

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

**Lesson 01 - Whole Number Addition; Properties, Estimation, and Problem Solving**

Math 5 Lesson 01 - Whole Number Addition; Properties, Estimation, and Problem Solving

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
F. Apply number system properties when performing computations. (05-07)
07. Use commutative, associative, distributive, identity and inverse properties to simplify and perform computations. (05)
08. Identify and use relationships between operations to solve problems. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Lesson 02 - Whole Number Subtraction; Borrowing and Problem Solving**

Math 5 Lesson 02 - Whole Number Subtraction; Borrowing and Problem Solving

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
F. Apply number system properties when performing computations. (05-07)
08. Identify and use relationships between operations to solve problems. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Lesson 03 - Whole Number Multiplication; Properties, 1-Digit and 2-Digit Multiplication, Problem Solving**

Math 5 Lesson 03 - Whole Number Multiplication; Properties, 1-Digit and 2-Digit Multiplication, Problem Solving

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
F. Apply number system properties when performing computations. (05-07)
07. Use commutative, associative, distributive, identity and inverse properties to simplify and perform computations. (05)
08. Identify and use relationships between operations to solve problems. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

**Lesson 04 - Whole Number Division; 1-Digit and 2-Digit Division and Problem Solving**

Math 5 Lesson 04 - Whole Number Division; 1-Digit and 2-Digit Division and Problem Solving

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
F. Apply number system properties when performing computations. (05-07)
08. Identify and use relationships between operations to solve problems. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Lesson 05 - Order of Operations, Perfect Squares, Square Roots**

Math 5 Lesson 05 - Order of Operations, Perfect Squares, Square Roots

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
E. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results. (05-07)
09. Use order of operations, including use of parentheses, to simplify numerical expressions. (05)
G. Apply and explain the use of prime factorizations, common factors, and common multiples in problem situations. (05-07)
05. Recognize and identify perfect squares and their roots. (05)

**Lesson 06 - Equivalent Fractions and GCF**

Math 5 Lesson 06 - Equivalent Fractions and GCF

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
B. Compare, order and convert among fractions, decimals and percents. (05-07)
02. Use various forms of "one" to demonstrate the equivalence of fractions; e.g., (05)
03. Identify and generate equivalent forms of fractions, decimals and percents. (05)

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

**Lesson 07 - Adding Fractions with Like Denominators**

Math 5 Lesson 07 - Adding Fractions with Like Denominators

Standard Benchmark and Indicator
S01. Number, Number Sense and Operations
B. Compare, order and convert among fractions, decimals and percents. (05-07)
02. Use various forms of "one" to demonstrate the equivalence of fractions; e.g., (05)
F. Apply number system properties when performing computations. (05-07)
07. Use commutative, associative, distributive, identity and inverse properties to simplify and perform computations. (05)
H. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers. (05-07)
10. Justify why fractions need common denominators to be added or subtracted. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
12. Use physical models, points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals. (05)

**Lesson 08 - Fractions with Unlike Denominators; Adding and Subtracting**

Math 5 Lesson 08 - Fractions with Unlike Denominators; Adding and Subtracting

Standard Benchmark and Indicator
S01. Number, Number Sense and Operations
B. Compare, order and convert among fractions, decimals and percents. (05-07)
02. Use various forms of "one" to demonstrate the equivalence of fractions; e.g., (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
04. Round decimals to a given place value and round fractions (including mixed numbers) to the nearest half. (05)
12. Use physical models, points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals. (05)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

**Lesson 09 - Test Over Lessons One Through Eight**

**Lesson 10 - Adding Mixed Fractions**

Math 5 Lesson 10 - Adding Mixed Fractions

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
B. Compare, order and convert among fractions, decimals and percents. (05-07)
02. Use various forms of "one" to demonstrate the equivalence of fractions; e.g., (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
12. Use physical models, points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals. (05)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Lesson 11 - Subtracting Mixed Fractions**

