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**[Go to \*Grade 1 Everyday Mathematics\* Sample Lesson](#)**

4•3

# Personal "Foot" and Standard Foot



**Objectives** To provide practice measuring with a nonstandard unit and with the standard foot; and to facilitate understanding of the need for standard units.

## 1 Teaching the Lesson

### Key Activities

Children measure objects with their personal feet and with a standard foot.

### Key Concepts and Skills

- Use language of approximation when measuring. [Measurement and Reference Frames Goal 1]
- Measure length with nonstandard units. [Measurement and Reference Frames Goal 1]
- Measure length to the nearest foot. [Measurement and Reference Frames Goal 1]

### Key Vocabulary

foot • feet • standard foot

**Ongoing Assessment: Informing Instruction** See page 288.

## materials

- Math Journal 1, p. 60
- Home Link 4•2
- Teaching Master (*Math Masters*, p. 97; 2 per child)
- 8½" by 11" or larger construction paper
- scissors

See Advance Preparation

## 2 Ongoing Learning & Practice

Children play *Coin-Dice* to practice making coin exchanges.

Children practice and maintain skills through Math Boxes and Home Link activities.

**Ongoing Assessment: Recognizing Student Achievement** Use journal page 61. [Patterns, Functions, and Algebra Goal 1]

## materials

- Math Journal 1, p. 61
- Home Link Master (*Math Masters*, p. 98)
- Foot-Long Foot (*Math Masters*, p. 97)
- tool-kit coins
- 2 dice per partnership

## 3 Differentiation Options

### READINESS

Children measure the length of flat surfaces with nonstandard units.

### ENRICHMENT

Children listen to and discuss the book *How Big Is a Foot?*

### ELL SUPPORT

Children add *foot* to their Math Word Banks.

## materials

- Differentiation Handbook*
- How Big Is a Foot?* by Rolf Myller
- number cards (from the Everything Math Deck, if available)

## Additional Information

**Advance Preparation** For Part 1, cut 1-foot strips of construction paper in case children need additional feet for measuring.

## Technology



**Assessment Management System**  
Math Boxes, Problem 2  
See the iTLG.

# Getting Started

## Mental Math and Reflexes

Tell “change-to-more” and “change-to-less” number stories. Have children solve them any way they can and then share their solution strategies. Summarize each solution by drawing a “change-to” diagram and by writing a number model. If children are able, ask volunteers to complete the diagrams or write the number models. Although children should not be expected to do either of these things at this time, this is an opportunity to revisit these developing skills.



- Brielle woke up to find that it was about 28°F. By lunchtime, it had warmed up about 5 degrees. What was the temperature at lunchtime? **About 33°F**
- The warmest temperature Thursday night was about 52°F. By morning, the temperature had cooled down about 12°F. What was the temperature Friday morning? **About 40°F**
- Ming saw that it was raining. He noticed that it was about 35°F. An hour later, the rain turned into snow and the temperature had dropped to about 25°F. How much colder was it? **About 10°F colder** Why do you think the rain turned to snow? **The temperature fell below 32°F, the temperature at which water freezes.**

## Math Message

An adult and a child measured the same thing with their feet. Why might they get different answers?



## Home Link 4-2 Follow-Up

Volunteers share how they measured their beds. Why do you think different children might get different hand-span measures? **Their beds may be different sizes, and their hands are probably different sizes.**



# 1 Teaching the Lesson

## ▶ Math Message Follow-Up



WHOLE-CLASS  
ACTIVITY

Invite children to share their answers to the Math Message problem. Ask them why they think their answers are different. **Their feet are different lengths.** Then do the following:

1. Measure heel to toe the number of teacher feet it takes to measure a marked distance across the floor. Have children count the steps. Point out that you are leaving no gaps between your feet. Record the total number of teacher feet.
2. Next, have a child follow the same procedure to measure the same distance. Make sure that the child leaves no gaps. Record the total in child feet. Use the child’s name to describe the unit, such as *Jane feet*.
3. Discuss who got the larger total number of units. Informally develop the idea that it takes more small units than large units to measure something.

## ▶ Measuring with Construction-Paper Cutouts of Children’s Feet

(*Math Journal 1*, p. 60)



PARTNER  
ACTIVITY

Pass out construction paper, one piece per child. Partners trace each other’s foot onto the paper, either with or without shoes. Then each partner cuts out the foot and writes his or her name on it.

