

North Carolina Tutorials are designed specifically for the Common Core State Standards for English language arts, the North Carolina Standard Course of Study for Math, and the North Carolina Essential Standards, to prepare students for the READY End-of-Course Assessments.

Math Tutorials offer targeted instruction, practice and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. They automatically identify and address learning gaps down to elementary-level content, using adaptive remediation to bring students to grade-level no matter where they start. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing the ability to apply their knowledge in abstract and real world scenarios, students build the depth of knowledge and higher order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, modeled logic and process, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

Unit 1: Rate, Ratio, and Proportion

- **UNIT RATES**

- NC.7.RP.1: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Compute unit rates associated with ratios of fractions to solve real-world and mathematical problems.
- NC.7.RP.2.a.1: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios. Represent proportional relationships using tables and graphs.
- NC.7.RP.2.a.2: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios. Recognize whether ratios are in a proportional relationship using tables and graphs.
- NC.7.RP.2.a.3: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios.

Compare two different proportional relationships using tables, graphs, equations, and verbal descriptions.

- **IDENTIFYING PROPORTIONAL RELATIONSHIPS**

- NC.7.RP.2.c: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Create equations and graphs to represent proportional relationships.
- NC.7.RP.2.a.1: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios. Represent proportional relationships using tables and graphs.
- NC.7.RP.2.a.2: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios. Recognize whether ratios are in a proportional relationship using tables and graphs.

Unit 2: Problem Solving Using Proportions

- **ANALYZING PROPORTIONAL RELATIONSHIPS**

- NC.7.RP.2.b: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Identify the unit rate (constant of proportionality) within two quantities in a proportional relationship using tables, graphs, equations, and verbal descriptions.
- NC.7.RP.1: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Compute unit rates associated with ratios of fractions to solve real-world and mathematical problems.
- NC.7.RP.2.a.1: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios. Represent proportional relationships using tables and graphs.
- NC.7.RP.2.a.2: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios. Recognize whether ratios are in a proportional relationship using tables and graphs.
- NC.7.RP.2.a.3: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios. Compare two different proportional relationships using tables, graphs, equations, and verbal descriptions.

- **REPRESENTING PROPORTIONAL RELATIONSHIPS**

- NC.7.RP.2.c: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Create equations and graphs to represent proportional relationships.
- NC.7.RP.2.a.2: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Understand that a proportion is a relationship of equality between ratios. Recognize whether ratios are in a proportional relationship using tables and graphs.
- NC.7.RP.2.d.1: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Use a graphical representation of a proportional relationship in context to: Explain the meaning of any point (x, y) .
- NC.7.RP.2.d.2: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Use a graphical representation of a proportional relationship in context to: Explain the meaning of $(0, 0)$ and why it is included.
- NC.7.RP.2.d.3: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Use a graphical representation of a proportional relationship in context to: Understand that the y -coordinate of the ordered pair $(1, r)$ corresponds to the unit rate and explain its meaning.
- NC.7.RP.3: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Use scale factors and unit rates in proportional relationships to solve ratio and percent problems.
- **USING PROPORTIONS TO SOLVE PROBLEMS**
- NC.7.RP.3: Ratio and Proportional Relationships Analyze proportional relationships and use them to solve real-world and mathematical problems. Use scale factors and unit rates in proportional relationships to solve ratio and percent problems.

Unit 3: Addition and Subtraction of Rational Numbers

- **ADDING RATIONAL NUMBERS**
- NC.7.NS.3: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
- NC.7.NS.1: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, using the properties of operations, and describing real-world contexts using sums and differences.
- **SUBTRACTING RATIONAL NUMBERS**

- NC.7.NS.3: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
- NC.7.NS.1: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, using the properties of operations, and describing real-world contexts using sums and differences.
- NC.7.EE.3.i: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Apply properties of operations to calculate with positive and negative numbers in any form.
- NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.
- **USING PROPERTIES TO ADD AND SUBTRACT RATIONAL NUMBERS**
 - NC.7.NS.1: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, using the properties of operations, and describing real-world contexts using sums and differences.
 - NC.7.NS.3: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
 - NC.7.EE.3.i: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Apply properties of operations to calculate with positive and negative numbers in any form.
 - NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.

