

Name: *Key* Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
Population	All <del>into</del> data that falls into a category Example: People in the United States.
Sample	A small group within the population. Example: Students in Mr. Marshall's class
Unbiased sample	An unbiased sample is: <ul style="list-style-type: none"><li>• each item in a population is likely to be chosen</li><li>• population divided into similar, nonoverlapping groups</li><li>• items are selected according to a specific time or item interval</li></ul>
Biased sample	Not representative of the larger population
Examples	<b>Determine whether each sample is biased or unbiased. Explain.</b> 1. To estimate the number of students in your school who play a sport outside of school, you decide to survey the players on the boys' baseball team. <i>Biased, asking only people who play a sport</i> 2. Katy would like to approximate the number of students in her school that own a pet. She decides to survey five students in her homeroom. <i>Biased, not a large enough sample size</i> 3. The Yearbook Committee must choose among three different themes for this year's yearbook. To help make their decision, they survey 100 random students during lunch. <i>Unbiased, picked at a specific time</i> 4. The New England Patriots and the Atlanta Falcons played in the 51 <sup>st</sup> Super Bowl. To determine team was the favorite to win, a New York City newspaper surveyed 500 residents. <i>Biased, not representative of the population</i>

## Predicting Outcomes

The results of an **unbiased sample** are **proportional** to the results of a population. You can use unbiased sample results to **make predictions** about the population.

Biased sample results should not be used to make predictions about the population.

## Examples

5. Members of the Marching Band plan to sell cookie dough to raise money for new uniforms. They survey 60 students at random to determine their favorite type of cookie. The results are shown in the table below.

Flavor	Number
Chocolate Chip	21
Peanut Butter	12
Oatmeal Raisin	9
Sugar	18

- a) What percent of the students prefer sugar cookies?

$$\frac{18}{60} = \frac{P}{100} \quad P = 30\%$$

- b) What percent of the students prefer chocolate chip or peanut butter cookies?

$$\frac{33}{60} = \frac{P}{100} \quad P = 55\%$$

- c) If the band orders 500 tubs of cookie dough, how many tubs of sugar cookie dough should they order?

$$\frac{18}{60} = \frac{x}{500}$$

$$x = 125 \text{ tubs}$$

6. Seventy-five random 8<sup>th</sup> grade students were surveyed to see how many text messages they send each day. The results are shown in the table below.

Text Messages	Number
0-25	4
26-50	14
51-75	25
76 or more	32

- a) What percent of the students send 51-75 text messages each day?

$$\frac{25}{75} = \frac{P}{100} \quad P = 33.3\%$$

- b) What percent of the students send no more than 50 text messages each day?

$$\frac{19}{75} = \frac{P}{100} \quad P = 24\%$$

- c) If there are 450 total students in the 8<sup>th</sup> grade, how many would you expect to send at least 76 text messages a day?

$$\frac{32}{75} = \frac{x}{450}$$

$$x = 192 \text{ students}$$

7. A group of middle school students were randomly chosen and asked about whether they are going to attend the school carnival. Of these students, 65% said yes.

- a) If 52 students responded yes, how many students were surveyed?

$$\frac{52}{x} = \frac{65}{100}$$

$$x = 80 \text{ students}$$

- b) If there are 1600 students in the school, predict the number of students who will attend the carnival.

$$\frac{52}{80} = \frac{x}{1600} \quad x = 1040$$

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