Name: Date: Class:

Jupyter Notebook: Exploring "Typical" Values Using Data
Answer Key

In this activity, you will explore what a "typical" value means by analyzing a real dataset using statistics and graphs. You will use a Jupyter Notebook to calculate measures such as the mean, median, range, and standard deviation, then interpret histograms and boxplots to better understand the distribution of the data. Through this investigation, you will compare different measures of center and explain which statistic best represents the data.

Part 1: Prediction

1. What does a "typical" value mean to you?
   Answers will vary.
   Example answer: A "typical" value is a number that best represents most of the data in the dataset.

2. Do you think the mean and median of this dataset will be similar or different? Why?
   The mean and median could be different if there are a few unusually high or low values in the dataset that affect the mean more strongly.

Part 2: Data Exploration

3. After running the Jupyter Notebook, record your results:
   - Mean: _____
   - Median: _____
   - Range: _____
   - Standard Deviation: _____

   Students read the numbers for mean, median, range, and standard deviation. The mean, median, range, and standard deviation help describe the center and spread of the dataset.

4. Compare the mean and median. What do you notice?
   The mean and median were close when the data was balanced, but they became different when outliers were present.

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Part 3: Graph Interpretation

Look at the histogram and boxplot.

5. Describe the shape of the data (circle one):
   Symmetric Skewed Left Skewed Right
   The histogram and boxplot help show whether the data was symmetric or skewed.

6. Are there any outliers?
   Yes / No
   If yes, describe:
   Depending on the data, some values may be much larger or smaller than the rest of the dataset. These outliers can change the overall shape of the distribution and may affect the mean more strongly than the median.

Part 4: Reasoning

Look at the histogram and boxplot.

7. Which measure (mean or median) better represents a "typical" value for this dataset? Explain.
   When a dataset has outliers, the median often gives a better idea of a "typical" value because extreme values do not change it as much as they change the mean.

Part 5: Reflection

8. How do graphs and statistics work together to help you understand data?
   Students should say something about how graphs and statistics connect when analyzing data.

   Example answer: The mean and median help summarize the center of the dataset, while graphs help students see the overall distribution, spread, and possible outliers. Looking at both together gives a clearer idea of what values are most representative or "typical" in the dataset.