ 1	N = $14
B = $ 2	O = $15
C = $ 3	P = $16
D = $ 4	Q = $17
E = $ 5	R = $18
F = $ 6	S = $19
G = $ 7	T = $20
H = $ 8	U = $21
I = $ 9	V = $22
J = $10	W = $23
K = $11	X = $24
L = $12	Y = $25
M = $13	Z = $26

Number sense

Value of Words Revisited

This activity is an extension to the *Value of Words* activity in the original *FAMILY MATH* book.

This activity provides experiences examining a series of cases for a mathematical question. The kind of thinking involved is important in algebra and geometry, as well as many other advanced mathematics courses.



Value of Words Revisited - Continued

MATERIALS
pencil and paper
calculators

WHAT'S THE MATH?
Mental arithmetic; estimation; logical thinking.

How

• Assign values to letters as shown.

A = $1	J = $10	S = $19
B = $2	K = $11	T = $20
C = $3	L = $12	U = $21
D = $4	M = $13	V = $22
E = $5	N = $14	W = $23
F = $6	O = $15	X = $24
G = $7	P = $16	Y = $25
H = $8	Q = $17	Z = $26
I = $9	R = $18	

• Work with your family to see how many words you can find with values from $1 to $100. Keep a record of your work to share with others.

• Are there any values between $1 and $100 you think will be impossible to find words for? If this is so, can you explain why? Might your answer be different for a language other than English?

• Collect words from the whole group to see how many different words you have found for each value.

• Can you find a sentence worth $1,000? $1,500? $2,000? ■

Extensions

- Find values for words from languages other than English. Some languages such as Hawaiian and Finnish have more vowels and longer words than English. Some, such as Polish or Welsh, have more consonants. How do you think these conditions will affect the value of common words in Hawaiian, Finnish, Polish, and Welsh? Look in the library for dictionaries to help answer this question.

Statistics Extension

- Work on this activity two or three times. Then, collect all of the words. Use a graph to examine and determine information such as most frequent letter, least frequent vowel, etc., in the word collection. Discuss the results with your family.

Measurement & Estimation

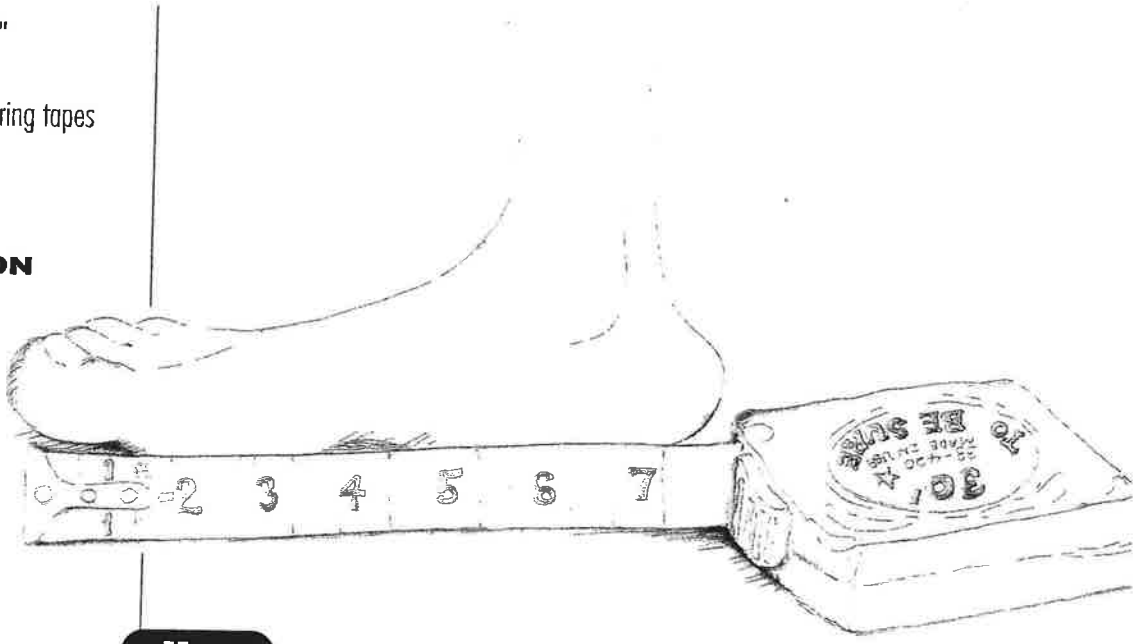
2-6

MATERIALS

1 or 2 rulers, 30 cm or 12"
meter and yard sticks
metric and standard measuring tapes
paper and pencils
objects to measure

MATH CONNECTION

Estimation is a very important skill in mathematics. It is particularly important in measurement. This activity provides an approach to making more accurate estimates when measuring length.