Math 5 Lesson 11 - Subtracting Mixed Fractions

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
B. Compare, order and convert among fractions, decimals and percents. (05-07)
02. Use various forms of "one" to demonstrate the equivalence of fractions; e.g., (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
12. Use physical models, points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals. (05)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Lesson 12 - Multiplying Fractions and Mixed Fractions**

Math 5 Lesson 12 - Multiplying Fractions and Mixed Fractions

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
F. Apply number system properties when performing computations. (05-07)
08. Identify and use relationships between operations to solve problems. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Lesson 13 - Division of Fractions; Ratios; Listing Outcomes**

Math 5 Lesson 13 - Division of Fractions; Ratios; Listing Outcomes

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
D. Use models and pictures to relate concepts of ratio, proportion and percent. (05-07)
01. Use models and visual representation to develop the concept of ratio as part-to-part and part-to-whole, and the concept of percent as part-to-whole. (05)
F. Apply number system properties when performing computations. (05-07)
08. Identify and use relationships between operations to solve problems. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)
S05. Data Analysis and Probability
H. Find all possible outcomes of simple experiments or problem situations, using methods such as lists, arrays and tree diagrams. (05-07)
07. List and explain all possible outcomes in a given situation. (05)

**Lesson 14 - Decimals: Equivalence, Rounding and Estimating**

Math 5 Lesson 14 - Decimals: Equivalence, Rounding and Estimating

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
B. Compare, order and convert among fractions, decimals and percents. (05-07)
03. Identify and generate equivalent forms of fractions, decimals and percents. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
04. Round decimals to a given place value and round fractions (including mixed numbers) to the nearest half. (05)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

**Lesson 15 - Decimals: Add, Subtract, Compare, Place Value**

Math 5 Lesson 15 - Decimals: Add, Subtract, Compare, Place Value

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
H. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers. (05-07)
11. Explain how place value is related to addition and subtraction of decimals; e.g., $0.2 + 0.14$ ; the two tenths is added to the one tenth because they are both tenths. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
12. Use physical models, points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals. (05)

**Lesson 16 - Multiplying Decimals and Exploring Patterns**

Math 5 Lesson 16 - Multiplying Decimals and Exploring Patterns

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)
S04. Patterns, Functions and Algebra
A. Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications. (05-07)
01. Justify a general rule for a pattern or a function by using physical materials, visual representations, words, tables or graphs. (05)
02. Use calculators or computers to develop patterns, and generalize them using tables and graphs. (05)
B. Represent, analyze and generalize a variety of patterns and functions with

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

tables, graphs, words and symbolic rules. (05-07)
03. Use variables as unknown quantities in general rules when describing patterns and other relationships. (05)

**Lesson 17 - Division of Decimals; Percents, Fractions, and Decimals**

Math 5 Lesson 17 - Division of Decimals; Percents, Fractions, and Decimals

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
B. Compare, order and convert among fractions, decimals and percents. (05-07)
03. Identify and generate equivalent forms of fractions, decimals and percents. (05)
D. Use models and pictures to relate concepts of ratio, proportion and percent. (05-07)
01. Use models and visual representation to develop the concept of ratio as part-to-part and part-to-whole, and the concept of percent as part-to-whole. (05)
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents. (05-07)
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies. (05)

**Lesson 18 - First Semester Test**

**Lesson 19 - Measurement: Customary Units**

Math 5 Lesson 19 - Measurement: Customary Units

<b>Standard Benchmark and Indicator</b>
S02. Measurement
B. Convert units of length, area, volume, mass and time within the same measurement system. (05-07)
05. Make conversions within the same measurement system while performing computations. (05)

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

**Lesson 20 - Measurement: Metric System**

Math 5 Lesson 20 - Measurement: Metric System

<b>Standard Benchmark and Indicator</b>
S02. Measurement
B. Convert units of length, area, volume, mass and time within the same measurement system. (05-07)
05. Make conversions within the same measurement system while performing computations. (05)

