Elementary CSTA Standards with Related GAISE II Concepts

Elementary (K-2)

CSTA 1A-DA-06 Collect and present the same data in various visual formats. *The collection and use of data about the world around them is a routine part of life and influences how people live. Students could collect data on the weather, such as sunny days versus rainy days, the temperature at the beginning of the school day and end of the school day, or the inches of rain over the course of a storm. Students could count the number of pieces of each color of candy in a bag of candy, such as Skittles or M&Ms. Students could create surveys of things that interest them, such as favorite foods, pets, or TV shows, and collect answers to their surveys from their peers and others. The data collected could then be organized into two or more visualizations, such as a bar graph, pie chart, or pictograph.*

Related GAISE II concepts that can be addressed while focused on this CSTA standard:

- **Analyze the Data III.A.2** Represent the variability of categorical variables or quantitative variables using appropriate displays (e.g., tables, picture graphs, dotplots, bar graphs)

CSTA 1A-DA-07 Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions. *Data can be used to make inferences or predictions about the world. Students could analyze a graph or pie chart of the colors in a bag of candy or the averages for colors in multiple bags of candy, identify the patterns for which colors are most and least represented, and then make a prediction as to which colors will have most and least in a new bag of candy. Students could analyze graphs of temperatures taken at the beginning of the school day and end of the school day, identify the patterns of when temperatures rise and fall, and predict if they think the temperature will rise or fall at a particular time of the day, based on the pattern observed.*

Related GAISE II concepts that can be addressed while focused on this CSTA standard:

- **Formulate Statistical Investigative Questions I.A.1** Understand when a statistical investigation is appropriate
- **Analyze the Data III.A.5** Observe whether there appears to be an association between two variables

Elementary (3-5)

CSTA 1B-DA-06 Organize and present collected data visually to highlight relationships and support a claim. *Raw data has little meaning on its own. Data is often sorted or grouped to provide additional clarity. Organizing data can make interpreting and communicating it to others easier. Data points can be clustered by a number of commonalities. The same data could be manipulated in different ways to emphasize particular aspects or parts of the data set. For example, a data set of sports teams could be sorted by wins, points scored, or points allowed, and a data set of weather information could be sorted by high temperatures, low temperatures, or precipitation.*

Related GAISE II concepts that can be addressed while focused on this CSTA standard:

- **Analyze the Data III.A.2** Represent the variability of categorical variables or quantitative variables using appropriate displays (e.g., tables, picture graphs, dotplots, bar graphs)
- **Analyze the Data III.C.1** Use technology to subset and filter data sets and transform variables, including smoothing for time series data

CSTA 1B-DA-07 Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea. *The accuracy of data analysis is related to how realistically data is represented. Inferences or predictions based on data are less likely to be accurate if the data is not sufficient or if the data is incorrect in some way. Students should be able to refer to data when communicating an idea. For example, in order to explore the relationship between speed, time, and distance, students could operate a robot at uniform speed, and at increasing time intervals to predict how far the robot travels at that speed. In order to make an accurate prediction, one or two attempts of differing times would not be enough. The robot may also collect temperature data from a sensor, but that data would not be relevant for the task. Students must also make accurate measurements of the distance the robot travels in order to develop a valid prediction. Students could record the temperature at noon each day as a basis to show that temperatures are higher in certain months of the year. If temperatures are not recorded on non-school days or are recorded incorrectly or at different times of the day, the data would be incomplete and the ideas being communicated could be inaccurate. Students may also record the day of the week on which the data was collected, but this would have no relevance to whether temperatures are higher or lower. In order to have sufficient and accurate data on which to communicate the idea, students might want to use data provided by a governmental weather agency.*

Related GAISE II concepts that can be addressed while focused on this CSTA standard:

- **Collect Data/ Consider Data II.A.2** Understand how to collect and record information from the group of interest using surveys and measurements collected from observations and simple experiments
- **Analyze the Data III.C.3** Summarize and describe relationships among multiple variables