NAME DATE PERIOD

Unit 8, Lesson 13: What Makes a Good Sample?

Let's see what makes a good sample.

13.1: Number Talk: Division by Powers of 10

Find the value of each quotient mentally.

$34{,}000 \div 10$

$340 \div 100$

$34 \div 10$

$3.4 \div 100$

13.2: Selling Paintings

Your teacher will assign you to work with either means or medians.

1. A young artist has sold 10 paintings. Calculate the measure of center you were assigned for each of these samples:

   a. The first two paintings she sold were for $50 and $350.

   b. At a gallery show, she sold three paintings for $250, $400, and $1,200.

   c. Her oil paintings have sold for $410, $400, and $375.

2. Here are the selling prices for all 10 of her paintings:

$50	$200	$250	$275	$280	$350	$375	$400	$410	$1,200

   Calculate the measure of center you were assigned for all of the selling prices.

NAME DATE PERIOD

3. Compare your answers with your partner. Were the measures of center for any of the samples close to the same measure of center for the population?

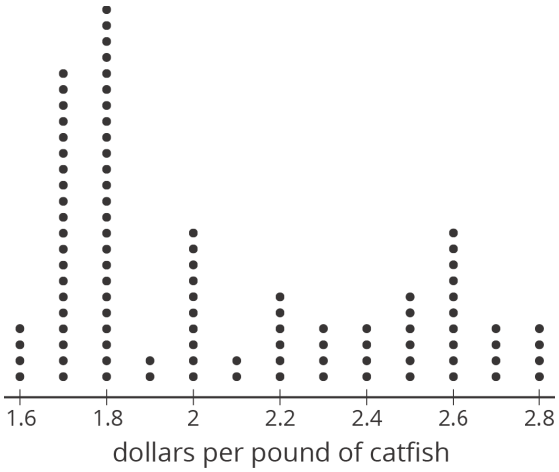
13.3: Sampling the Fish Market

m.openup.org/1/7-8-13-3

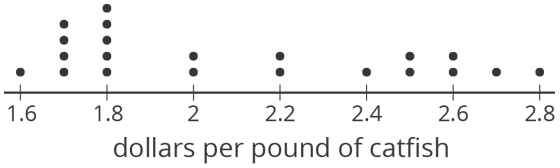
The price per pound of catfish at a fish market was recorded for 100 weeks.

1. Here are dot plots showing the population and three different samples from that population. What do you notice? What do you wonder?

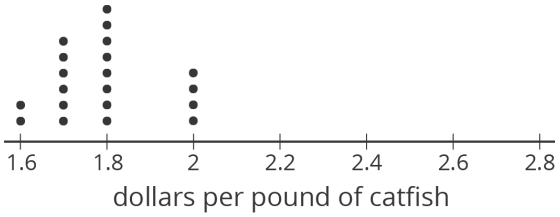
Population



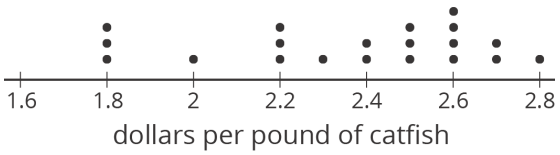
Sample 1



Sample 2



Sample 3



2. If the goal is to have the sample represent the population, which of the samples would work best? Which wouldn't work so well? Explain your reasoning.

NAME DATE PERIOD

Are you ready for more?

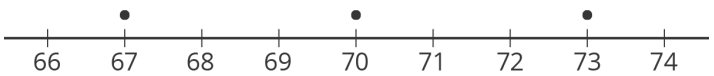
When doing a statistical study, it is important to keep the goal of the study in mind. Representative samples give us the best information about the distribution of the population as a whole, but sometimes a representative sample won't work for the goal of a study!

For example, suppose you want to study how discrimination affects people in your town. Surveying a representative sample of people in your town would give information about how the population generally feels, but might miss some smaller groups. Describe a way you might choose a sample of people to address this question.

13.4: Auditing Sales

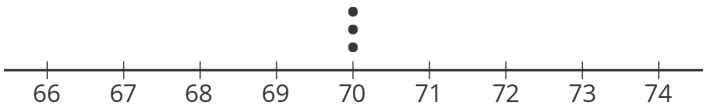
An online shopping company tracks how many items they sell in different categories during each month for a year. Three different auditors each take samples from that data. Use the samples to draw dot plots of what the population data might look like for the furniture and electronics categories.

Auditor 1's sample



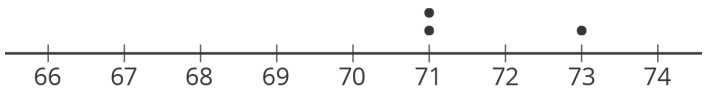
monthly sales of furniture online (in hundreds)

Auditor 2's sample



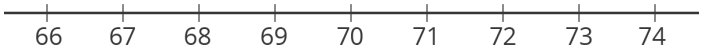
monthly sales of furniture online (in hundreds)

Auditor 3's sample



monthly sales of furniture online (in hundreds)

Population



monthly sales of furniture online (in hundreds)

NAME DATE PERIOD

Auditor 1's sample

Auditor 2's sample

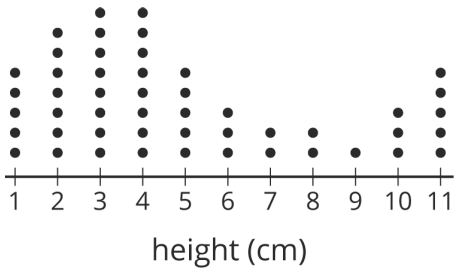
Auditor 3's sample

Population

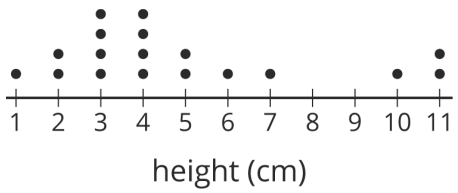
Lesson 13 Summary

A sample that is **representative** of a population has a distribution that closely resembles the distribution of the population in shape, center, and spread.