Unit 4: Multiplication and Division of Rational Numbers

- **MULTIPLYING RATIONAL NUMBERS**
 - NC.7.NS.2.b: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division. Apply properties of operations as strategies, including the standard algorithms, to multiply and divide rational numbers and describe the product and quotient in real-world contexts.

- NC.7.NS.3: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
 - NC.7.EE.3.i: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Apply properties of operations to calculate with positive and negative numbers in any form.
 - NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.
- **DIVIDING RATIONAL NUMBERS**
 - NC.7.NS.2.a: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division. Understand that a rational number is any number that can be written as a quotient of integers with a non-zero divisor.
 - NC.7.NS.2.b: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division. Apply properties of operations as strategies, including the standard algorithms, to multiply and divide rational numbers and describe the product and quotient in real-world contexts.
 - NC.7.NS.3: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
 - NC.7.EE.3.i: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Apply properties of operations to calculate with positive and negative numbers in any form.
 - NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.
 - **USING PROPERTIES TO MULTIPLY AND DIVIDE RATIONAL NUMBERS**
 - NC.7.NS.2.b: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division. Apply properties of operations as strategies, including the standard algorithms, to multiply and divide rational numbers and describe the product and quotient in real-world contexts.

- NC.7.NS.3: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
- NC.7.EE.3.i: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Apply properties of operations to calculate with positive and negative numbers in any form.
- NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.

Unit 5: Problem Solving Using Rational Numbers

EXPRESSING RATIONAL NUMBERS IN DECIMAL FORM

- NC.7.NS.2.c.1: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division. Use division and previous understandings of fractions and decimals. Convert a fraction to a decimal using long division.
- NC.7.NS.2.c.2: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division. Use division and previous understandings of fractions and decimals. Understand that the decimal form of a rational number terminates in 0s or eventually repeats.
- NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.

USING OPERATIONS ON RATIONAL NUMBERS TO SOLVE PROBLEMS

- NC.7.NS.1: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, using the properties of operations, and describing real-world contexts using sums and differences.
- NC.7.NS.2.b: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division. Apply properties of operations as strategies, including the standard algorithms, to multiply and divide rational numbers and describe the product and quotient in real-world contexts.
- NC.7.NS.3: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.

- NC.7.EE.3.i: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Apply properties of operations to calculate with positive and negative numbers in any form.
- NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.
- **SOLVING MULTI-STEP PROBLEMS WITH RATIONAL NUMBERS**
 - NC.7.NS.1: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, using the properties of operations, and describing real-world contexts using sums and differences.
 - NC.7.NS.2.b: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division. Apply properties of operations as strategies, including the standard algorithms, to multiply and divide rational numbers and describe the product and quotient in real-world contexts.
 - NC.7.NS.3: The Number System Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
 - NC.7.EE.3.i: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Apply properties of operations to calculate with positive and negative numbers in any form.
 - NC.7.EE.2: Expressions and Equations Use properties of operations to generate equivalent expressions. Understand that equivalent expressions can reveal real-world and mathematical relationships. Interpret the meaning of the parts of each expression in context.
 - NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.
 - NC.7.EE.4.a.1: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Use variables to represent quantities to solve real-world or mathematical problems. Construct equations to solve problems by reasoning about the quantities. Fluently solve multistep equations with the variable on one side, including those generated by word problems.
 - NC.7.EE.4.a.2: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Use variables to represent

quantities to solve real-world or mathematical problems. Construct equations to solve problems by reasoning about the quantities. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

- NC.7.EE.4.a.3: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Use variables to represent quantities to solve real-world or mathematical problems. Construct equations to solve problems by reasoning about the quantities. Interpret the solution in context.

Unit 6: Algebraic Expressions, Equations, and Inequalities

• SIMPLIFYING AND REWRITING ALGEBRAIC EXPRESSIONS

- NC.7.EE.1.i: Expressions and Equations Use properties of operations to generate equivalent expressions. Apply properties of operations as strategies to: Add, subtract, and expand linear expressions with rational coefficients.
- NC.7.EE.2: Expressions and Equations Use properties of operations to generate equivalent expressions. Understand that equivalent expressions can reveal real-world and mathematical relationships. Interpret the meaning of the parts of each expression in context.
- NC.7.EE.3.ii: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. Convert between different forms of a number and equivalent forms of the expression as appropriate.

