

STATE GOAL 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

Why This Goal Is Important: The ability to understand and interpret data (e.g., opinion polls, stock prices, tax rates, crime statistics, scientific studies, weather reports) grows more important each day. Students must be able to organize data, make sense of variables and patterns, and judge the logical reasonableness of any claims and interpretations made. Even very young students can count objects and communicate their findings with charts and graphs. Students of all ages can collect, display and interpret data to answer specific questions. They also must construct and analyze arguments that involve data and its interpretation. All students need to understand and apply the role probability plays in data collection and decision making. Data analysis and use are important abilities necessary for all careers.

A. Organize, describe and make predictions from existing data.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
10.A.1a Organize and display data using pictures, tallies, tables, charts or bar graphs.	10.A.2a Organize and display data using pictures, tallies, tables, charts, bar graphs, line graphs, line plots and stem-and-leaf graphs.	10.A.3a Construct, read and interpret tables, graphs (including circle graphs) and charts to organize and represent data.	10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box-plots.	10.A.5 Construct a statistics-based presentation, individually and as members of a team, to communicate and justify the results of a project.
10.A.1b Answer questions and make predictions based on given data.	10.A.2b Using a data set, determine mean, median, mode and range, with and without the use of technology.	10.A.3b Compare the mean, median, mode and range, with and without the use of technology.	10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.	
	10.A.2c Make predictions and decisions based on data and communicate their reasoning.	10.A.3c Test the reasonableness of an argument based on data and communicate their findings.	10.A.4c Predict from data using interpolation, extrapolation and trend lines, with and without the use of technology.	

B. Formulate questions, design data collection methods, gather and analyze data and communicate findings.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
10.B.1a Formulate questions of interest and design surveys or experiments to gather data.	10.B.2a Formulate questions of interest and select methods to systematically collect data.	10.B.3 Formulate questions (e.g., relationships between car age and mileage, average incomes and years of schooling), devise and conduct experiments or simulations, gather data, draw conclusions and communicate results to an audience using traditional methods and contemporary technologies.	10.B.4 Design and execute surveys or experiments, gather data to answer relevant questions, and communicate results and conclusions to an audience using traditional methods and contemporary technology.	10.B.5 Design a statistical experiment to answer a question about a realistic situation, conduct the experiment, use statistics to interpret the data, and communicate the results, individually and as members of a team.
10.B.1b Collect, organize and describe data using pictures, tallies, tables, charts or bar graphs.	10.B.2b Collect, organize and display data using tables, charts, bar graphs, line graphs, circle graphs, line plots and stem-and-leaf graphs.			
10.B.1c Analyze data, draw conclusions and communicate the results.	10.B.2c Analyze the data using mean, median, mode and range, as appropriate, with or without the use of technology.			
	10.B.2d Interpret results or make relevant decisions based on the data gathered.			

C. Determine, describe and apply the probabilities of events.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
10.C.1a Describe the concept of probability in relationship to likelihood and chance.	10.C.2a Calculate the probability of a simple event.	10.C.3a Determine the probability and odds of events using fundamental counting principles.	10.C.4a Solve problems of chance using the principles of probability including conditional settings.	10.C.5a Compute conditional probabilities and the probabilities of independent events.
10.C.1b Systematically list all possible outcomes of a simple one-stage experiment (e.g., the flip of one coin, the toss of one die, the spin of a spinner).	10.C.2b Compare the likelihood of events in terms of certain, more likely, less likely or impossible.	10.C.3b Analyze problem situations (e.g., board games, grading scales) and make predictions about results.	10.C.4b Design and conduct simulations (e.g., waiting times at restaurant, probabilities of births, likelihood of game prizes), with and without the use of technology.	10.C.5b Compute probabilities in counting situations involving permutations and combinations.

	10.C.2c Determine the probability of an event involving “and”, “or” or “not”.		10.C.4c Propose and interpret discrete probability distributions, with and without the use of technology.	10.C.5c Make predictions using probabilities associated with normally distributed events.
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