



# Elementary Statistics

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Competencies and Objectives	Page References
<b>NUMBER AND OPERATIONS</b>	
<b>1. Explore phenomena using probability and simulation. Compute appropriate statistical and probabilistic measures.</b>	
a. Describe the comparison of center and spread within groups and between or across group variation. (DOK 2)	SE: 96-110, 115-128
b. Interpret and apply the concept of the Law of Large Numbers. (DOK 2)	SE: 183-185
c. Apply the counting principles, including permutations and combinations. (DOK 1)	SE: 212-220, 223-226
d. Construct and interpret sample spaces, events, and tree diagrams. (DOK 2)	SE: 173-183
e. Identify types of events, including mutually exclusive, independent, and complements. (DOK 1)	SE: 179-180, 189-193, 199-208
f. Calculate geometric probability using two-dimensional models, and explain the processes used. (DOK 2)	SE: 301
g. Create simulations and experiments that correlate to theoretical probability. (DOK 2)	SE: 234, 726-731
h. Use Markov Chains to calculate probability by constructing matrix models. (DOK 2)	
i. Apply the concept of a random variable to generate and interpret probability distributions. (DOK 2)	SE: 239-244
<b>ALGEBRA</b>	
<b>2. Analyze one and two variable data using algebraic concepts and methods.</b>	
a. Analyze and describe outliers and shape of the data including linearity and correlation across graphs and data sets. (DOK 2)	SE: 528-541
b. Calculate mean, median, mode, standard deviation, z-scores, t-scores, quartiles, and ranges, and explain their applications. (DOK 2)	SE: 96-110, 115-128, 133-144, 152-157

Competencies and Objectives	Page References
c. Select and use appropriate statistical methods in decision-making and hypothesis testing. (DOK 2)	SE: 392-414, 419-426, 429-434, 437-445, 449-453
d. Use algebraic concepts and methods to determine mathematical models of best fit. (DOK 2)	SE: 558-572
<b>GEOMETRY</b>	
<b>3. Design an appropriate form of displaying data collected, whether in tabular or graphic form.</b>	
a. Organize data using graphs that are appropriate to the data set, including frequency distributions, stacked line and bar graphs, stem-and-leaf plots, scatter plot, frequency polygon, and histograms. (DOK 2)	SE: 34-43, 48-57, 63-77
b. Determine and justify the graph type that best represents a given set of data. (DOK 2)	SE: 34-43, 48-57, 63-77, 86
c. Create graphs with scales that fairly display the data. (DOK 2)	SE: 18, 70-73
<b>DATA ANALYSIS &amp; PROBABILITY</b>	
<b>4. Collect, read, interpret, and analyze data as it relates to the real world.</b>	
a. Make inferences and predictions from charts, tables, and graphs that summarize data. (DOK 3)	SE: 2-9
b. Determine the most appropriate measure to describe a data set, including mean, median, mode, standard deviation, and variance. (DOK 2)	SE: 152-156, 161
c. Use curve-fitting to make predictions from collected data. (DOK 2)	SE: 544-551
d. Explain and defend regression models using correlation coefficients and residuals. (DOK 2)	SE: 544-551, 558-565
<b>5. Design a study by clarifying a question and deciding upon a method of data collection and analysis.</b>	
a. Design and execute a statistical experiment, including the preparation of a report that communicates the statement of the problem, methodology, results, and conclusions. (DOK 4)	SE: 524, 617, 704, 708-718, 723-725, A-7
b. Explain the generalizability of results and types of conclusions that can be drawn from observational studies, empirical experiments, and surveys. (DOK 2)	SE: 9-19, 723-725
c. Analyze sources of bias and sampling error(s) in studies. (DOK 3)	SE: 322-329, 708-718, 723-725
d. Compare and contrast sampling methods, including simple random sampling, stratified random sampling, and cluster sampling with regard to benefits and trade-offs. (DOK 2)	SE: 9-13, 708-718