REAL-WORLD CONNECTION

Quite often you need to make a good estimate of a measurement when you don't have a ruler with you. This can happen when you want to know if a table on sale will fit next to your bed or if a picture frame is big enough for your new 11" by 17" poster. Many people use a part of their body such as a hand or foot to help estimate measurements in these situations.

How

- Ask your family if they know some measurements that they use to help them make estimates without a ruler.
- Discuss how you could use body measurements or "units," such as hand span or stride, to help you make estimates when you don't have a ruler.
- Make some measurements of your own body "units." Study the measurements to see which come out close to whole inches or centimeters. Make a note of the results you might want to use to help make estimates.

Some examples of body units to include are:

width and/or length of little finger
hand span
arm span
foot length—with a particular pair of shoes or barefoot
stride
fist circumference
floor to waist

Measurement & Estimation - Continued

This is about becoming more accurate in estimating, measuring, and organizing information.

- Can you think of other body units that would be helpful?

YOUR BODY UNIT	ACTUAL MEASUREMENT

- Measure the length of some objects using your body units. Then compare those measurements by using a ruler or tape measure.

OBJECT	BODY UNIT	ESTIMATE	ACTUAL MEASURE
FAMILY CAR			
BATHTUB			
YOUR BED			
FAMILY PET			
SKATEBOARD			

* Don't forget to make an estimate first.

Here's More

- Find out how things were measured before rulers.
- Take a survey of your friends and acquaintances. Ask them how they estimate measurements when they don't have a ruler or other measuring tool with them.

About Your Height and More

3-6

MATERIALS

pens
graphs
non-stretchy string
scissors

REAL-WORLD CONNECTION

A ratio can be expressed as:

- a probability, like flipping a coin
- a percent—70% chance of rain
- a speed—55 miles an hour
- an average-average income, taking the total salaries divided by the number of people

Collecting data and examining it for trends is important in the field of statistics. This kind of procedure is used in all experimental sciences and many social sciences such as business and economics.

About Your Height and More – Continued

This is about measuring, estimating, and organizing data to understand ratios.

This activity invites us to explore ratio by looking at how our height compares with different body measurements.

In About Your Height and More, when you compare the length of your body height to the number of times that length will circle your fist, foot, and so on, you are making a comparison of 2 parts. After the data is recorded for each person, look for common ratios for different pairs of measurements.

How

- Ask a friend or family member to help you cut a string that measures your height.
- Keep a record of everyone's answers to the questions below. Use one color pen for adults and a different color for children.
  1. How many times does the string measuring your height go around your head? Be sure to write your own answers as a ratio. See *About Ratio's* for two ways to do this.
  2. How many times does the string go around your wrist?
  3. How many times does the string equal your foot's length?
- What do you notice? Are these ratios true for everybody? Discuss your reasoning.

Here's More

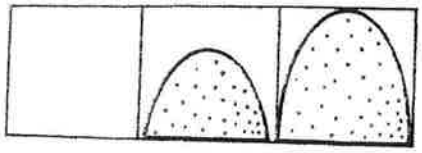
- Cut a string that is the length of your foot. Estimate how many times the string you cut will go around your fist.
- How close was your estimate? Compare your measurement with other family members' measurements.
- Can you make any general statements about body measurements and their relationships to each other?

Note: Did you know that some people shop for socks using their fist as a measurement for their sock length? Discuss how you might use the information from your foot and fist measurements when shopping for socks.

ABOUT RATIOS

A ratio is a way of comparing two values. The ratio of any value a to any value b can be written either in fraction form that is, as $\frac{a}{b}$ or in the form a:b.