## Student Page

Date \_\_\_\_\_ Time \_\_\_\_\_

### LESSON 4-3 My Foot and the Standard Foot

Measure two objects with the cutout of your foot. Draw pictures of the objects or write their names.

1. I measured **Answers vary.**

It is about \_\_\_\_\_ feet.  
(your name)

2. I measured

It is about \_\_\_\_\_ feet.  
(your name)

Measure the same two objects with the foot-long foot. Sometimes it is called the *standard foot*.

3. I measured

It is about \_\_\_\_\_ feet.

4. I measured

It is about \_\_\_\_\_ feet.

*Math Journal 1*, p. 60

**NOTE** If time is short, rather than have children trace and cut out their feet, have them take off their shoes and use the shoes as their personal “feet” for measuring.



Children develop their measuring skills.

**NOTE** Overlapping and leaving gaps between units may cause differences in measurements for the same items.



### Ongoing Assessment: Informing Instruction

Watch for children who are ...

- overlapping units.
- leaving gaps between units.
- not naming the measurement to the nearest unit.
- alternating their foot with a partner’s when they should be measuring only with their personal foot.

Bring the group together and compare children’s personal foot-length measurements. Children with different-sized foot tracings will get different foot measurements for the same item. Ask children what they might do to solve the problem.



### Adjusting the Activity

Children cut out four or five feet from construction paper. Each child can then practice lining up the feet—without gaps and without overlapping—to measure objects. When each child is ready, have him or her work on measuring with two feet and then finally with only one foot.

AUDITORY ♦ KINESTHETIC ♦ TACTILE ♦ VISUAL

## ▶ Measuring with a Standard Foot-Long Foot



PARTNER ACTIVITY

(*Math Journal 1*, p. 60 and *Math Masters*, p. 97)

Children cut out one foot-long **foot** from copies of *Math Masters*, page 97.

Partners remeasure the same two objects that they measured with their personal “foot.” Partners measure the objects independently but collaborate to agree on a number that is close; for example, “a little more than 2 feet.” Objects will usually be longer or shorter than a whole number of **feet**.

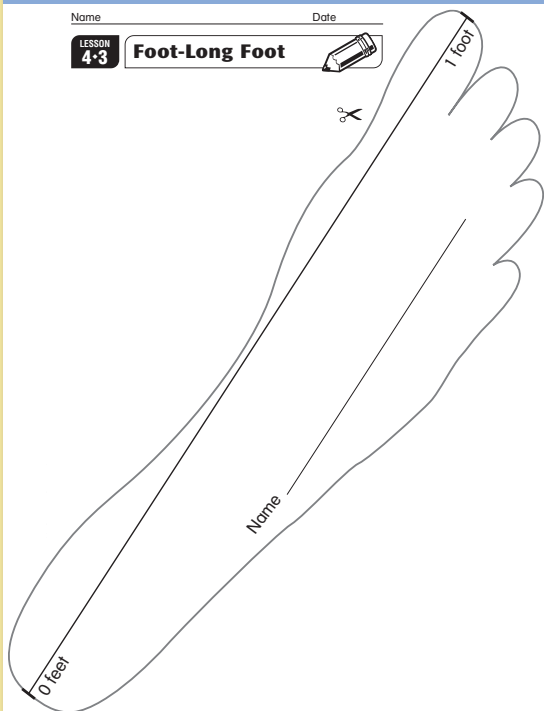
Children record their two measurements, using a **standard foot**, in Problems 3 and 4 on journal page 60. As with all measurements, encourage children to use the language of approximation: *about* \_\_\_ feet, *a little less than* \_\_\_ feet, or *about halfway between* \_\_\_ and \_\_\_ feet.

Discuss why children were able to find a number to agree on when they were using the foot-long foot. **They were measuring with a tool that was the same length.**

Have children fold and save their foot-long feet for use in Lesson 4-4.

### Teaching Master

Name \_\_\_\_\_ Date \_\_\_\_\_  
**LESSON 4-3** **Foot-Long Foot**



*Math Masters*, p. 97

# 2 Ongoing Learning & Practice

## ▶ Playing *Coin-Dice*



PARTNER  
ACTIVITY

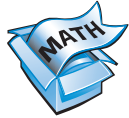
Children practice making coin exchanges by playing *Coin-Dice*. For detailed instructions, see Lesson 3-12.

