Math 7 (2 of 2)

Course Description: In this course, students begin with rewriting and simplifying expressions. Then, they solve multi-step linear equations and inequalities by using different methods. Finally, they learn about probability. They calculate expected and estimated probabilities of simple and compound events. They also use random samples to make some conclusions about populations.

Course Objectives:

- Write number sentences with a sum of 0.
- Combine like terms (including those with rational coefficients) using the Commutative Property of Addition.
- Combine like terms (including those with rational coefficients) using the Associative Property of Addition.
- Simplify expressions (including those with rational numbers) using the Distributive Property.
- Factor expressions (including those with rational numbers) using the Distributive Property.
- Identify the correct operations that complete true mathematical sentences (equations).
- Determine expressions that represent situations.
- Rewrite algebraic expressions in equivalent forms.
- Explain the relationships of expressions in equations.
- Solve word problems that lead to equations of the form px+q=r.
- Write equations that lead to equations of the form px+q=r for verbal descriptions.
- Make sense of problems and persevere in solving them.
- Solve multi-step linear equations in one variable.
- Solve word problems leading to equations of the form px+q=r or p(x+q)=r, where p, q, and r are rational numbers.
- Compare arithmetic solutions to algebraic solutions.
- Write equations from arithmetic solutions.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Solve real-world problems involving rational numbers.
- Write multi-step, single-variable, linear equations from a context that includes rational numbers.
- Identify equivalent forms of algebraic equations.
- Apply properties of operations to evaluate expressions.
- Estimate solutions to real-world problems involving rational numbers.

- Determine whether solutions are reasonable.
- Estimate solutions to real-world problems involving rational numbers.
- Determine whether solutions are reasonable.
- Compare arithmetic solutions to algebraic solutions.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Write inequalities that lead to the form $px+q>r$ or $px+q<r$.
- Solve inequalities that lead to the form $px+q>r$ or $px+q<r$.
- Interpret solutions of inequalities in context.
- Graph solutions of inequalities that lead to the form $px+q>r$ or $px+q<r$.
- Define probability.
- Identify possible outcomes.
- Define sample space.
- Calculate experimental probabilities.
- Identify which events are more likely to occur.
- Identify likely and unlikely events.
- Calculate theoretical probabilities.
- Determine probability models from given frequencies.
- Determine probability models from given probabilities.
- Determine probabilities from given probability models.
- Predict relative frequencies in probability models.
- Compare experimental and theoretical probabilities.
- Identify variations in experimental and theoretical probabilities in probability models.
- Analyze differences in experimental and theoretical probabilities.
- Define compound events.
- Identify compound events.
- Find the number of possible outcomes of sample spaces for compound events.
- Calculate probabilities of compound events.
- Interpret compound events.
- Classify events as certain, likely, even, unlikely, or impossible.
- Represent sample spaces for compound events by using lists.

- Represent sample spaces for compound events by using tables.
- Identify outcomes of sample spaces for compound events.
- Calculate probabilities of compound events by using organized lists.
- Calculate probabilities of compound events by using tables.
- Represent sample spaces for compound events by using tree diagrams.
- Identify outcomes of sample spaces for compound events.
- Calculate probabilities of compound events by using tree diagrams.
- Calculate compound probabilities by using simulations.
- Select a simulation that is the best model based on the theoretical probabilities in a situation.
- Design a simulation that generates frequencies for compound events.
- Identify populations and samples from contexts.
- Determine valid methods for taking random samples.
- Describe how random sampling can lead to valid results.
- Analyze how samples are obtained to determine whether they are random samples.
- Calculate values for populations from sample results.
- Make inferences about populations.
- Analyze how samples are obtained to determine whether they are random samples.
- Interpret collected data to determine the reliability of the results.
- Interpret variation in estimates or predictions from multiple samples of the same size.
- Interpret the results of collected data to make predictions or decisions.
- Find mean absolute deviations.
- Compare the variability in two data sets.
- Compare two data sets in terms of their contexts.
- Explain the difference between two medians or means with similar variability with measures of variability.
- Describe data from visual representations.
- Compare two data sets in terms of their contexts.
- Determine means of data sets.
- Determine medians of data sets.
- Determine interquartile ranges of data sets.

Required Materials:

In course.

Course Overview:

Unit 1: Simplify Expressions and Equations

- Direct Instruction Activities (Lessons 1-5)
    - Key Terms
    - Texts (lesson titles): Expressions with Addition and Subtraction; Apply the Distributive Property; Equivalent Expressions; Interpret Situations; Solve Equations
    - Step-by-Step Example Problems
    - Workbooks
- Checkpoint (Lessons 1-4)
- Project – Part 1 (Lesson 4)
- Unit 1 Exam (Lesson 5)

Unit 2: Solve Problems with Equations and Inequalities

- Direct Instruction Activities (Lessons 6-10)
    - Key Terms
    - Texts (lesson titles): Compare Methods of Problem Solving; Solve Percent Problems Using Equations; Solve Problems with Rational Numbers; Use Inequalities; Graph and Describe Inequalities
    - Step-by-Step Example Problems
    - Workbooks
- Checkpoint (Lessons 6-9)
- Project – Part 2 and Part 3 (Lessons 6 and 8)
- Unit 2 Exam (Lesson 10)

Unit 3: Probability Basics

- Direct Instruction Activities (Lessons 11-15)
    - Key Terms
    - Texts (lesson titles): Introduction to Probability; Probability Models; Events with Equal Chances; Events with Unequal Chances; Compare Experimental and Theoretical Probabilities
    - Step-by-Step Example Problems

- Workbooks

- Checkpoint (Lessons 11-14)
- Unit 3 Exam (Lesson 15)

Unit 4: Compound Events

- Direct Instruction Activities (Lessons 16-19)
    - Key Terms
    - Texts (lesson titles): Probabilities of Compound Events; Use Lists and Tables for Compound Probabilities; Use Tree Diagrams for Compound Probabilities; Simulations for Compound Events
    - Step-by-Step Example Problems
    - Workbooks
- Checkpoint (Lessons 16-18)
- Unit 4 Exam (Lesson 19)

Unit 5: Samples and Inferences

- Direct Instruction Activities (Lessons 20-24)
    - Key Terms
    - Texts (lesson titles): Populations and Samples; Random Samples; Use Random Samples; Interpret Sample Results; Make Predictions
    - Step-by-Step Example Problems
    - Workbooks
- Checkpoint (Lessons 20-23)
- Discussion (Lesson 23)
- Unit 5 Exam (Lesson 24)

Unit 6: Compare Data Sets

- Direct Instruction Activities (Lessons 25-28)
    - Key Terms
    - Texts (lesson titles): Compare Data Using Tables; Difference of Means and Medians; Compare Data Using Dot Plots; Compare Data Using Box Plots
    - Step-by-Step Example Problems
    - Workbooks
- Unit 1-Unit 6 Reviews (Lesson 29)

- Checkpoint (Lessons 25-27)
- Unit 6 Exam (Lesson 28)
- Course Final Exam (Lesson 30)
- Course Summary (Lesson 30)