

Assignment number: \_\_\_\_\_

**Collecting Data**

For problems 1-4 identify the following:

- The population of interest
- The sample
- The sampling method used and note if it was randomized
- Potential sources of bias and type of bias

<p>1. The American Medical Association asked all subscribers of a health magazine if they had used alternative medicines to treat illnesses. They were interested if the subscribers benefited from the alternative medicines. Approximately 30% of those who responded indicated they were cured or improved with alternative medicines.</p> <p><u>population</u>: All subscribers of magazine  <u>sample</u>: Those who responded to the survey  <u>sampling method</u>: non-random, convenience sample  <u>potential source of bias</u>: non-response, those who did respond most likely feel</p>	<p>2. A local Florida politician posted a survey on his site asking his constituents if they support the legalization of medical marijuana.</p> <p><u>P</u>: All of the politician's constituents  <u>S</u>: Those who took the survey  <u>SM</u>: voluntary response non-random  <u>PSOB</u>: Voluntary response bias... those who feel strongly will take the survey strongly about topic.</p>
<p>3. The Orange County Sheriff's Department randomly selected a night club and stopped every 10<sup>th</sup> person exiting the establishment. They asked the patron whether they thought drinking and driving was a serious problem.</p> <p><u>P</u>: All Orange County night club patrons  <u>S</u>: Every 10<sup>th</sup> person at selected night club  <u>SM</u>: Systematic sample. Random  <u>PSOB</u>: People leaving a night club might not think drinking and driving is a problem</p>	<p>4. United Airlines wants to improve their public image. They randomly select three airports they fly into and survey every passenger on a particular day about their flight experience.</p> <p><u>P</u>: All United Airlines passengers  <u>S</u>: Every passenger at the 3 selected airports  <u>SM</u>: Cluster Sample  <u>PSOB</u>: No evident source of bias</p>

5. Orange County Public Schools want to incorporate end of the year tests that elementary students would have to pass in order to move on to the next grade. The PTA wants to find out if parents support this plan. Below are some of the plans for gathering data. For each define what type of sampling method is used and what type of bias could potentially occur.

- a) Email all parents who belong to the PTA and ask them to take an online survey.
- b) Randomly select one elementary school and survey all of the students' parents.
- c) Send a survey home with every elementary student and ask the parents to return it the next day.
- d) Randomly select 30 students from every elementary school and send a survey home with the students. Follow up with a phone call to parents if the survey is not returned within a week.

- a) Convenience Sample  
Non-response bias  
Only parents who belong to PTA and respond are part of the sample. Only those who feel strongly will take survey.
- b) Cluster Sample  
No evident bias
- c) Census  
Non-response
- d) Simple Random Sample  
No evident bias

6. Some people are complaining that the Olympia football stadium does not have enough seating and is in need of refurbishment. Administrators at Olympia decide to survey the first 100 people entering the stadium for a Friday night game. Describe the bias in the sample.

This is a convenience sample.  
The first 100 people are probably big football fans.  
This will result in undercoverage.  
A large part of the population will not be represented.

7. Refer back to problem 5. The PTA have proposed different questions to ask the parents for their opinions.

Question 1: Should elementary students have to pass a high stakes test in order to remain with classmates?

Question 2: Should schools and students be held accountable for achieving learning goals demonstrated by an end of the year test that will allow them to move on to the next grade?

a) Do you think the responses from these two questions will differ? If so, how? What kind of bias is this?

Yes, the first question has a very negative feel.

"High Stakes" "Remain with Classmates"

This is wording bias. It favors one outcome over the other.

b) Create a question with more neutral wording that would more accurately represent parent's opinions.

Answers will vary

8. Wording Bias. Examine each of the questions for bias. If you believe the questions wording would lead to bias, create a better question.

a) Should the oil companies that pollute the environment pay for cleaning up the mess?

Wording bias  
"Pollute"  
"Clean up mess"

Answers will vary.

b) Since 18 year-olds are considered to be adults legally and serve in our military, is it fair that the drinking age is 21?

Wording bias  
"fair"

Answers will vary.