

May 7, 2015 4th

Get out your homework



Only 50¢ per Star

5/7 Samples and Populations

A **population** is an entire group of people or objects. A **sample** is a part of the population. You can use a sample to make an *inference*, or conclusion, about a population.

Work with a partner. Identify the population and the sample.

a.



The students in a school



The students in a math class

b.



The grizzly bears with GPS collars in a park



The grizzly bears in a park

c.



150 quarters



All quarters in circulation

d.



All books in a library



10 fiction books in a library

When a sample is selected at random, each member of the population is equally likely to be selected.

In order to make inferences about a population, you must choose a random sample very carefully so that it accurately represents the population.

You want to know the favorite extracurricular activity of students at your school. Determine whether each method will result in a random sample. Explain.

You ask members of the school band.

You ask every 8th grade student who enters the school in the morning.

You ask all of the students in your current class.

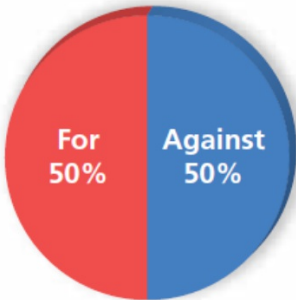
You publish a survey in the school newspaper.

Work with a partner. A new power plant is being built outside a town. In each situation below, residents of the town are asked how they feel about the new power plant. Determine whether each conclusion is valid. Explain your reasoning.

A local radio show takes calls from 500 residents. The table shows the results. The radio station concludes that most of the residents of the town oppose the new power plant.

New Power Plant	
For	70
Against	425
Don't know	5

New Power Plant



A news reporter randomly surveys 2 residents outside a supermarket. The graph shows the results. The reporter concludes that the residents of the town are evenly divided on the new power plant.

You randomly survey 250 residents at a shopping mall. The table shows the results. You conclude that there are about twice as many residents of the town against the new power plant than for the new power plant.

New Power Plant	
For	32%
Against	62%
Don't know	6%

An **unbiased sample** is representative of a population. It is selected at random and is large enough to provide accurate data.

A **biased sample** is not representative of a population. One or more parts of the population are favored over others.

You want to estimate the number of students in a high school who ride the school bus. Which sample is unbiased?

- (A) 4 students in the hallway
- (B) all students in the marching band
- (C) 50 seniors at random
- (D) 100 students at random during lunch



You want to estimate the number of eighth-grade students in your school who consider it relaxing to listen to music. You randomly survey 15 members of the band. Your friend surveys every fifth student whose name appears on an alphabetical list of eighth graders. Which sample is unbiased? Explain.



You want to know how the residents of your town feel about adding a new stop sign. Determine whether each conclusion is valid.



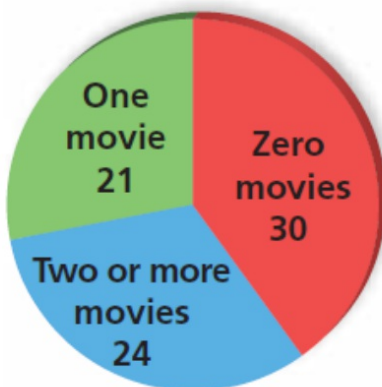
- a. You survey the 20 residents who live closest to the new sign. Fifteen support the sign, and five do not. So, you conclude that 75% of the residents of your town support the new sign.

- b. You survey 100 residents at random. Forty support the new sign, and sixty do not. So, you conclude that 40% of the residents of your town support the new sign.

The results of an unbiased sample are proportional to the results of the population. So, you can use unbiased samples to make predictions about the population.

You ask 75 randomly chosen students how many movies they watch each week. There are 1200 students in the school. Predict the number n of students in the school who watch one movie each week.

Movies per Week



$$\frac{21}{75} = \frac{n}{1200}$$

Sample population

$$\frac{75n}{75} = \frac{25200}{75}$$
$$n = 336$$

Homework

Yellow WS 8

Due Fri?