## ▶ Math Boxes 4•3

(*Math Journal 1*, p. 61)



INDEPENDENT  
ACTIVITY



**Mixed Practice** Math Boxes in this lesson are paired with Math Boxes in Lesson 4-1. The skills in Problem 4 preview Unit 5 content.



### Ongoing Assessment: Recognizing Student Achievement

Math Boxes  
Problem 2 ★

Use **Math Boxes, Problem 2** to assess children's ability to solve Frames-and-Arrows problems. Children are making adequate progress if they can solve this problem correctly.

[Patterns, Functions, and Algebra Goal 1]



**Writing/Reasoning** Have children discuss, draw, or write an answer to the following question: *How does drawing help you solve a number story?* A reasonable answer should explain the importance of a picture in determining the problem situation and its solution.

## ▶ Home Link 4•3

(*Math Masters*, p. 98)



INDEPENDENT  
ACTIVITY



**Home Connection** In addition to the Home Link, children take home a copy of *The Foot-Long Foot Math Masters*, page 97. Using different-colored crayons, they trace each family member's foot onto the foot-long foot and then compare the foot lengths of their family members.

## Student Page

Date \_\_\_\_\_ Time \_\_\_\_\_

**LESSON 4•3 Math Boxes**

1. What is the temperature today? Is the temperature odd or even?  
**Answers vary.** °F **Answers vary.**

2. What comes next?  
**Rule** Count by 3s  
  
 Fill in the circle next to the best answer.  
 A. 10    B. 11    C. 12    D. 6

3. Draw and solve.  
 Ava had 9 pennies.  
 She lost 4 pennies.  
 How many pennies does Ava have now?  
  
 5 pennies

4. Circle the winning domino in *Domino Top-It*.

*Math Journal 1*, p. 61

## Home Link Master

Name \_\_\_\_\_ Date \_\_\_\_\_

**HOME LINK 4•3 The Foot-Long Foot**

**Family Note** To help us investigate the measuring unit "feet," please help your child mark each family member's foot on page 97, using different-colored crayons.  
 Please return this Home Link to school tomorrow.

Compare the foot-long foot to the feet of members of your family.

Here is what you do:

1. Mark the length of each person's foot onto the foot-long foot. Use a different-colored crayon for each person's foot.
2. Label each mark with the person's name.
3. Talk about why it is not a good idea for people to use their own feet for measuring things.

### Practice

Practice writing the numbers 8 and 9.

4.

5.

*Math Masters*, p. 98

## 3

## Differentiation Options

## READINESS



## ▶ Investigating Length




5–15 Min

To explore approximating length with nonstandard units, have children measure objects by laying cards end to end with no overlap and no gaps. Ask children to measure their desks in the same way. Children compare their answers and their strategies with each other. As time permits, have children work with a partner to measure other flat surfaces in the room. Consider having children record what surfaces they measured and the length of each surface.

## ENRICHMENT

▶ Solving Problems with *How Big Is a Foot?*

15–30 Min

 **Literature Link** To apply children's understanding of standard measurement, engage in problem solving with the book *How Big Is a Foot?* by Rolf Myller (Young Yearling, 1991). Read the first part of the book to the group. Pause and have volunteers share their ideas about why the bed did not fit the queen. Have children propose possible solutions to the problem. Finish reading the book. Discuss the importance of standard measurement units.

## ELL SUPPORT



## ▶ Building a Math Word Bank



5–15 Min

(*Differentiation Handbook*)

To provide language support for measurement, have children use the Word Bank Template found in the *Differentiation Handbook*. Ask children to write the term *foot*, draw a picture representing the term, and write other words that describe it. See the *Differentiation Handbook* for more information.

**LESSON**  
**4•3****My Foot and the Standard Foot**

Measure two objects with the cutout of your foot.  
Draw pictures of the objects or write their names.

**1.** I measured

It is about \_\_\_\_\_ feet.  
(your name)

**2.** I measured

It is about \_\_\_\_\_ feet.  
(your name)

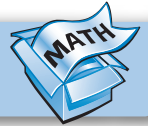
Measure the same two objects with the foot-long foot.  
Sometimes it is called the *standard foot*.

