Mohawk Local Schools Algebra II

Quarter 4 Curriculum Guide

Mathematical Practices

1. Make Sense of Problems and Persevere in Solving them
2. Reasoning Abstractly & Quantitatively
3. Construct Viable Arguments and Critique the Reasoning of Others
4. Model with Mathematics
5. Use Appropriate Tools Strategically
6. Attend to Precision
7. Look for and Make use of Structure
8. Look for and Express Regularity in Repeated Reasoning

Critical Areas of Focus Being Addressed:

- Inferences and Conclusions from Data

A.SSE.4 Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.*(Modeling standard) [DOK 2]	DOK 1: Find the first term in a geometric sequence given at least two other terms. Define a geometric series as a series with a constant ratio between successive terms. Use the formula $S = a\frac{1-r^n}{1-r}$ or an equivalent form to solve problems. DOK 2: Derive a formula (i.e. equivalent to the formula $S = a\frac{1-r^n}{1-r}$) for the sum of a finite geometric series (when the common

	ratio is not 1). Note from Appendix A: Consider extending A.SSE.4 to infinite geometric series in curricular implementations of this course description.
S.ID.4 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. *Statistics and Probability is a Modeling Conceptual Category [DOK 2]	DOK 1: Describe the characteristics of a normal distribution. Use a calculator, spreadsheet, and table to estimate areas under the normal curve. DOK 2: Use the mean and standard deviation of a data set to fit it to a normal distribution. Use a normal distribution to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. From Appendix A: While students may have heard of the normal distribution, it is unlikely that they will have prior experience using it to make specific estimates. Build on students' understanding of data distributions to help them see how the normal distribution uses area to make estimates of frequencies (which can be expressed as probabilities). Emphasize that only some data are well described by a normal distribution.
S.IC.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population. *Statistics and Probability is a Modeling Conceptual Category [DOK 1]	DOK 1: Explain that statistics is a process for making inferences about population parameters, or characteristics. Explain that statistical inferences about population characteristics are based on random samples from that population.
S.IC.2 Decide if a specified model is consistent with results from a given data-generating process, eg., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model? [DOK 2]	DOK 1: Use various, specified data-generating processes/models (e.g. computer models, physical recreations of experiments, etc.) Recognize data that various models produce. Identify data or discrepancies that provide the basis for rejecting a statistical model. DOK 2: Decide if a specified model is consistent with results from a

	given data-generating process, eg., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model? From Appendix A: For S.IC.2, include comparing theoretical and empirical results to evaluate the effectiveness of a treatment.
S.IC.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. [DOK 1]	DOK 1: Recognize the purpose of surveys, experiments, and observational studies in making statistical inferences and justifying conclusions and explain how randomization relates to each of these methods of data collection. Recognize the differences among surveys, experiments, and observational studies in making statistical inferences and justifying conclusions explain how randomization relates to each of these methods of data collection. DOK 2: Note from Appendix A: In earlier grades, students are introduced to different ways of collecting data and use graphical displays and summary statistics to make comparisons. These ideas are revisited with a focus on how the way in which data is collected determines the scope and nature of the conclusions that can be drawn from that data. The concept of statistical significance is developed informally through simulation as meaning a result that is unlikely to have occurred solely as a result of random selection in sampling or random assignment in an experiment.
S.IC.4 Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. [DOK 2]	DOK 1: Define margin of error Explain the connection of margin of error to variation within a data set or population. Use a simulation model to generate data for random sampling, assuming certain population parameters/ characteristics. DOK 2: Use data from a sample survey to estimate a population mean

	or proportion. Interpret the data generated by a simulation model for random sampling in terms of the context the simulation models. Develop a margin of error, assuming certain population parameters/ characteristics, through the use of simulation models for random sampling. From Appendix A: Focus on the variability of results from experiments—that is, focus on statistics as a way of dealing with, not eliminating, inherent randomness.
S.IC.5 Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between two parameters are significant. [DOK 2]	DOK 1: Using an established level of significance, determine if the difference between two parameters is significant. DOK 2: Use data from a randomized experiment to compare two treatments. Choose appropriate method to simulate a randomized experiment. Establish a reasonable level of significance. From Appendix A: Focus on the variability of results from experiments—that is, focus on statistics as a way of dealing with, not eliminating, inherent randomness.
S.IC.6 Evaluate reports based on data. * *Statistics and Probability is a Modeling Conceptual Category [DOK 2]	DOK 1: Define the characteristics of experimental design (control, randomization, and replication). DOK 2: Evaluate the experimental study design, how the data was gathered, what analysis (numerical or graphical) was used (ex: use of randomization, control, replication). Draw conclusions based on graphical and numerical summaries. Support with graphical and numerical summaries how "appropriate" the report of data was (ex: consider the existence of outliers, correlation coefficient with both linear and non-linear data, margin of error)