• SOLVING TWO-STEP EQUATIONS

- NC.7.EE.4.a.1: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Use variables to represent quantities to solve real-world or mathematical problems. Construct equations to solve problems by reasoning about the quantities. Fluently solve multistep equations with the variable on one side, including those generated by word problems.
- NC.7.EE.4.a.2: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Use variables to represent quantities to solve real-world or mathematical problems. Construct equations to solve problems by reasoning about the quantities. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

• SOLVING LINEAR INEQUALITIES

- NC.7.EE.4.b.1: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Use variables to represent quantities to solve real-world or mathematical problems. Construct inequalities to solve problems by reasoning about the quantities. Fluently solve multi-step inequalities with the variable on one side, including those generated by word problems.
- NC.7.EE.4.b.3: Expressions and Equations Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities. Use variables to represent

quantities to solve real-world or mathematical problems. Construct inequalities to solve problems by reasoning about the quantities. Graph the solution set of the inequality and interpret in context.

Unit 7: Drawing, Constructing, and Exploring Geometric Figures

- **SCALE DRAWINGS**

- NC.7.G.1.i: Geometry Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures by: Building an understanding that angle measures remain the same and side lengths are proportional.
- NC.7.G.1.ii: Geometry Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures by: Using a scale factor to compute actual lengths and areas from a scale drawing.
- NC.7.G.1.iii: Geometry Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures by: Creating a scale drawing.

- **GEOMETRIC DRAWINGS**

- NC.7.G.2: Geometry Draw, construct, and describe geometrical figures and describe the relationships between them. Understand the characteristics of angles and side lengths that create a unique triangle, more than one triangle or no triangle. Build triangles from three measures of angles and/or sides.

Unit 8: Geometry

- **CIRCLES**

- NC.7.G.4.i: Geometry Solve real-world and mathematical problems involving angle measure, area, surface area, and volume. Understand area and circumference of a circle. Understand the relationships between the radius, diameter, circumference, and area.
- NC.7.G.4.ii: Geometry Solve real-world and mathematical problems involving angle measure, area, surface area, and volume. Understand area and circumference of a circle. Apply the formulas for area and circumference of a circle to solve problems.

- **ANGLE RELATIONSHIPS**

- NC.7.G.5: Geometry Solve real-world and mathematical problems involving angle measure, area, surface area, and volume. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve equations for an unknown angle in a figure.

- **AREA, VOLUME, AND SURFACE AREA**

- NC.7.G.6.i: Geometry Solve real-world and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving: Area and perimeter of two-dimensional objects composed of triangles, quadrilaterals, and polygons.