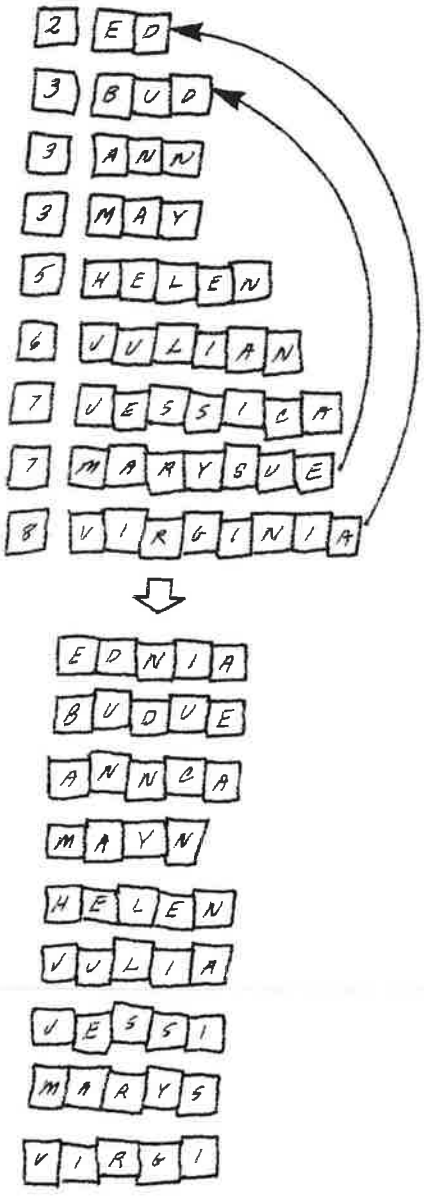
How Long Is a Name?



Grade Level

TOOLS

1" squares
Pencil
Paper
Glue



Why

To introduce the statistical concepts of mean, median, and mode, and to provide practice in making a bar graph

How

- ☐ Make a list of the names of your family and some relatives or friends.
- ☐ Write the letters of each name on the 1" squares, using one square for each letter.

- ☐ Write the number of letters in each name, and the person's initials, on another square.

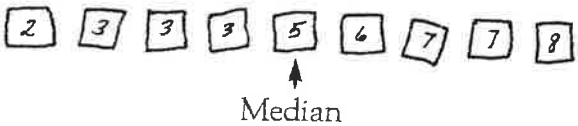
- ☐ Line up the names from longest to shortest, as shown in the picture.

Mean

- ☐ Find the average that is called a **mean** of the lengths of the names. To do this, move letters from the longer names to fill in the shorter ones, until all the rows have the same number of letters. (It doesn't matter where the letters go, as long as the rows have the same number of letters, or as close as possible.)
- ☐ The **mean** in our example is a little less than five, because all the names evened out to be five letters long, except one.

Median

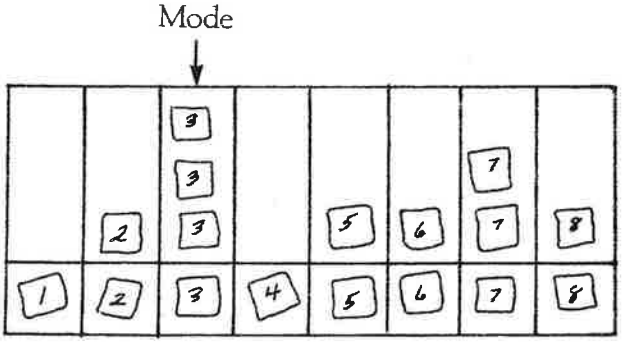
- ☐ Now put out the squares with the numbers that tell how long each person's name is. Arrange them in numerical order:



- ☐ Find the center number in the row. This is the **median.** In our example, "5" is in the middle, so **five** is the median for this example. If there are two numbers in the middle, add them together and divide by two to compute the median.

Mode

- ☐ Next, glue all of the numbers onto a bar graph like the one shown here. Look for the number which occurs most often. This is called the **mode**.



To summarize, our sample group has:

a **mean** name length of 4.8,

a **median** of 5, and

a **mode** of 3.

- ☐ What happened with your group of names?

More Ideas

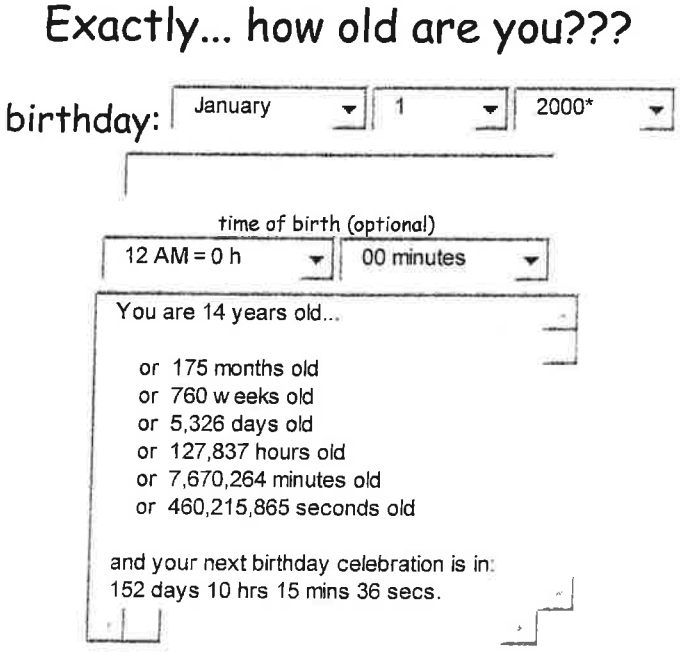
- ☐ Talk about the difference between means, medians, and modes. Why don't they all come out the same?
- ☐ Can all graphs have means and medians?
- ☐ Can there be a graph that has the same number for the mean, median and mode?