**3.** I measured

It is about \_\_\_\_\_ feet.

**4.** I measured

It is about \_\_\_\_\_ feet.

**LESSON**  
**4•3**
**Math Boxes**
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1. What is the temperature today?

\_\_\_\_\_ °F

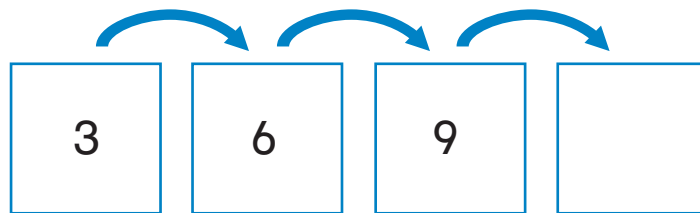
Is the temperature odd or even?

\_\_\_\_\_

2. What comes next?

**Rule**

Count by 3s



Fill in the circle next to the best answer.

- A.** 10     
  **B.** 11     
  **C.** 12     
  **D.** 6

3. Draw and solve.

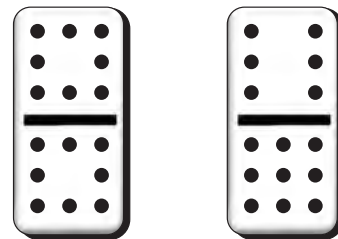
Ava had 9 pennies.

She lost 4 pennies.

How many pennies does Ava have now?

