**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Notes: Using Statistical Data**

***Math Review***

Percents

* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a part of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Percents can be calculated from decimals by multiplying them by 100
	+ Example: (0.37)(100) = 37%
	+ Example (0.83)(100) = 83%
	+ Example: (1.58)(100) = 158%

*Calculate the percent for the following decimals.*

*0.43 \_\_\_\_\_\_\_\_\_ 0.64 \_\_\_\_\_\_\_\_\_ 1.93 \_\_\_\_\_\_\_\_\_ 5.49 \_\_\_\_\_\_\_\_\_*

Percentage Change

* 20% of a whole is not the same as a 20% increase, or a 20% decrease
	+ Example: Consider the number 30 ...
		- * 20% of 30 = (30)(0.2) = 6
			* 20% increase = 30 + (30)(0.2) = 30+6 = 36
			* 20% decrease = 30 - (30)(0.2) = 30-6 = 24
* *Example: There are 30 students in a class.*
	+ *40% got A’s on the last test. How many got A’s?*
	+ *Some students are joining the class to work on a project. There are 20% more students than there were before. How many students are there?*
	+ *The class is now too big and the counselor wants to take 30% of the students out. How many students need to leave?*

***Tabulating Survey Results***

Processing Data

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ responses — Determine how many people selected each possible response
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ responses — Determine the most common answers for each open-response question
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ percentages — Determine what percentage of the surveyed population agreed with each possible response
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ measures of central tendency — mean, median, mode

Percentages Formula



*Example:*

*Out of 500 students surveyed, 387 want Homecoming to be on a Saturday night instead of a Friday night*



*Example: 150 students were surveyed.*

* + - *35% said they use Facebook. How many use Facebook?*
		- *You give the survey to another 120 students. 60 of these students use Facebook. What percentage of students from both sections use Facebook?*

***Drawing Conclusions***

Common Errors

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ — sampling too few members of a population to draw statistically significant results; need at least 10%, but preferably as many students as can be reached, especially in smaller school settings
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ — Taking two different questions on a survey and indicating that they are related to one another, without a specific link between them
	+ *Example:*
		- *80% of students surveyed indicated they use Twitter*
		- *75% of students surveyed said they read the newspaper*
		- *THEREFORE, 75% of the school population would follow us on Twitter if we made an account, and we may be able to get 5% more of the school to read the newspaper that way*
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ — Drawing an extreme conclusion not supported by the data
	+ *Example: Students were asked if the newspaper met their informational and entertainment needs, or if it could be improved to reach them as a consumer.*
		- *45% of students believe the newspaper is mostly meeting their needs*
		- *25% of students believe the newspaper is exceeding their needs*
		- *30% of students believe the newspaper is not meeting their needs*
		- *THEREFORE, the newspaper does not need to make any changes, since the majority of students are happy with everything the newspaper is doing.*
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ — “Most” can only be applied when more than 50% of a group of people agree; it implies a majority
	+ *Example: Students were asked which social network they use most often.*
		- *If 40% of students use Facebook, 35% use Twitter and 25% use Vine, it is NOT accurate to say that MOST of the student body uses Facebook.*

Measures of Central Tendency

* \_\_\_\_\_\_\_\_\_\_\_\_ — the sum of all values in a set divided by the total number of values
* \_\_\_\_\_\_\_\_\_\_\_\_ — the middle value in an ordered set of values
* \_\_\_\_\_\_\_\_\_\_\_\_ — the most-often recurring value in a set of values
* *Example: 15 students were asked to rate the newspaper on a scale of 1-10, 1 being awful and 10 being amazing. Their answers: {1,2,2,2,2,2,3,3,5,6,8,9,9,9,10}*
	+ *Mean = (sum of set)/15 = (70)/(15) = 4.867*
	+ *Median = {1,2,2,2,2,2,3,3,5,6,8,9,9,9,10}*
	+ *Mode = 2*
* Use them when you have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ set of options or numbers, especially with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ questions
* Best to calculate \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ AND \_\_\_\_\_\_\_\_\_\_\_\_, not just one
	+ Each yields different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number (extreme high or low) could mess up the data
	+ An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is not always the best indicator

*Example: 25 students were asked how much time they spend using social media daily, expressed in 30 minute increments (0.5 = 30 minutes). Their answers:*

*{0.5, 5, 3, 2, 1, 6, 1.5, 1, 1.5, 3, 9, 0.5, 0.5, 0.5, 2, 2, 2, 2.5, 3, 1.5, 1, 1, 1, 1, 1.5}*

*Calculate the following for the set:*

*Mean*

*Median*

*Mode*

*Which number do you think is the most reliable for understanding the students’ behavior in this example? Why?*

 *Based on the results, do you believe this group of students would be likely to interact with an online publication? Why or why not?*