**Lesson 21 - Metric System: Weight and Capacity**

Math 5 Lesson 21 - Metric System: Weight and Capacity

<b>Standard Benchmark and Indicator</b>
S02. Measurement
B. Convert units of length, area, volume, mass and time within the same measurement system. (05-07)
05. Make conversions within the same measurement system while performing computations. (05)

**Lesson 22 – Angles**

Math 5 Lesson 22 - Angles

<b>Standard Benchmark and Indicator</b>
S02. Measurement
A. Select appropriate units to measure angles, circumference, surface area, mass and volume, using: (05-07)
01. Identify and select appropriate units to measure angles; i.e., degrees. (05)
C. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders. (05-07)
07. Use benchmark angles (e.g.; 45 (05)
S03. Geometry and Spatial Sense
A. Identify and label angle parts and the regions defined within the plane where the angle resides. (05-07)
03. Label vertex, rays, interior and exterior for an angle. (05)
D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties. (05-07)

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

07. Understand that the measure of an angle is determined by the degree of rotation of an angle side rather than the length of either side. (05)
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**Lesson 23 - Understanding Geometric Concepts**

Math 5 Lesson 23 - Understanding Geometric Concepts

Standard Benchmark and Indicator
S02. Measurement
E. Use problem solving techniques and technology as needed to solve problems involving length, weight, perimeter, area, volume, time and temperature. (05-07)
02. Identify paths between points on a grid or coordinate plane and compare the lengths of the paths; e.g., shortest path, paths of equal length. (05)
S03. Geometry and Spatial Sense
A. Identify and label angle parts and the regions defined within the plane where the angle resides. (05-07)
02. Use standard language to describe line, segment, ray, angle, skew, parallel and perpendicular. (05)
D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties. (05-07)
05. Use physical models to determine the sum of the interior angles of triangles and quadrilaterals. (05)
F. Describe and use the concepts of congruence, similarity and symmetry to solve problems. (05-07)
04. Describe and use properties of congruent figures to solve problems. (05)

**Lesson 24 - Measure Units and Perimeter**

Math 5 Lesson 24 - Measure Units and Perimeter

Standard Benchmark and Indicator
S02. Measurement
C. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders. (05-07)
06. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms. (05)
G. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes. (05-07)
04. Demonstrate understanding of the differences among linear units, square units and cubic units. (05)

**Lesson 25 – Area**

Math 5 Lesson 25 - Area

Standard Benchmark and Indicator
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**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

C. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders. (05-07)

06. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms. (05)

### **Lesson 26 - Circles and Circumference**

Math 5 Lesson 26 - Circles and Circumference

#### **Standard Benchmark and Indicator**

S03. Geometry and Spatial Sense

B. Draw circles, and identify and determine the relationships among the radius, diameter, center and circumference. (05-07)

01. Draw circles, and identify and determine relationships among the radius, diameter, center and circumference; e.g., radius is half the diameter, the ratio of the circumference of a circle to its diameter is an approximation of (05)

### **Lesson 27 - Test Over Lessons Nineteen Through Twenty-Six**

### **Lesson 28 – Solids**

Math 5 Lesson 28 - Solids

#### **Standard Benchmark and Indicator**

S02. Measurement

G. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes. (05-07)

03. Demonstrate and describe the differences between covering the faces (surface area) and filling the interior (volume) of three-dimensional objects. (05)

S03. Geometry and Spatial Sense

I. Identify and draw three-dimensional objects from different views (top, side, front and perspective). (05-07)

08. Predict what three-dimensional object will result from folding a two-dimensional net, then confirm the prediction by folding the net. (05)

