DEFINITION Quantitative (aka numerical) data consist of <u>Numbers</u> counts or _ measurements representing Categorical (aka qualitative or attribute) data consist of ______ labolo _ that are not numbers representing counts or measurements. Give 2 examples of a. Quantitative data tow many people like a certain type of muoic. Distance you drive to school. b. Categorical data Gonce of Music upe of milk (nonfat, 1%, etc) DEFINITION e Discrete data result when the number of possible values is either a ____ number or a rountable number. Continuous (aka numerical) data result from many possible values that CONTINUOUS correspond to some _ ___ scale that covers a __ of values without gaps, interruptions or jumps. Give 2 examples of a. Discrete data # of bananao in a bunch # of fruit loops in a box of careal b. Continuous data U.S. Deficit 105 10,99C

TED BY SHANNON MARTIN GRACEY

DEFINITION

The nominal level of measurement is characterized by data that consists of				
names	labelo	, or _	categories	_ only. The data cannot
be arranged in an _	ordering	scheme	(such as low to high).	

Give 2 examples of the nominal level of measurement.

(3) gender cereal brands or types people's names

DEFINITION

Data are at the ordinal leve	I of measurement if they can be _	arranged	in some
order	, but differences (obtained by sub	V otraction) between data	values either
cannot be determined or are meaningless.			

Give 2 examples of the ordinal level of measurement.

bar codes

hone t's

SSN

DEFINITION

The interval level of measurement is like the	Ievel, with the additional
property that the <u>difference</u> between	een any two data values is meaningful. However,
data at this level do not have a natural <u>7200</u> present).	starting point (where none of the quantity is

Give 2 examples of the interval level of measurement.

(2) List prices of houses lemperature.

STATISTICS GUIDED NOTEBOOK/FOR USE WITH MARIO TRIOLA'S TEXTBOOK ESSENTIALS OF STATISTICS, 3RD ED.

DEFINITION
The ratio level of measurement is like the interval level, with the additional
property that there is a natural <u>Zero</u> starting place (where zero indicates that
none of the quantity is present). For values at this level,
<u>catios</u> are both meaningful.

Give 2 examples of the ratio level of measurement.

1) Superbow | scores) Salaries of MC students

1.4 CRITICAL THINKING

"Lies, damned lies, and statistics" is a phrase describing the persuasive power of numbers, particularly the use of <u>statistics</u> to bolster weak <u>arguments</u>, and the tendency of people to disparage statistics that do not support their positions. It is also sometimes colloquially used to doubt statistics used to prove an opponent's point.

DEFINITION

A <u>voluntary r</u>	esponse sample (aka self	-select sample) is one in which	respondents
themselves	decide	_whether to be included.	

Give two examples of voluntary response samples.

Mail-in surveys
Web surveys
elections (presidential)

STATISTICS GUIDED NOTEBOOK/FOR USE WITH MARIO TRIOLA'S TEXTBOOK ESSENTIALS OF STATISTICS, 3RD ED.

CORRELATION AND CAUSALITY Another way to MISINTER DIE ______ statistical data is to find a statistical (and <association between two variables and to conclude that one of the variables _ (or directly affects) the other variable. DOES NOT IMPLY CAUSALITY! REPORTED RESULTS When collecting data from people, it is better to take the measurements _____OVV instead of asking subjects to _____ ____ results. Give two situations in which people might falsely report results. 1) Sexual preference 2) Income 3) weig SMALL SAMPLES not be based on samples that are far too small. Conclusions should PERCENTAGES or unclear Some studies will cite <u>Misleading</u> percentages. Keep in mind that 100% of a quantity is <u>AU</u> of the quantity. If there are references made to percentages which exceed 100%, such references are often not justified. PERCENTAGE REVIEW "of" means ______ hundred so $n\% = \frac{n}{100}$ Percent means per ____

Percentage of: Change the % to $\frac{1}{100}$ then multiply.

Fraction to percentage: Change the fraction to a decimal by dividing the

Merator by the denominator , then multiply by 100 and

put in the percent symbol.

Decimal to percentage: Multiply the decimal by ______ and put in the percent symbol.

Example 4: Perform the indicated operation.



b. Write 5/8 as a percentage.

$\frac{5}{8} = 0.625$	-> 0.625 · 100%
-	= 62.5%

c. Write 8.5% as a decimal

$$\rightarrow \frac{8.5}{100} = 0.085$$

d. Write 15% as a simplified fraction

$$152 = \frac{15 + 5}{100 + 5} = \frac{3}{20}$$

8.5%

LOADED QUESTIONS

If survey questions are not worded o	arefully, the resu	Its of a study can be misle	ading. Survey questions
can be <u>loaded</u>	_ or intentionally _	worded	to elicit a desired
response.			

