SOMETHING'S A-FOOT TEACHER NOTES (PG. 1 OF 2)

5.NF.B.4; 5.NF.B.6; 5.NF.B.7

Data from Dot Plots with Fractions

Purpose In this activity, students solve problems using data in dot plots and stem–and–leaf plots. The data is written as fractions so students can practice fraction operations while they practice reading data tables and solving problems.

About the Problems: Problem #8 is a challenge! You may wish to place it in a center or use it separately from the rest of the problems.

- ☑ Addition
- ☑ Subtraction
- ☑ Multiplication
- ☑ Division
- ☑ One-step problems
- ☑ Two-step problems
- ☐ Multi-step problems
- ☐ Estimation
- ☐ Teacher-facilitated
- ☑ Small Group
- ☐ Tutoring/Intervention
- ☑ Centers
- ☐ Below & On Grade Level
- ☑ On Grade Level
- ☐ On Grade Level & Advanced
- ☑ Challenge

Setting Up For Instruction

- Make 1 copy of **Something's A-Foot** for each student.

How-To Guide

1. Place students in groups of 2–3 and hand out materials.
2. Have students work together to solve the problems.

Note: Problem #8 is also included as a separate sheet that can be used in centers.

Note About Fraction Models

Students may need to use a model to perform fraction operations. For your convenience, page 101 is a number line recording sheet template. Page 100 is grid paper that may be used if your students are accustomed to working fractions problems using area models.

Answer Key

1. $\frac{7}{8}$
2. 22 people
3. A larger hat. 23.44 > 23.0531
4. 6 more people
5. $\frac{1}{2}$ inch
6. 72 inches long
7. At least $20\frac{1}{2}$ by $20\frac{1}{2}$ inches. *Answers will vary.*
8. $\frac{1}{4}$ inch; $\frac{1}{8}$ inch

Thought Extenders

Questions About the Correct Operation

- Why did you choose this operation? What are the clues in the problem? What actions are taking place in the problem?
- Is the action in the problem putting things together or taking them apart? Is the problem creating groups? Is the problem counting groups? Is the problem separating things into groups?
- Is there a hidden question in the problem?
- How did you know if you needed one operation or two operations to solve the problem?
- Is there unnecessary information in the problem?
- Did you answer the question that was asked?

Questions About Reading Stem–and–Leaf Plots

- What is the stem?
- What is the leaf?
- What number do they make when you put them together?
- How many numbers are the same in the leaves?
- What is the total number of data points?

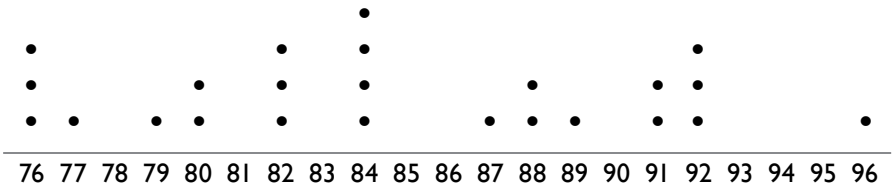
Question About Reading Dot Plots

- What is the total number of data points?
- How many dots (X's) are there? What is their value?

Back to the Table of Contents | Table of Standards

Frequency Tables, Dot Plots, Bar Graphs, and Stem–and–Leaf Plots

Dot plots, frequency tables, and bar graphs are graphs that are used to organize numerical data. Dot plots have a continuous scale across the bottom. A dot is placed above the number in the scale for each data point with that number. The example below shows benchmark grades. The dots represent students. Notice that each number is listed from the lowest grade to the highest.