Unit 9: Statistics and Sampling

- **POPULATIONS AND SAMPLES**

- NC.7.SP.2: Statistics and Probability Use random sampling to draw inferences about a population. Generate multiple random samples (or simulated samples) of the same size to gauge the variation in estimates or predictions, and use this data to draw inferences about a population with an unknown characteristic of interest.
- NC.7.SP.1.i: Statistics and Probability Use random sampling to draw inferences about a population. Understand that statistics can be used to gain information about a population by: Recognizing that generalizations about a population from a sample are valid only if the sample is representative of that population.
- NC.7.SP.1.ii: Statistics and Probability Use random sampling to draw inferences about a population. Understand that statistics can be used to gain information about a population by: Using random sampling to produce representative samples to support valid inferences.
- NC.7.SP.4: Statistics and Probability Make informal inferences to compare two populations. Use measures of center and measures of variability for numerical data from random samples to draw comparative inferences about two populations.
- **COMPARING DATA SETS VISUALLY**
 - NC.7.SP.4: Statistics and Probability Make informal inferences to compare two populations. Use measures of center and measures of variability for numerical data from random samples to draw comparative inferences about two populations.
 - NC.7.SP.3.a.1: Statistics and Probability Make informal inferences to compare two populations. Recognize the role of variability when comparing two populations. Calculate the measure of variability of a data set and understand that it describes how the values of the data set vary with a single number. Understand the mean absolute deviation of a data set is a measure of variability that describes the average distance that points within a data set are from the mean of the data set.
 - NC.7.SP.3.b: Statistics and Probability Make informal inferences to compare two populations. Recognize the role of variability when comparing two populations. Informally assess the difference between two data sets by examining the overlap and separation between the graphical representations of two data sets.
- **USING STATISTICAL MEASURES TO COMPARE DATA SETS**
 - NC.7.SP.4: Statistics and Probability Make informal inferences to compare two populations. Use measures of center and measures of variability for numerical data from random samples to draw comparative inferences about two populations.
 - NC.7.SP.3.a.1: Statistics and Probability Make informal inferences to compare two populations. Recognize the role of variability when comparing two populations. Calculate the measure of variability of a data set and understand that it describes how the values of the data set vary with a single number. Understand the mean absolute deviation of a data set is a measure of variability that describes the average distance that points within a data set are from the mean of the data set.
 - NC.7.SP.3.a.2: Statistics and Probability Make informal inferences to compare two populations. Recognize the role of variability when comparing two populations. Calculate the measure of variability

of a data set and understand that it describes how the values of the data set vary with a single number. Understand that the range describes the spread of the entire data set.

- NC.7.SP.3.a.3: Statistics and Probability Make informal inferences to compare two populations. Recognize the role of variability when comparing two populations. Calculate the measure of variability of a data set and understand that it describes how the values of the data set vary with a single number. Understand that the interquartile range describes the spread of the middle 50 of the data.

Unit 10: Probability I

• PROBABILITY

- NC.7.SP.5: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.
- NC.7.SP.6: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Collect data to calculate the experimental probability of a chance event, observing its long-run relative frequency. Use this experimental probability to predict the approximate relative frequency.
- NC.7.SP.2: Statistics and Probability Use random sampling to draw inferences about a population. Generate multiple random samples (or simulated samples) of the same size to gauge the variation in estimates or predictions, and use this data to draw inferences about a population with an unknown characteristic of interest.
- NC.7.SP.1.i: Statistics and Probability Use random sampling to draw inferences about a population. Understand that statistics can be used to gain information about a population by: Recognizing that generalizations about a population from a sample are valid only if the sample is representative of that population.
- NC.7.SP.1.ii: Statistics and Probability Use random sampling to draw inferences about a population. Understand that statistics can be used to gain information about a population by: Using random sampling to produce representative samples to support valid inferences.

• CALCULATING PROBABILITY

- NC.7.SP.7.a: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Develop a probability model and use it to find probabilities of simple events. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
- NC.7.SP.8.a: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Determine probabilities of compound events using organized lists, tables, tree diagrams, and simulation. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
- NC.7.SP.7.b: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Develop a probability model and use it to find probabilities of simple events. Develop a probability model (which may not be uniform) by repeatedly performing a chance process and observing frequencies in the data generated.

- NC.7.SP.7.c: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Develop a probability model and use it to find probabilities of simple events. Compare theoretical and experimental probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

Unit 11: Probability II

• PROBABILITY OF COMPOUND EVENTS

- NC.7.SP.5: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.
- NC.7.SP.8.a: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Determine probabilities of compound events using organized lists, tables, tree diagrams, and simulation. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
- NC.7.SP.8.b: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Determine probabilities of compound events using organized lists, tables, tree diagrams, and simulation. For an event described in everyday language, identify the outcomes in the sample space which compose the event, when the sample space is represented using organized lists, tables, and tree diagrams.

• SIMULATIONS

- NC.7.SP.8.a: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Determine probabilities of compound events using organized lists, tables, tree diagrams, and simulation. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
- NC.7.SP.8.c: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Determine probabilities of compound events using organized lists, tables, tree diagrams, and simulation. Design and use a simulation to generate frequencies for compound events.
- NC.7.SP.5: Statistics and Probability Investigate chance processes and develop, use, and evaluate probability models. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.