Georgia Mathematics

Statistical Reasoning

Mathematical Practices

0 Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals. SR.MP

- 0.1 Make sense of problems and persevere in solving them. SR.MP.1
- 0.2 Reason abstractly and quantitatively. SR.MP.2
- 0.3 Construct viable arguments and critique the reasoning of others. SR.MP.3
- 0.4 Model with mathematics. SR.MP.4
- 0.5 Use appropriate tools strategically. SR.MP.5
- 0.6 Attend to precision. SR.MP.6
- 0.7 Look for and make use of structure. SR.MP.7
- 0.8 Look for and express regularity in repeated reasoning. SR.MP.8

Mathematical Modeling

1 Apply mathematics to real-life situations; model real-life phenomena using mathematics. SR.MM.1

- 1.1 Explain contextual, mathematical problems using a mathematical model. SR.MM.1.1
- 1.2 Create mathematical models to explain phenomena that exist in the natural sciences, social sciences, liberal arts, fine and performing arts, and/or the humanities. SR.MM.1.2
- 1.3 Using abstract and quantitative reasoning, make decisions about information and data from a real-life situation. SR.MM.1.3
- 1.4 Use various mathematical representations and structures with this information to represent and solve real-life problems. SR.MM.1.4

Data & Statistical Reasoning

2 Formulate statistical investigative questions of interest to students that can be answered with data. SR.DSR.2

- 2.1 Formulate statistical investigative questions about a population using samples taken from the population. SR.DSR.2.1
- 2.2 Formulate comparative and associative statistical investigative questions for surveys, observational studies, and experiments to compare two or more groups or to investigate the association of two or more variables. SR.DSR.2.2
- 2.3 Formulate multivariable statistical investigative questions. SR.DSR.2.3
- 2.4 Formulate inferential statistical investigative questions regarding association and prediction. SR.DSR.2.4

3 Collect data by designing and implementing a plan to address the formulated statistical investigative question. SR.DSR.3

- 3.1 Apply an appropriate data-collection plan when collecting primary or secondary data for the statistical investigative question of interest. SR.DSR.3.1
- 3.2 Distinguish between surveys, observational studies, and experiments. SR.DSR.3.2
- 3.3 Design sample surveys, experiments, and observational studies using accepted practices. SR.DSR.3.3
- 3.4 Distinguish between random selection and random assignment and identify their impact on conclusions. SR.DSR.3.4
- 3.5 Describe potential sources and effects of bias and confounding variables. SR.DSR.3.5
- 3.6 Describe and adhere to the ethical use of data (e.g., sensitive information, privacy, and living subjects). SR.DSR.3.6
- 3.7 Identify when data can be generalized to a target population. SR.DSR.3.7

4 Analyze data by selecting and using appropriate graphical and numerical methods. SR.DSR.4

- 4.1 Summarize quantitative or categorical data using tables, graphical displays, and numerical summary statistics. SR.DSR.4.1
- 4.2 Summarize and describe relationships among multiple variables. SR.DSR.4.2
- 4.3 Use sampling distributions developed through simulation to describe the sample-to-sample variability of sample statistics. SR.DSR.4.3
- 4.4 Use sampling distributions to compute simulated p-values. SR.DSR.4.4
- 4.5 Describe the relationship between two quantitative variables by interpreting correlation (r) and a least-square regression line (using technology). SR.DSR.4.5
- 4.6 Use simulations to investigate associations between two categorical variables and to compare groups. SR.DSR.4.6

5 Interpret the results of the analysis, making connections to the formulated statistical investigative question. SR.DSR.5

- 5.1 Use statistical evidence from analyses to answer the formulated statistical investigative questions. SR.DSR.5.1
- 5.2 Interpret the impact of outliers, missing values, or erroneous values on the results. SR.DSR.5.2
- 5.3 Use and interpret the p-value to determine whether the estimate for a population characteristic is plausible. SR.DSR.5.3
- 5.4 Interpret a given margin of error associated with an estimate of a population characteristic. SR.DSR.5.4
- 5.5 Explain the impact of multiple variables on one another. SR.DSR.5.5