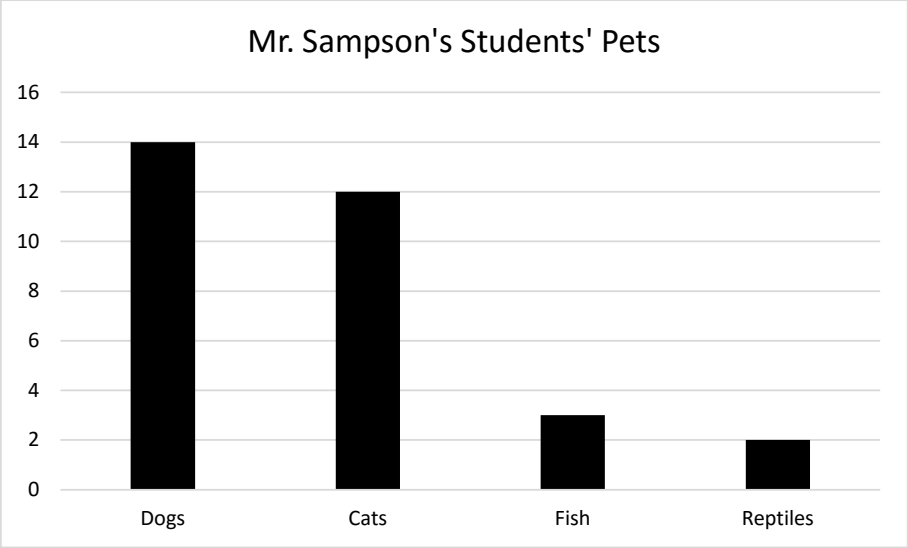


Frequency tables and bar graphs are also ways to organize data into categories. Students should already be familiar with frequency tables from the primary grades, only they knew them as tally charts. Typically, frequency tables are a handy way to capture raw data as the data is being counted. For example, if a person is counting ballots by hand, they might make a frequency table. Once the raw data is captured, it is easy to organize into a bar graph.

In a bar graph, each bar shows a different category of data. The height or length of the bar tells how many data points are in that category. Because categorical data is counting the numbers of things in a category, frequency tables and bar graphs usually use whole numbers.

As students create bar graphs and frequency tables, be sure they can tell you how many data points are in the whole data set and the number of data points in each category.

The frequency table and bar graph below show the same data. The categories are the different kinds of animals. The height of the bar and the number of slashes show how many of each type of animal there are. Adding the bars or counting the slashes gives the total number of data points–in this case, 31.



Mr. Sampson's Students' Pets	
Dogs	𝍸 𝍸 ||||
Cats	𝍸 𝍸 ||
Fish	|||
Reptiles	||

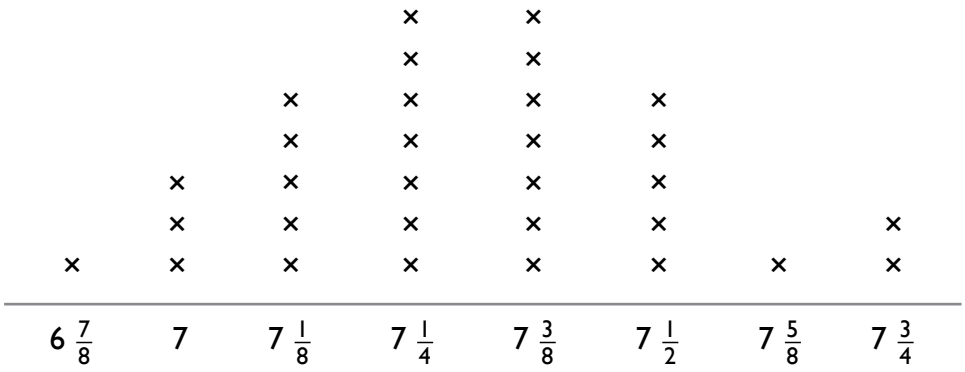
Occasionally, the item to be counted is a number. For example, you can organize your students according to their shoe size. There might be 10 students in your class with size 7 shoes. *Size 7* is a category, not really a number in this case. We could easily change the category to *The Number of Students Who Ride a Bike to School. Size 7* is a label just like *The Number of Students Who Ride Bikes to School is a category.* When we work with this kind of data, we are most concerned with the number in the category, not the category itself.

SOMETHING'S A-FOOT (PG. 1 OF 3)

Name: _____

Directions: Solve each problem.

Have you ever bought a hat? Back in the early to mid-1900s, men wore hats in public, but always took them off whenever they went inside a building. Hats come in sizes that are written as fractions. Below is a table of hat sizes of presidents and other influential people from the 1900s.