How Old are You?

Have students calculate their ages by how many months, weeks, days, hours they are old. Below is a website with a calculator. Have them go to the website and compare their answers.

Go to http://www.mathcats.com/explore/age/calculator.html

12 months = 1 year
1 year = 52 weeks + 1 day
52 weeks = 364 days
1 week = 7 days
1 day = 24 hours
1 hour = 60 minutes



THE STORY

- ✓ Story book is located in purple KidzMath kit (grades 3rd-6th)
- ✓ Refer to KidzMath story guide for Math activities

STORY SUMMARY

Cowlick is a one-barber town until Buzzsaw Bart shows up. Louie Cutorze has a unique way of cutting hair and so does Buzzsaw Bart. The two barbers have a showdown at high noon to see who will stay and who will leave Cowlick. They realize that they can learn from each other and have a thriving business working together.

NEW WORDS

The children may be unfamiliar with these words. Discuss them when they appear in the story. You will find the definitions on page 20.

cowlick
voila
cranium
noggin
varmint

BEFORE THE STORY

Get Ready

1. The *Leader's Guide* section "The Leader's Role" will help you make the most of the story guide activities. If you haven't yet read it, please do so.
2. Read the book to yourself before reading it to the children.
3. Think about the math and social questions you want to ask before, during, and after the story. Write them on self-stick notes and put them in the book where you will stop to ask the questions.

TiP

The "Talk About" sections suggest questions and discussion topics. You do not need to ask all the questions. Choose ones that make sense for your group of children.

Introduce

Show the cover of the book and read the title.

TALK ABOUT

- **What do you think this story might be about? Why do you say that?**
- **Why do you think part of the title is *A Math Adventure?***

DURING THE STORY

Read the story aloud.

TALK ABOUT

After reading page 7, ask:

- **Have you ever used this method to scale down a drawing (reduce it or make it smaller)? If yes, what did you do? Have you used a different method? What did you do? Why does Louie divide all his measurements by four?**
- **Why might you want to make a picture larger or smaller?**

After reading page 16, ask:

- **What do you think they are going to do at high noon?**
- **What else could Buzzsaw and Louie do to settle their differences?**

AFTER THE STORY

Discuss the story.

TALK ABOUT

Point out the population totals in the illustration on page 32, and ask:

- **Why do you think the population of Cowlick increased?**
- **What did Buzzsaw and Louie learn from meeting each other?**
- **What kinds of mathematics were the barbers using to scale up and scale down the pictures (make them larger and smaller)?**

THE STORY

✓ Story book is located in purple KidzMath kit (grades 3rd-6th)

✓ Refer to KidzMath story guide for Math activities

STORY SUMMARY

Chico, a third-grader who moves from place to place depending on the crop his father is harvesting, starts at a new school. He has had many first days of school, and they haven't always been good. What will happen on his "first day in grapes"?

NEW WORDS

The children may be unfamiliar with these words. Discuss them when they appear in the story. (You will find the definitions on page 20.)

migrant
crate
salsa
macho

These Spanish words are defined in the story.

abuela
ándale
hola
buenos días
amigo
señorita
buenas tardes
pronto

BEFORE THE STORY

Get Ready

1. The *Leader's Guide* section "The Leader's Role" will help you make the most of the story guide activities. If you haven't yet read it, please do so.
2. Read the book to yourself before reading it to the children.
3. Think about the math and social questions you want to ask before, during, and after the story. Write them on self-stick notes and place them in the book where you will stop to ask the questions.

Introduce

Show the cover of the book and read the title.

TALK ABOUT

- **What do you think this story might be about?**
- **What are the people behind the boy doing?**

DURING THE STORY

Read the story aloud.

