

3.1 – Statistics Vocabulary and Measures of Central Tendency

- Statistics contains A LOT of vocabulary so below are some words that you NEED TO KNOW:
 - **statistics** → the art and science of extracting meaning from _____
 - **census** → acquiring data from an _____
 - **sampling** → polling a _____ which is intended to show what the whole is like
 - **random sampling:** every possible sample has an _____ of being selected (IDEAL)
 - **systematic sampling:** a random sample that is chosen through a specific _____
 - **stratified sampling:** a random sample from a _____ to obtain a particular type of a population
 - **multi-stage sampling:** a random sample from _____ of a population
 - **biased sampling:** some possible samples may have a _____ for a specific outcome
 - **voluntary sampling:** possible samples _____ whether or not they will participate
 - **convenience sampling:** most possible samples are selected because they're _____
 - **variable** → the data collected on each _____ and is broken up into two different types
 - **categorical (variable):** a variable that is assigned a _____ of each subject or group
 - **quantitative (variable):** a variable that is assigned a _____ of each subject or group
 - **sample design** → the choice and specifics of _____ a researcher will _____
 - **observation:** the researcher watches responses and tries to avoid _____ the subjects
 - **survey:** the researcher pose _____ and record the subject's _____
 - **experiment:** the researcher intentionally imposes a _____ upon the subjects;
contains a control group (placebo group) and a treatment group or double-blind group
 - **simulation:** the researcher uses a _____ and _____ to examine outcomes

Example 1: Random samples are ideal. Determine if each method produces a true random sample.

- asking every tenth person coming out of a health club how many times a week they exercise
- surveying people going into an Italian restaurant to find out people's favorite type of food
- the government sending a tax survey to everyone whose social security number ends in a particular digit
- surveying students in a honors chemistry classes to determine the average time students study each week
- putting names of all seniors in a hat, then drawing names from the hat to select a sample of seniors
- selecting a student from 200 by picking the fifth student then every tenth student after that
- selecting a resident of the United States to take survey by choosing a State, then a county, and a city

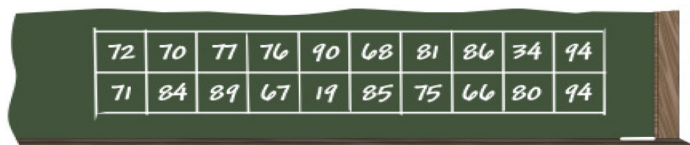
Example 2: Determine what type of sample design is being described.

- A teacher wants to make sure a pair of dice are fair (one side is not weighted more) by rolling them 1000 times.
- A doctor is monitoring a patient after they have administered an injection to see if patient has a reaction.
- A manufacturer asks random people in a town what products they would like to see sold in the area.
- A fitness instructor gives out a herbal supplement to her students to see if it enhances their performance.

- A huge part of collecting data and interpreting it is finding the measures of central tendency:
- **measures of central tendency** → represents the _____ of a set of data
 - mean – the _____ divided by the _____
 - a common notation for mean is _____ (often called “_____”)
 - it can also be written in this form _____
 - median – after arranging the numbers from _____, it represents the _____
 - if there are an _____ number of numbers then take the middle number
 - if there are an _____ number of numbers then take the average of two middle numbers
 - mode – represents the number that _____
 - if no number occurs more often than any other, then the data is _____
 - if there are two numbers that occur that same number of times, then the data is _____

Example 3: Find the measures of central tendency and answer its questions for each problem.

a.) Below are Mr. Dent’s Algebra 2 exam scores:



72	70	71	76	90	68	81	86	34	94
71	84	89	67	19	85	75	66	80	94

i.) mean = _____ median = _____ mode = _____

ii.) Mr. Dent’s students asked how they did on their exam. What measure of central tendency would best answer their question? _____

b.) Use the stem-leaf plot below:

Stem	Leaf
4	4 5 6 7 7
5	3 5 6 7 8 9
6	7 7 8 9 9 9

i.) mean = _____ median = _____ mode = _____

ii.) Why is having the data setup like this helpful?

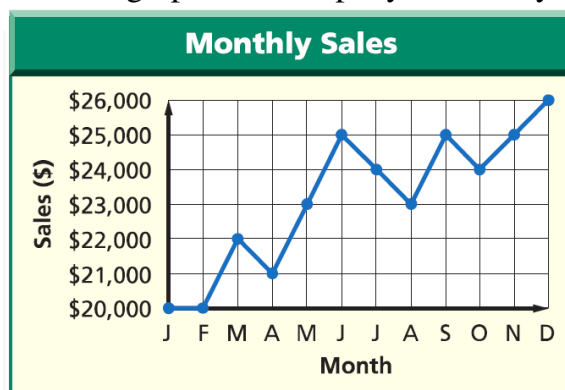
c.) The table below lists the areas of some large shopping malls in the United States:

	Mall	Gross Leasable Area (ft ²)
1	Del Amo Fashion Center, Torrance, CA	3,000,000
2	South Coast Plaza/Crystal Court, Costa Mesa, CA	2,918,236
3	Mall of America, Bloomington, MN	2,472,500
4	Lakewood Center Mall, Lakewood, CA	2,390,000
5	Roosevelt Field Mall, Garden City, NY	2,300,000
6	Gurnee Mills, Gurnee, IL	2,200,000
7	The Galleria, Houston, TX	2,100,000
8	Randall Park Mall, North Randall, OH	2,097,416
9	Oakbrook Shopping Center, Oak Brook, IL	2,006,688
10	Sawgrass Mills, Sunrise, FL	2,000,000
10	The Woodlands Mall, The Woodlands, TX	2,000,000
10	Woodfield, Schaumburg, IL	2,000,000

i.) mean = _____ median = _____ mode = _____

ii.) You are a realtor who is trying to lease mall space in different areas of the country to a large retailer. Which measure would you talk about if the customer felt that the malls were too large for his store?

d.) Below is graph of a company’s monthly sales:



i.) mean = _____ median = _____ mode = _____

ii.) What are two types of situations that this graph could be used for?

