Population: entire group that you are wanting to collect data on/about

Sample: part of population that you actually collect data on

Parameter: numerical value that describes population

Statistic: numerical value that describes the sample

Sample Survey: survey a sample of the population

Census: survey the whole population

Simple Random Sample: every member of the population has an = chance of being selected (using random digit table, putting names in a hat, etc.)

Voluntary Response Sample: sample chooses itself (online survey, call-in survey)

Convenience sample: sample is most convenient (sampling in 1 class period, asking the first 10 people)

Stratified Samples: population is broken into strata/subgroups based on common characteristic & sample picked randomly within each strata (9th/10th/11th/12th & pick 20 from each grade)

Systematic Sample: sample that is picked systematically (every 5th person)

Bias: occurs when a certain outcome is systematically favored
→ wording of questions
→ sampling method

Please have all 3 worksheets done by 9:20. We will review them in this order:

5.1 - Types of Samples

Populations and Samples Review

Population and Sample Practice

Statistical Reasoning Name: _____
5.1 – Types of Samples

Determine whether the following represent a simple random sample, a voluntary response sample, or a convenience sample.

1) Student organization looking to get signatures for a petition camp out in front of Class of 1950 Lecture Hall.

convenience sample

2) Select three students from a class to receive ice cream by putting all the students' names in a hat and picking out three names randomly.

simple random sample

3) In Fall 1995, the BBC in Britain requested viewers to call the network and indicate their favorite poem.

voluntary response sample

4) To get reactions about a particular new car, readers of a car magazine were asked to mail in their answers to a survey.

voluntary response sample

5) Selecting the first six students to arrive at class.

convenience sample

6) Subscribers to the magazine Sound Alive were assigned numbers. Then a sample of 30 subscribers was selected by using a random-number table. The subscribers in the sample were invited to rate new headphones for a "What do Subscribers Think" column.

simple random sample

7) A town council randomly selects phone numbers from a town directory to survey citizens' opinions on a new park.

simple random sample

8) Which question is unbiased?

a. Does the school board have the right to enforce a dress code?

b. Do you think the mayor is doing a good job in spite of his questionable character?

c. Do you prefer daytime or evening television programming?

d. Do you think the government should be allowed to cut down trees willy-nilly to build a new highway?

9) Which question is biased?

a. Do you prefer daytime or evening television programing?

b. Should there be a school dress code?

c. Do you prefer news or mindless sitcoms?

d. Do you think a new highway should be built?

Statistical Reasoning **Name:**

Populations and Samples Review

➢ **Population and Sample, Parameter and Statistic**

1. You are interested in the proportion of Stat 113 students that will end up with an A this semester. You survey 20 students enrolled in Stat 113. Identify the
   (a) population: all students enrolled in Stat 113
   (b) sample: 20 students enrolled in Stat 113
   (c) variable: proportion that get an A

2. The mean income of all subscribers to a particular magazine is **$26000**. We draw a random sample of 100 subscribers and find that their mean income is **$27300**. Identify the
   (a) population: all subscribers to magazine
   (b) sample: 100 subscribers to magazine
   (c) parameter: mean income of $26000
   (d) statistic: mean income of $27300

3. The average GPA for all female volleyball players in a particular college is **2.8**, and their mean height is **182cm**. Identify the parameter or statistic if there is any.
   mean height of 182 cm - parameter
   average GPA of 2.8 - parameter

➢ **Types of Sampling**

4. Which sampling method was utilized? Why?

(a) Student organization looking to get signatures for a petition camp out in front of Class of 1950 Lecture Hall.
convenience sample

(b) Select three students from a class to receive ice cream by putting all the students' names in a hat and picking out three names randomly.
simple random sample

(c) Select three female students and three male students to receive ice cream by putting all the men's names in one hat and all the women's names in a different hat and picking out three names from each hat.
stratified sample

(d) In Fall 1995, the BBC in Britain requested viewers to call the network and indicate their favorite poem.
voluntary response sample

(e) Divide the class into four groups (freshman, sophomore, junior and senior) and take a random sample of two students from each group.
stratified sample

(f) Priceline.com randomly e-mails a Customer Satisfaction Survey for certain transactions done on its site in which customers choose to either respond or not.
voluntary response sample

Key

Population and Sample Practice

1. For each statement, identify whether the numbers underlined are statistics or parameters.
   a. Of all U.S. kindergarten teachers, 32% say that knowing the alphabet is an essential skill. parameter
   b. Of the 800 U.S. kindergarten teachers polled, 34% say that knowing the alphabet is an essential skill. statistic

2. Of the U.S. adult population, 36% has an allergy. A sample of 1200 randomly selected adults resulted in 33.2% reporting an allergy.
   a. Who is the population? the U.S. adult population
   b. What is the sample? 1200 randomly selected adults
   c. Identify the statistic and give its value. 33.2% of the sample has an allergy
   d. Identify the parameter and give its value. 36% of the population has an allergy

3. In your own words, explain why the parameter is fixed and the statistic varies.
   different samples would yield different statistics

4. Select 90 students currently enrolled at NCSU and ask how many years they've attended the university, how old they are, and if they live on campus.
   a. What is the population? all students currently enrolled at NCSU
   b. What is the sample? the 90 students selected

5. Suppose a 12 year old asked you to explain the difference between a sample and a population, how would you explain it to him/her? How might you explain why you would want to take a sample, rather than surveying every member of the population? A sample is a part of a whole population - if you have a big population (like everyone in GA) you may want to sample

6. In your own words, explain the difference between a statistic and a parameter.
   statistic describes a sample & parameter describes a population

7. A study reveals that there are exactly 100 Senators in the 109th Congress of the United States, and 55% of them are Republicans.
   a. Do the data comprise a sample or a population? Population → all 100 senators are included
   b. Do the results represent a statistic or a parameter? Parameter

8. Identify the population and the sample:
   a. A survey of 1353 American households found that 18% of the households own a computer. pop: all Amer. households; S: 1353 Amer. households
   b. A recent survey of 2625 elementary school children found that 28% of the children could be classified obese. sample ↗ pop: all elem. school children
   c. The average weight of every sixth person entering the mall within a 3-hour period was 146 lb. ↑ sample pop: everyone entering the mall within 3-hr period

9. Determine whether the numerical value is a parameter or a statistic (and explain):
   a. A recent survey by the alumni of a major university indicated that the average salary of 10,000 of its 300,000 graduates was 125,000. statistic b/c it came from a sample
   b. The average salary of all assembly-line employees at a certain car manufacturer is $33,000. parameter → from all employees
   c. The average late fee for 360 credit card holders was found to be $56.75. statistic b/c from only 360 card holders