TIP

Ask the "Talk About" questions you chose when you were preparing to read the story. Ask open-ended questions with more than one correct answer (for example, "How did you figure out your answer? What's another way?").

TALK ABOUT

After reading "Can you do fifty-nine plus ninety-four?", let the children try to solve the problem in their heads. Ask:

- **Could you figure it out in your head? How did you do it?**
- **How do you think Chico can figure out the answer so quickly? Why is it difficult to add those two numbers in your head?**
- **Why is it important to learn to do math in your head?**

After reading "...Twenty-five and seventy-two," give the children a chance to figure it out. Ask:

- **Why did Chico say this was an easy one?**
- **How did you figure it out?**

After reading "What if you take sixty-five crates of dried grapes and add seventy-seven crates to it? How many crates of raisins do you get?", give the children time to figure it out in their heads. Ask:

- **How can you figure out a problem like this without a pencil and paper?**
- **How do you think Chico got so good at this?**

AFTER THE STORY

Discuss the story.

TALK ABOUT

- **What did Chico do to get out of a hard situation with the bullies? What would you have done? What is another way Chico could have handled the situation?**
- **Why did the bullies walk away?**
- **Have you ever moved and started at a new school? What was that like?**

THE STORY

- ✓ Story book is located in purple KidzMath kit (grades 3rd-6th)
- ✓ Refer to KidzMath story guide for Math activities

STORY SUMMARY

Bessie Coleman, born in rural Texas in 1892, showed tremendous courage and determination as she successfully fulfilled her dream of becoming an airplane pilot. This book tells how she went from picking cotton in Waxahaxie, Texas, to learning to fly in France, to performing air shows across the United States. Bessie Coleman was the first African-American airplane pilot. She inspires others to keep trying to "fly high!"

NEW WORDS

The children may be unfamiliar with these words. Discuss them when they appear in the story. (You will find the definitions on page 20.)

tenant farm
Civil War
foreman
aviator
aviatrix
Victrola
passport
cockpit

French words:

bonjour (*bon-jure*)
au revoir (*o-re-vwar*)
c'est la vie (*say-la-vee*)
très chic (*tray-sheek*)

BEFORE THE STORY

Get Ready

1 The *Leader's Guide* section "The Leader's Role" will help you make the most of the story guide activities. If you haven't yet read it, please do so.

2 Read the book to yourself before reading it to the children. There are several references to God and the Bible in the first few pages of the story. If you are uncomfortable reading those sentences, skip them or rephrase them to suit your needs.

3 Think about the math and social questions you want to ask before, during, and after the story. Write them on self-stick notes and put them in the book where you will stop to ask the questions.

TIP

You may want to read this story in two sittings because it is long. For example, you may want to read up to the page titled "Off to France" for the first sitting.

Introduce

Show the cover of the book and read the title.

TALK ABOUT

- **Who was Bessie Coleman?**

If the children do not know who Bessie Coleman was, explain that she was an African-American woman who followed her dream to become an airplane pilot. Many people who saw her or read about her followed her example to "fly high" and follow their dreams.

TALK ABOUT

- **What do you dream of doing in the future? How do you think you could fulfill your dreams?**
- **Have you ever set a goal to do something and then reached your goal? What happened?**

DURING THE STORY

Read the story aloud.

TALK ABOUT

After reading the page about Bessie's mother, Susan Coleman, and the Civil War, ask:

- **What was the Civil War?** (In 1861, the northern and southern states went to war with each other. One of the reasons for this was that the North wanted to free the slaves and the South did not. The North won the war in 1865 and the slaves were set free.)

After reading the page where Bessie checks the foreman's numbers, ask:

- **What does Bessie's mom mean when she says that Bessie would be "somebody"?** (If it doesn't come up from the children, explain that this means she would work hard and do something with her life that went beyond what was expected of her.)

After reading the page where Bessie walks nine miles to and from her French flight school, ask:

- **How many miles did Bessie walk each day? How long do you think it took her? What is the farthest you think you have walked?**

AFTER THE STORY

Discuss the story.

TALK ABOUT

- **Who was Bessie Coleman?**
- **What do you think of Bessie Coleman? Why? What are other opinions?**
- **After Bessie became a pilot, she went to African-American schools and churches to inspire others to do positive things with their lives. Who inspires you? Why do they inspire you? What do they inspire you to do?** (This person doesn't have to be someone famous. It may be a neighbor, parent, grandparent, sibling, or coach.)