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
- .3 Formulate multivariable statistical investigative questions. SR.DSR.2.3

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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

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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