### **Lesson 29 - Negative Numbers and Coordinate Graphing**

Math 5 Lesson 29 - Negative Numbers and Coordinate Graphing

#### **Standard Benchmark and Indicator**

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

A. Represent and compare numbers less than 0 through familiar applications and extending the number line. (05-07)
06. Represent and compare numbers less than 0 by extending the number line and using familiar applications; e.g., temperature, owing money. (05)
<b>S03. Geometry and Spatial Sense</b>
C. Specify locations and plot ordered pairs on a coordinate plane. (05-07)
06. Extend understanding of coordinate system to include points whose (05)

**Lesson 30 - Collecting, Analyzing, and Graphing Data**

Math 5 Lesson 30 - Collecting, Analyzing, and Graphing Data

<b>Standard Benchmark and Indicator</b>
<b>S05. Data Analysis and Probability</b>
C. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings. (05-07)
05. Modify initial conclusions, propose and justify new interpretations and predictions as additional data are collected. (05)
E. Collect, organize, display and interpret data for a specific purpose or need. (05-07)
02. Select and use a graph that is appropriate for the type of data to be displayed; e.g., numerical vs. categorical data, discrete vs. continuous data. (05)
04. Determine appropriate data to be collected to answer questions posed by students or teacher, collect and display data, and clearly communicate findings. (05)

**Lesson 31 - Central Measures of Tendency and Constructing Graphs**

Math 5 Lesson 31 - Central Measures of Tendency and Constructing Graphs

<b>Standard Benchmark and Indicator</b>
<b>S05. Data Analysis and Probability</b>
A. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate. (05-07)
01. Read, construct and interpret frequency tables, circle graphs and line graphs. (05)
F. Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data. (05-07)
06. Determine and use the range, mean, median and mode, and explain what each does and does not indicate about the set of data. (05)

**Lesson 32 - Constructing a Circle Graph and Analyzing Complex Graphs**

Math 5 Lesson 32 - Constructing a Circle Graph and Analyzing Complex Graphs

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

<b>Standard Benchmark and Indicator</b>
S05. Data Analysis and Probability
A. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate. (05-07)
01. Read, construct and interpret frequency tables, circle graphs and line graphs. (05)
D. Compare increasingly complex displays of data, such as multiple sets of data on the same graph. (05-07)
03. Read and interpret increasingly complex displays of data, such as double bar graphs. (05)

**Lesson 33 - Math Predictions with Data and Examining Rate of Change**

Math 5 Lesson 33 - Math Predictions with Data and Examining Rate of Change

<b>Standard Benchmark and Indicator</b>
S04. Patterns, Functions and Algebra
K. Graph linear equations and inequalities. (05-07)
05. Model problems with physical materials and visual representations, and use models, graphs and tables to draw conclusions and make predictions. (05)
L. Analyze functional relationships, and explain how a change in one quantity results in a change in the other. (05-07)
06. Describe how the quantitative change in a variable affects the value of a related variable; e.g., describe how the rate of growth varies over time, based upon data in a table or graph. (05)

**Lesson 34 – Probability**

Math 5 Lesson 34 - Probability

<b>Standard Benchmark and Indicator</b>
I. Describe the probability of an event using ratios, including fractional notation.
08. Identify the probability of events within a simple experiment, such as three
09. Use 0, 1 and ratios between 0 and 1 to represent the probability of outcomes
J. Compare experimental and theoretical results for a variety of simple
10. Compare what should happen (theoretical/expected results) with what did
K. Make and justify predictions based on experimental and theoretical

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

probabilities. (05-07)
11. Make predictions based on experimental and theoretical probabilities. (05)

**Lesson 35 - Fractions, Decimals, and Percents**

Math 5 Lesson 35 - Fractions, Decimals, and Percents

<b>Standard Benchmark and Indicator</b>
S01. Number, Number Sense and Operations
B. Compare, order and convert among fractions, decimals and percents. (05-07)
03. Identify and generate equivalent forms of fractions, decimals and percents. (05)

**Lesson 36 – Final Exam**

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**

**Virtual Learning Academy**  
**Jefferson County Educational Service Center**  
**Academic Content Standards**  
**Math 05**