

Exploration 3: "Average" Salaries

1. **Small Business:** You are planning on starting a small company with six salaried positions. You want to offer a mean annual salary of \$45,000, a median annual salary of \$20,000, and a modal annual salary of \$10,000.
 - (a) Make a list of the job opportunities for your company along with each position's prospective salary. Explain how you arrived at your salaries.
 - (b) Verify each of the above conditions.
 - (c) What measure of center do you think is the best "average" salary indicator for your company? Explain.
 - (d) Is it possible to find other sets of salaries satisfying these conditions? If so, find some.
 - (e) Make at least three generalizations about any set of data that satisfies these criteria and explain why you think these are so.
 - (f) Suppose you wanted the mean annual salary and the median annual salary to be reversed. That is you wanted the mean annual salary to be \$20,000 and the median annual salary to be \$45,000. Is this possible? Explain.

2. **Weighted Averages:** The average salaries for two types of employees are listed for two companies.

<i>Support Staff</i>			<i>Technical Staff</i>		
	<i>Average Salary</i>	<i>Number Employed</i>		<i>Average Salary</i>	<i>Number Employed</i>
<i>Company A</i>	\$22,000	300	<i>Company A</i>	\$52,000	700
<i>Company B</i>	\$24,000	800	<i>Company B</i>	\$56,000	200

- (a) What is the overall mean average salary for the employees at Company A?
- (b) What is the overall mean average salary for the employees at Company B?
- (c) Which company has the highest average salary for support staff?
- (d) Which company has the highest average salary for technical staff?
- (e) In statistics this is an example of “Simpson’s Paradox” or aggregation bias. Explain why the overall average salary for Company A is higher than the overall average at Company B, yet the results in part (b) contradict this.
3. **Summary:** What have you learned about mean, median, and mode from doing this problem exploration that you did not know before?