

Mid-Chapter Quiz: Lessons 11-1 through 11-3

Determine whether each situation describes a survey, an experiment, or an observational study. Then identify the sample, and suggest a population from which it may have been selected.

1. A high school principal wants to test five ideas for a new school mascot. He randomly selects 15 high school students to view pictures of the ideas while he watches and records their reactions.

ANSWER:

observational study; sample: the 15 high school students selected; population: the student body

2. Half of the employees of a grocery store are randomly chosen for an extra hour lunch break. The managers then compare their attitudes with their co-workers.

ANSWER:

experiment; sample: the employees that were given an extra hour lunch break; population: all grocery store employees

3. Students want to create a school yearbook. They send out a questionnaire to 100 students asking what they would like to showcase in the yearbook.

ANSWER:

survey; sample: the 100 students who received the questionnaire; population: school body

4. The producers of a sitcom want to determine if a new character that they are planning to introduce will be well received. They show a clip of the show with the new character to 50 randomly chosen participants and then record the participants' reactions.

ANSWER:

observational study; sample: the 50 participants; population: all potential viewers

5. **MULTIPLE CHOICE** Which survey question is unbiased?
 - A Do you like days like today?
 - B Which is your favorite theme park, Park A or Park B?
 - C Don't you think that carrots taste better than celery?
 - D How often do you go to the movies?

ANSWER:

D

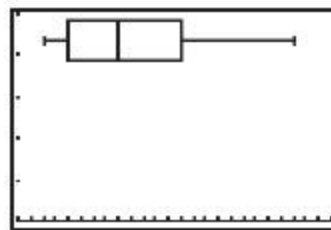
6. **PARENTS** The table below shows the ages of parents who volunteered to assist in a neighborhood bake sale.

Ages of Parents (years)				
28	34	33	45	31
33	41	34	36	42
30	29	32	40	36
29	33	29	28	44
47	31	28	27	29

- a. Use a graphing calculator to create a box-and-whisker plot. Then describe the shape of the distribution.
- b. Describe the center and spread of the data using either the mean and standard deviation or the five-number summary. Justify your choice.

ANSWER:

a.



[25, 50] scl: 1 by [0, 5] scl: 1

positively skewed

- b. Sample answer: The distribution is skewed, so use the five-number summary. The ages range from 27 to 47 years. The median is 33 years, and half of the data are between 29 and 38 years.

7. **TRAINING** Aiden and Mark's training times for the 40-meter dash are shown.

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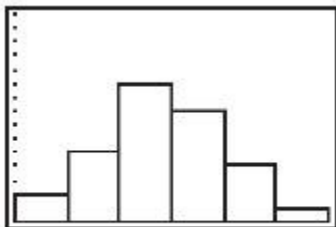
Aiden's 40-Meter Dash Times (seconds)					
4.84	4.94	4.87	4.78	5.04	4.98
4.83	5.03	4.74	5.15	4.82	4.91
4.62	4.83	4.76	4.93	4.85	4.82
4.76	4.98	4.94	5.05	4.94	5.04
4.86	4.85	4.71	4.66	4.91	4.82

Mark's 40-Meter Dash Times (seconds)					
5.03	4.76	4.69	4.52	4.81	4.78
4.65	4.66	4.83	4.95	4.64	4.76
4.43	4.64	4.50	4.58	4.68	4.65
4.83	4.78	4.71	4.81	4.76	4.84
4.61	4.63	4.33	4.46	4.74	4.63

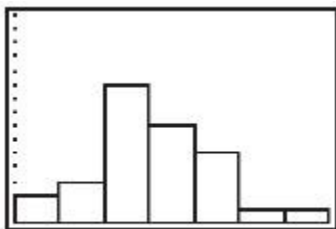
- a. Use a graphing calculator to create a histogram for each data set. Then describe the shape of each distribution.
- b. Compare the distributions using either the means and standard deviations or the five-number summaries. Justify your choice.

ANSWER:

a.



[4.6, 5.2] scl: 0.1 by [0, 15] scl: 1



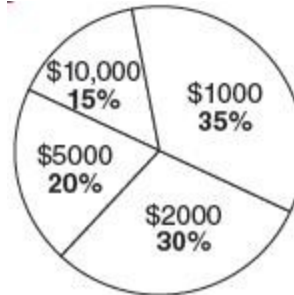
[4.4, 5.1] scl: 0.1 by [0, 15] scl: 1

both symmetric

- b. Sample answer: The distributions are symmetric, so use the means and standard deviations. The mean time for Aiden is about 4.88 with standard deviation of about 0.12. The mean time for Mark is about 4.69

with standard deviation of about 0.15. We can conclude that Aiden's times were higher than Mark's and the variation of Mark's times from the mean is greater than Aiden's.

8. **MULTIPLE CHOICE** Find the expected value of winning one of the following prizes.



- F \$1950
G \$2100
H \$3000
J \$3450

ANSWER:

J

Identify the random variable in each distribution, and classify it as discrete or continuous. Explain your reasoning.

9. the number of calls received by an operator

ANSWER:

The random variable X is the number of calls. The calls are countable, so X is discrete.

10. the number of books sold at a yard sale

ANSWER:

The random variable X is the number of books sold. The books are countable, so X is discrete.

11. the height of students in a gym class

ANSWER:

The random variable X is the height of students in gym class. Height can be anywhere within a certain range. Therefore, X is continuous.

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12. the weight of animals on a farm

ANSWER:

The random variable X is the weight of the animals.

Weight can be anywhere within a certain range.

Therefore, X is continuous.