Questions on lesson 2.1?

We will be having our concept
mastery quiz shortly.

2.2

Circle Up
Sampling Methods and Randomization

PG. 57-8 IN YOUR BOOK

PROBLEM 1 You Gotta Mix It Up

When you use statistics, you are often measuring the values of a population by focusing on the measurements of a sample of that population. A population does not have to refer to people. It can be any complete group of data—like the areas of 100 circles.

The end of this lesson includes 100 circles and a table. The table lists an identification number, the diameter, and the area for each circle. Suppose you want to determine the mean area of all 100 circles. Calculating the areas of all of the circles would be time-consuming. Instead, you can use different samples of this population of circles to estimate the mean area of the entire population.

1. Without looking at the circles, Mauricia decided to use Circles 1–5 for her sample. Is it likely that those 5 circle areas are representative of all 100 circles? Explain your reasoning.

   Not representative of all 100 circles. Most likely, the first 5 won't include a variety of sizes.

2. Analyze the circles. Select a sample of 5 circles that you think best represents the entire set of circles.

Sep 14-9:36 AM

2

PG.58 IN YOUR BOOK

A **convenience sample** is a sample whose data is based on what is convenient for the person choosing the sample.

The sample of circles you chose in Question 2 is called a *subjective sample*. A **subjective sample** is a sample drawn by making a judgment about which data items to select.

Another type of sample is a *volunteer sample*. A **volunteer sample** is a sample whose data consists of those who volunteer to be part of a sample.

PG.60 IN YOUR BOOK

A **simple random sample** is a sample composed of data elements that were equally likely to have been chosen from the population.

1. Explain how convenience samples, subjective samples, and volunteer samples do not include data elements that were equally likely to have been chosen from the population.

Using a random digit table is one option for selecting a simple random sample. To use the table, begin at any digit and follow the numbers in a systematic way, such as moving across a row until it ends and then moving to the beginning of the next row.

Random Digit Table									
Line 1	65285	97198	12138	53010	94601	15838	16905	61004	43516	17020
Line 2	17264	57327	38224	29301	31381	38109	34976	65692	98566	29550
Line 3	95639	99754	31199	92558	68368	04985	51092	37780	40261	14479
Line 4	61555	76404	86210	11808	12841	45147	97438	60022	12645	62006
Line 5	78137	98768	04689	87130	79225	08153	84967	64539	79493	74917
Line 6	62490	99215	84987	28759	19177	14733	24550	28067	68894	38490
Line 7	24216	63444	21283	07044	92729	37284	13211	37485	10415	36457
Line 8	16975	95428	33226	55903	31605	43817	22250	03918	46999	98504
Line 9	59138	39542	71168	57609	91510	77904	74244	50940	31553	62562
Line 10	29478	59652	50414	31966	87912	87154	12944	49862	96566	48825
Line 11	96155	95009	27429	72918	08457	78134	48407	26061	58754	05326
Line 12	29621	66583	62966	12468	20245	14015	04014	35713	03980	03024
Line 13	12639	75291	71020	17265	41598	64074	64629	63293	53307	48766
Line 14	14544	37134	54714	02401	63228	26831	19386	15457	17999	18306
Line 15	83403	88827	09834	11333	68431	31706	26652	04711	34593	22561
Line 16	67642	05204	30697	44806	96989	68403	85621	45556	35434	09532
Line 17	64041	99011	14610	40273	09482	62864	01573	82274	81446	32477
Line 18	17048	94523	97444	59904	16936	39384	97551	09620	63932	03091
Line 19	93039	89416	52795	10631	09728	68202	20963	02477	55494	39563
Line 20	82244	34392	96607	17220	51984	10753	76272	50985	97593	34320

(handwritten) Circle #

	Circle #
1	79
2	22
3	50
4	81
5	53

PG.61 IN YOUR BOOK

Take 5 mins to work on page 61

You can also use a graphing calculator to generate a random list of numbers.

> You can use a graphing calculator to generate a random list of numbers and select a simple random sample of 5 circles.
>
> **Step 1:** Press **MATH**.
>   Scroll to the **PRB** menu.
>   Select **5:randInt(**
>
> **Step 2:** Enter a lower bound for the random number, an upper bound for the random number, and how many random numbers to generate. Use commas between values as you enter them.
>
> **Step 3:** Press **ENTER**.

(note) The lower bound is 0, the upper bound is 99, and the number of random numbers to generate is 5.

Sep 14-9:39 AM

PG.62 IN YOUR BOOK

There are several other types of random samples, including *stratified random samples, cluster samples*, and *systematic samples*.

A **stratified random sample** is a random sample obtained by dividing a population into different groups, or strata, according to a characteristic and randomly selecting data from each group.

*circle size - S, M, L

PG.63 IN YOUR BOOK

A **cluster sample** is a random sample that is obtained by creating *clusters*. Then, one cluster is randomly selected for the sample. Each **cluster** contains the characteristics of a population.

*group by space on page

A **systematic sample** is a random sample obtained by selecting every *n*th data value in a population.

*every 3rd circle

PG.65 IN YOUR BOOK

The mean of a sample, $\bar{x}$, can be used to estimate the population mean, μ. The population mean is an example of a parameter, because it is a value that refers to a population. The sample mean is an example of a statistic, because it is a value that refers to a sample.

NOT IN YOUR BOOK

1. Twenty-four professional athletes are participating in a charity golf tournament. Each golfer has been given an identification number from 01 through 24. Golfers 01 through 12 are professional football players and golfers 13 through 24 are professional baseball players. Par for the course is 72. The following table shows the golfers' tournament scores after the first round.

Golfer ID Number	Score	Golfer ID Number	Score
01	72	13	79
02	75	14	85
03	69	15	67
04	78	16	75
05	80	17	68
06	68	18	76
07	81	19	68
08	72	20	69
09	74	21	71
10	77	22	76
11	75	23	70
12	77	24	74

   a. Create a simple random sample of 6 scores from the table. Explain how you created your sample.

   randInt(1,24,6)

   b. Calculate the average of your sample from part (a).

   c. Create a stratified random sample of 6 scores from the table. Explain how you created this sample.

   d. Calculate the average of your sample from part (c).

   e. Create a cluster sample of 6 scores from the table. Explain how you created this sample.

   f. Calculate the average of your sample from part (e).

   g. Create a systematic sample of 6 scores from the table. Explain how you created this sample.

   h. Calculate the average of your sample from part (g).

i. The actual average score is 74. Which of your sample averages was closest to the actual average? Is this what you expected? Explain.

Homework

Finish lesson 2.2 through pg. 65