

Lesson 2 Reteach

Unbiased and Biased Samples

Data gathered from a representative sample can be used to make predictions about a population. An **unbiased sample** is selected so that it is representative of the entire population. In a **biased sample**, one or more parts of the population are favored over others.

Examples

Determine whether each sample is valid. Justify your answer.

1. To determine the favorite dog breed of people who enter dog shows, every fifth person entering a dog show is surveyed.

Since the people are selected according to a specific pattern, the sample is a systematic random sample. It is a valid unbiased sample.

2. To determine what type of pet people prefer, the spectators at a dog show are surveyed.

The spectators at a dog show probably prefer dogs. This is a biased sample that is not valid. The sample is a convenience sample since the people surveyed are in one location.

Examples

COOKIES Students in the eighth grade surveyed 50 students at random about their favorite cookies. The results are in the table at the right.

Flavor	Number
Oatmeal	15
Peanut butter	11
Chocolate chip	16
Sugar	8

3. What percent of students prefer chocolate chip cookies?

16 out of 50 students prefer chocolate chip cookies.

$$16 \div 50 = 0.32$$

32% of the students prefer chocolate chip cookies.

4. If the students order 500 boxes of cookie dough, how many boxes should be chocolate chip?

Find 32% of 500.

$$0.32 \times 500 = 160$$

About 160 boxes of cookie dough should be chocolate chip.

Exercises

Determine whether each sample is valid. Justify your answer.

1. To determine if the tomatoes in 5 boxes stacked on a pallet are not spoiled, the restaurant manager checks 3 tomatoes from the top box.

A random survey of the students in eighth grade shows that 7 prefer hamburgers, 5 prefer chicken, and 3 prefer hot dogs.

2. Is the sample valid? What percent prefer hot dogs?
3. If 120 students will attend the eighth grade picnic, how many hot dogs should be ordered for each student to get one?

Lesson 2 Skills Practice

Unbiased and Biased Samples

Determine whether each conclusion is valid. Justify your answer.

1. To evaluate the defect rate of its memory chips, an integrated circuit manufacturer tests every 100th chip off the production line. Out of 10 chips tested, one chip is found to be defective. The manufacturer concludes that 3 chips out of 3,000 will be defective.
2. Students who wish to represent the school at a school board meeting are asked to stop by the office after lunch. After lunch, 5 students wish to represent the school.
3. To determine if the class understood the homework assignment, the math teacher checks the top 3 papers in the pile of collected homework. The teacher finds that all students understood the homework assignment.
4. A member of the cafeteria staff asks every fifth student leaving the cafeteria to rank 5 vegetables from most favorite to least favorite. She finds that corn is one of the favorite vegetables.
5. One bead for every member of the school orchestra is placed in a bag. All but 2 of the beads are white. Each member draws a bead from the bag, and the members who pick the non-white beads will represent the orchestra. It is predicted that two different instrument players will choose the white beads.
6. A real estate agent surveys people about their housing preferences at an open house for a luxury townhouse. He finds that most people prefer townhomes.
7. To determine the most popular children's programs, a television station asks parents to call in and complete a phone survey. The television station finds that the children's programs that are animated are the most popular.