ORDER OF QUESTIONS

Sometimes survey questions are unintentionally loaded by such factors as the $_$	order	of
items being considered.		

NONRESPONSE

A <u>NONESOUSE</u> occurs when someone either refuses to respond or is unavailable. Why do you think that more and more people are refusing to participate in polls?

Inconvenient, privacy issues, telemarketers

CREATED BY SHANNON MARTIN GRACEY

MISSING DATA

Results can sometimes be dramatically affected by missing data. This can be due to a			
occurrence such as a subject	of a study for reasons unrelated to the		
be less likely to report their income.			

SELF-INTEREST STUDY

Some parties with interests to _	promote	will sponsor studies. We should be wary of
surveys in which the sponsor can	enjoy monetary gains	from the results.

PRECISE NUMBERS

Numbers which are	estimates	should be rounded. 2,234,786 should be rounded to 2 million.
-------------------	-----------	--

DELIBERATE DISTORTIONS

http://jezebel.com/5730719/the-depressing-realities-of-rape-statistics

1.5 COLLECTI NG SAMPLE DATA

If sample data are not collected in the appropriate way, the data may be so completely useless that no amount of statistical torturing can salvage them.

DEFINITION

In an observational study , we Observational	_ and measure specific
characteristics, but we don't attempt to <u>modify</u>	the subjects being studied.
In an experiment, we apply some <u>Weatment</u>	and then proceed to
Observe its effects are called experimental units.	on the subjects. Subjects in experiments

Give one example of an

a. Observational study Collecting data on	b. Experiment Giving subjects different types of
subjects 'sleep parferns. DEFINITION	Offee to see which one helps people stay awake better.
In a <u>random sample</u> , members from the <u>popula</u> each <u>individual</u> member in the po of being selected. A <u>probability sample</u> involves selecting members fr	are selected in such a way that opulation has an <u>equal</u> chance from a <u>population</u> in such a way that
each member of the population has a <u>Know</u> being selected.	U (but not necessarily the same) chance of
DEFINITION	
A <u>simple random sample</u> of <i>n</i> subjects is selected in such a way that every possible <u>Sample</u> of the <u>size</u> size <u>h</u> has the same chance of being chosen.	
Random sample versus simple random sample Example: Consider a box with 100 marbles.	
Random Sample: Reach in and select marble. Each marble has the <u>Same</u> chance of being selected.	
Simple Random Sample: Reach in and select marbles many <u>fines</u> you do this, every possible gr being selected. If you then try selecting groups of possible group of 17 marbles has an equal chance of	s in <u>groups</u> of 6 (n = 6). No matter how roup of six marbles has the <u>sams</u> chance of 17 (n = 17) marbles, you will also find that every being selected.
Random, but not Simple Random: For the President voting precincts in your state, then interview all th	al Election, let's say you select a random sample of all e voters as they leave the polling place. The sample is
random because all voters	have an equal chance of being selected. The

sample is not simple random, because those _______ from precincts that were not selected have no chance of being interviewed. This is also known as a Cluster Sample.

There is no such thing as a sample that is "Simple Random, but not Random" because n can also equal a

sample of size 1.

Read more:

http://wiki.answers.com/Q/What_is_the_difference_between_a_random_sample_and_a_simple_rando m_sample#ixz21Z1axK9m

DEFINITION

In <u>systematic sampling</u> , we select some <u>Starting</u> point and then select every k th (such as every 20 th) element in the population.
With convenience sampling , we simply use results that are very <u><u>easy</u></u> to get.
With <u>stratified sampling</u> , we <u>Subdivide</u> the population into at least two different subgroups (aka strata) so that subjects within the same subgroup share the same characteristics, such
as <u>gender</u> or <u>oge</u> bracket, then we draw a sample from each <u>Subgroup</u> .
In <u>cluster sampling</u> , we first 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0
<u>cluoters</u> , then <u>randomly</u> select some of those clusters, and
then choose the members from those selected clusters.

Example 5: I dentify which type of sampling is used: random, systematic, convenience, stratified, or cluster.

- a. Every 8th driver is stopped and interviewed at a sobriety checkpoint.
- b. In a neighborhood, specific streets are randomly selected and all residents on the selected streets are polled.