

**15.6**

**Samples &  
Populations**

# Do Now

You randomly choose one of the chips. Without replacing the first chip, you choose a second chip. Which question is different? Find “both” answers.

1. What is the probability of choosing a 1 and then a blue chip?

2. What is the probability of choosing a 1 and then an even number?

3. What is the probability of choosing a green chip and then a chip that is *not* red?

4. What is the probability of choosing a number less than 2 and then an even number?



# Learning Target:

- I can determine when samples are representative of populations.
- I can use data from random samples to make predictions about populations.

## Key Vocabulary & Idea:

### Independent Events

An entire group of \_\_\_\_\_ or \_\_\_\_\_.

### Sample

A \_\_\_\_\_ of the population

### Inference

To make a \_\_\_\_\_.

## Key Vocabulary & Idea:

### Unbiased Sample

A representation of a population that is selected at \_\_\_\_\_ and large enough to provide \_\_\_\_\_ data.

### Biased Sample

A sample that is \_\_\_\_\_ of a population that is selected. \_\_\_\_\_ or \_\_\_\_\_ parts of the population are \_\_\_\_\_ over \_\_\_\_\_ .

# Identifying an Unbiased Sample

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



# Practice

- 1) What if you want to estimate the number of seniors in high school who rider the school bus. Which sample is unbiased? Explain.
- 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



- 2) 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.

## **Key Vocabulary & Idea:**

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

biased samples are not \_\_\_\_\_ of the population. So, you should \_\_\_\_\_ use them to make \_\_\_\_\_ about the population because the predictions may not be \_\_\_\_\_.

# Determining Whether Conclusions are Valid

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.



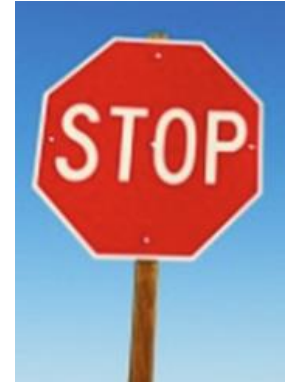
b) You survey 100 residents at random. Forty support the new sign, and sixty do not. So, you conclude that 40% of the residents of your town support the new sign.



# Determining Whether Conclusions are Valid

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.

# Practice

- 3) Each of 25 randomly chosen firefighters supports the new sign. So, you conclude that 100% of the residents of your town support the new sign. Is the conclusion valid? Explain.

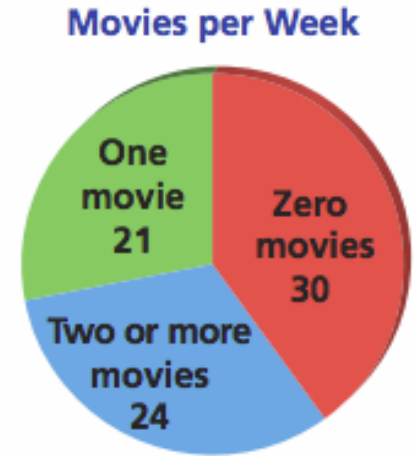
# Making Predictions

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.

Is the sample unbiased? How do you know? If yes, then you can use it to make a prediction.

Sample

Population



- 4) Predict the number of students in the school who watch two or more movies each week.