(http://www.hatlife.com/headsize.php)

1 What is the difference between the largest hat size and the smallest hat size?

2 Abraham Lincoln's hat size was $7\frac{1}{8}$. How many people had hat sizes larger than President Lincoln?

3 When a gentleman goes to a hat shop to be measured, the haberdasher who sells the hats uses a tape measure to measure around the gentleman's head. A measure of 23.0531 inches corresponds to a hat size of $7\frac{3}{8}$. Would a head that measures 23.44 wear a larger hat or smaller hat than $7\frac{3}{8}$? Why?

4 According to the table, how many more people wear a hat size that is $7\frac{1}{8}$ or smaller than a hat that is larger than $7\frac{1}{2}$?

Name: _____

Did you know that your shoe size is not the same as the length of your foot? The table below shows common shoe sizes for women and men and the corresponding length of feet.

Women's Shoe Sizes	Length of Women's Feet in Inches
5	$8\frac{1}{2}$ in.
$5\frac{1}{2}$	$8\frac{3}{8}$ in.
6	$8\frac{7}{8}$ in.
$6\frac{1}{2}$	$9\frac{1}{16}$ in.
7	$9\frac{1}{4}$ in.
$7\frac{1}{2}$	$9\frac{3}{8}$ in.
8	$9\frac{1}{2}$ in.

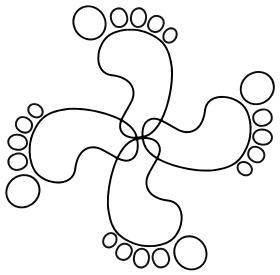
Men's Shoe Sizes	Length of Men's Feet in Inches
6	$9\frac{1}{4}$ in.
$6\frac{1}{2}$	$9\frac{1}{2}$ in.
7	$9\frac{5}{8}$ in.
$7\frac{1}{2}$	$9\frac{3}{4}$ in.
8	$9\frac{15}{16}$ in.
$8\frac{1}{2}$	$10\frac{1}{8}$ in.
9	$10\frac{1}{4}$ in.

(http://www.zappos.com/c/shoe-size-conversion)

5 The average 11-year-old girl wears a women's size 7 shoe. The average 11-year-old boy wears a men's size $7\frac{1}{2}$ shoe. How much longer is the average 11-year-old boy's foot than an 11-year-old girl's foot?

6 It's May and the 5th-grade spring track meet is here! On the girls' 400-meter relay team, two girls wear size 5 shoes and two girls wear size 8 shoes. If you put their feet end to end, how long would the line of feet be? (You can use mental math to solve this problem!)

7 In art class, the teacher has the students create art with their feet. Each student takes off their shoes and paints the bottom of their feet. They use their feet as a stamp to make a flower as shown below.



Jared wears a size 9 shoe. What is the smallest size paper that he could use to create his art project? Why?

Name: _____

The Investigation is A-Foot!

8 Did you know that your shoe size is not the same as the length of your foot?

The table below shows the correlation between shoe size and foot length. Notice that shoe sizes go up by half-sizes—7, $7\frac{1}{2}$, 8, etc. Now look at the lengths of feet compared to the sizes. The lengths of feet do not get longer evenly! Sometimes the difference between the lengths of feet is very small, while sometimes the difference is larger.

Women's Shoe Sizes	Length of Women's Feet in Inches
5	$8\frac{1}{2}$ in.
$5\frac{1}{2}$	$8\frac{3}{4}$ in.
6	$8\frac{7}{8}$ in.
$6\frac{1}{2}$	$9\frac{1}{16}$ in.
7	$9\frac{1}{4}$ in.
$7\frac{1}{2}$	$9\frac{3}{8}$ in.
8	$9\frac{1}{2}$ in.

Men's Shoe Sizes	Length of Men's Feet in Inches
6	$9\frac{1}{4}$ in.
$6\frac{1}{2}$	$9\frac{1}{2}$ in.
7	$9\frac{5}{8}$ in.
$7\frac{1}{2}$	$9\frac{3}{4}$ in.
8	$9\frac{15}{16}$ in.
$8\frac{1}{2}$	$10\frac{1}{8}$ in.
9	$10\frac{1}{4}$ in.

What is the biggest difference in inches between sizes? What is the smallest difference in inches between sizes? Use a ruler to draw the two differences to help you make a good comparison.

Why does it feel like your toes are cramping when you need a new size shoe, even though your feet have only grown a tiny bit?