\_\_\_\_\_ pennies

4. Circle the winning domino in *Domino Top-It*.





Name \_\_\_\_\_

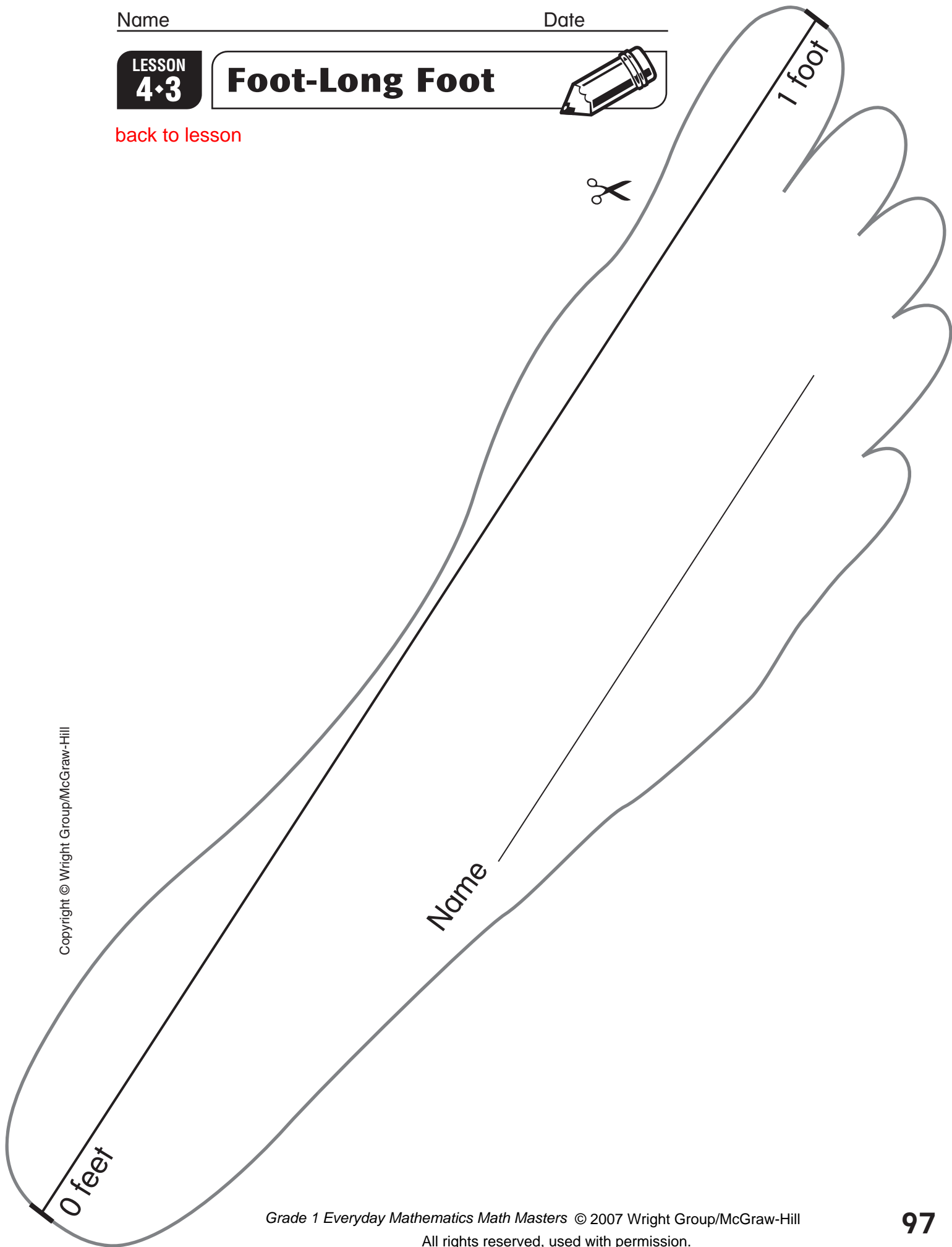
Date \_\_\_\_\_

**LESSON**  
**4•3**

# Foot-Long Foot



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# The Foot-Long Foot

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**Family Note** To help us investigate the measuring unit “feet,” please help your child mark each family member’s foot on page 97, using different-colored crayons.

*Please return this Home Link to school tomorrow.*

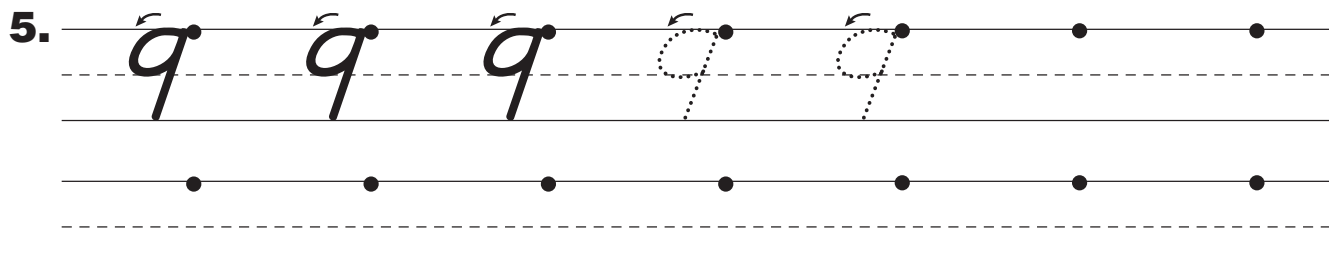
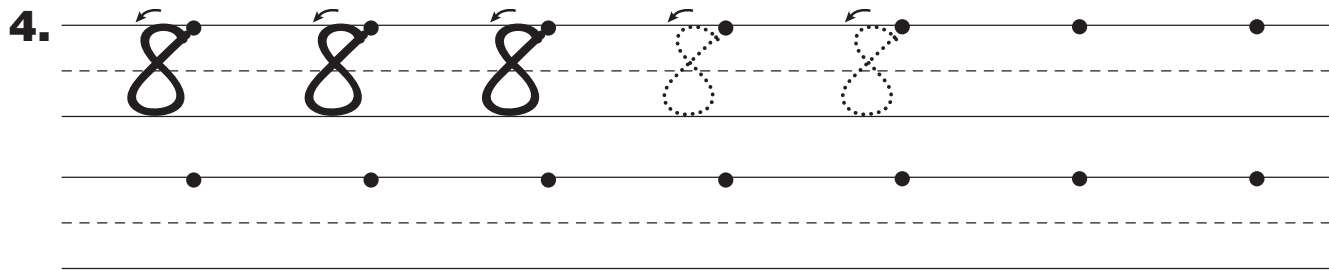
Compare the foot-long foot to the feet of members of your family.

Here is what you do:

1. Mark the length of each person’s foot onto the foot-long foot. Use a different-colored crayon for each person’s foot.
2. Label each mark with the person’s name.
3. Talk about why it is not a good idea for people to use their own feet for measuring things.

## Practice

Practice writing the numbers 8 and 9.



# Math Word Bank A

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