15.6

Samples and Populations

Do Now

1. **Describe two possible ways to find the total number of possible outcomes of spinning the spinner and rolling the number cube.**

2. **Give a real-life example of a compound event.**

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:

Population

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.

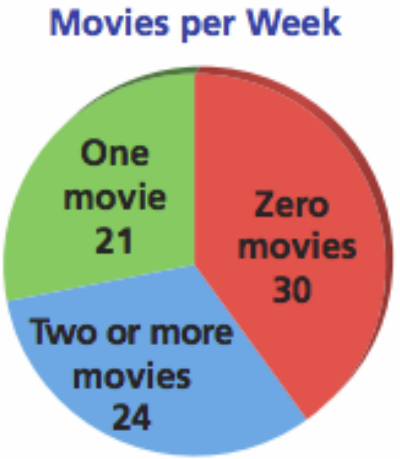
a) You survey the 20 residents who live closest to the new sign. Fifteen support the sign, and five do not. So, you conclude that 75% of the residents of your town support the new sign.

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.

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.