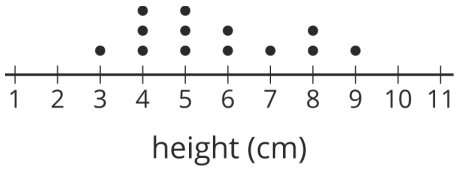
For example, consider the distribution of plant heights, in cm, for a population of plants shown in this dot plot. The mean for this population is 4.9 cm, and the MAD is 2.6 cm.



A representative sample of this population should have a larger peak on the left and a smaller one on the right, like this one. The mean for this sample is 4.9 cm, and the MAD is 2.3 cm.



Here is the distribution for another sample from the same population. This sample has a mean of 5.7 cm and a MAD of 1.5 cm. These are both very different from the population, and the distribution has a very different shape, so it is not a representative sample.



NAME DATE PERIOD

Lesson 13 Glossary Terms

- representative

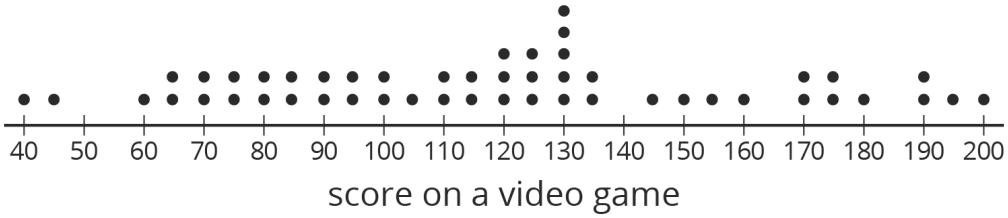
NAME DATE PERIOD

Unit 8, Lesson 13: What Makes a Good Sample?

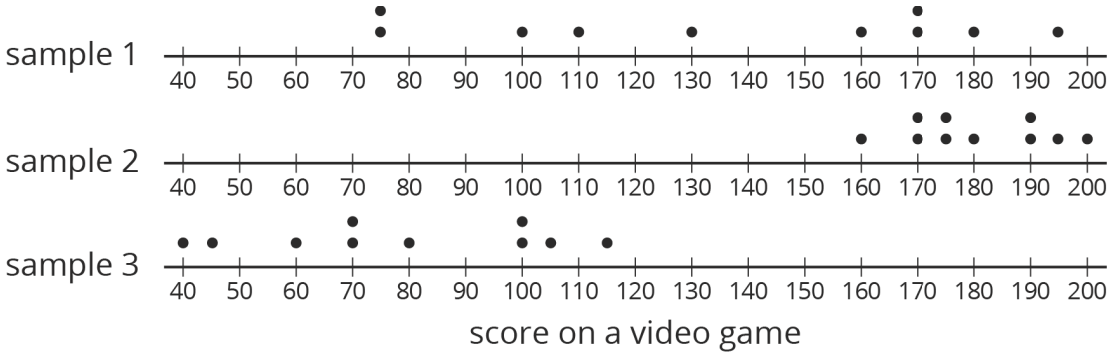
1. Suppose 45% of all the students at Andre's school brought in a can of food to contribute to a canned food drive. Andre picks a representative sample of 25 students from the school and determines the sample's percentage.

   He expects the percentage for this sample will be 45%. Do you agree? Explain your reasoning.

2. This is a dot plot of the scores on a video game for a population of 50 teenagers.

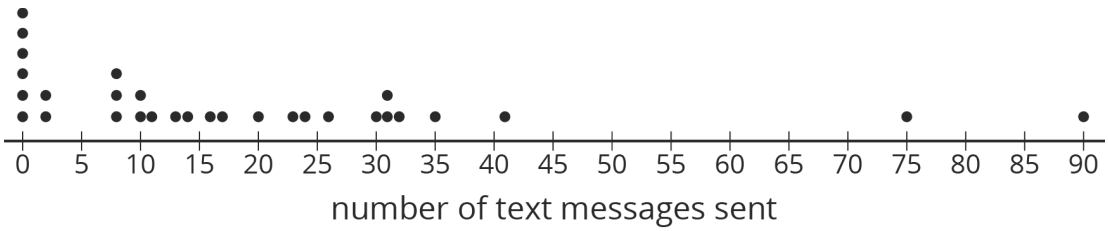


   The three dot plots together are the scores of teenagers in three samples from this population. Which of the three samples is most representative of the population? Explain how you know.



3. This is a dot plot of the number of text messages sent one day for a sample of the students at a local high school. The sample consisted of 30 students and was selected to be representative of the population.

NAME DATE PERIOD



a. What do the five values of 0 in the dot plot represent?

b. Since this sample is representative of the population, describe what you think a dot plot for the entire population might look like.

4. A doctor suspects you might have a certain strain of flu and wants to test your blood for the presence of markers for this strain of virus. Why would it be good for the doctor to take a sample of your blood rather than use the population?

(from Unit 8, Lesson 12)

5. How many different outcomes are in each sample space? Explain your reasoning.

(You do not need to write out the actual options, just provide the number and your reasoning.)

a. A letter of the English alphabet is followed by a digit from 0 to 9.

b. A baseball team's cap is selected from 3 different colors, 2 different clasps, and 4 different locations for the team logo. A decision is made to include or not to include reflective piping.

c. A locker combination like 7-23-11 uses three numbers, each from 1 to 40. Numbers can be used more than once, like 7-23-7.

(from Unit 8, Lesson 8)