

Mathematics Instructional Framework



KENTUCKY SKILLS U INSTRUCTIONAL FRAMEWORK SERIES INTRODUCTION

IMPETUS FOR FRAMEWORKS

The Kentucky Skills U Instructional Framework Series was designed to provide a common instructional foundation for all of Kentucky’s adult education providers. Local adult educators (who intuitively aligned instruction with college and career readiness standards, student assessment criteria, and program performance metrics) provided the impetus for this project. (In an effort to acknowledge those who inspired this work, contributions of individual Kentucky Adult Educators are signified with a pink highlight throughout the entire framework series.)

Building upon the work done by local providers, a state-level team designed the KY Skills U Instructional Framework Series to align all instruction statewide with the LINC Professional Development Center State Leadership Self-Assessment Tool, the LINC Adult Education Teacher Competencies, the Data Recognition Corporation TABE 11/12 Blueprints, and the GED® Testing Service High Impact Indicators (HIIs). The result is a four-framework series comprised of:

- **The Student Framework** – Research and strategies targeted to adult student retention and persistence, aligned with LINC AE Teacher Competencies
- **The Mathematics Instructional Framework** – Instructional resources aligned with TABE 11/12 levels and GED® HIIs
- **The Reasoning Through Language Arts Instructional Framework** – Instructional resources aligned with TABE 11/12 levels and GED® HIIs
- **The Instructional Technology Framework** – Instructional resources, accompanied by detailed screenshot and video tutorials, aligned with LINC AE Teacher Competencies

INTENDED USES OF FRAMEWORKS

The KY Skills U Instructional Framework Series **provides comprehensive, assessment-aligned instructional support to adult educators**. The frameworks serve as the basis for intensive, ongoing, job-embedded professional learning in the form of provider-based professional learning communities and targeted, framework-aligned, online professional learning elective courses. The four frameworks also:

- Arm instructional leaders with research-based instructional coaching resources
- Equip providers with relevant instructional technology and distance learning tools to support instruction
- Orient providers with best practice strategies for understanding, recruiting, and retaining adult students
- Prepare volunteer tutors with high-quality instructional resources to support learners

INFORMATION FOR NAVIGATING FRAMEWORKS SUCCESSFULLY

To ensure quick and easy access to resources featured in the frameworks, resources have been color coded, as shown below:

KY Skills U Lesson Bank Lesson (yellow highlight)

Network Resources Open College & Career (NROC) Playlist (light grey highlight)

Open Educational Resource (OER) (no highlight)

Kentucky Skills U Educator Model Lesson Segment (pink highlight)

| | |
|--------|------------------------------------|
| Videos | *Must download for optimal quality |
|--------|------------------------------------|

TABE 11/12 ACCEPTABLE SCORE RANGES

| TEST LEVEL | GRADE LEVEL RANGE | MATH | READING | LANGUAGE |
|----------------------|--|-----------|-----------|-----------|
| L (LIMITED LITERACY) | K - 3 RD GRADE | 300 - 489 | 300 - 498 | 300 - 507 |
| E (EASY) | 1 ST - 5 TH GRADE | 376 - 530 | 389 - 533 | 358 - 544 |
| M (MEDIUM) | 2 ND - 8 TH GRADE | 454 - 589 | 443 - 572 | 460 - 580 |
| D (DIFFICULT) | 4 TH - 10 TH GRADE | 502 - 654 | 504 - 615 | 515 - 625 |
| A (ADVANCED) | 7 TH - 12 TH GRADE | 541 - 800 | 540 - 800 | 552 - 800 |



MATHEMATICS INSTRUCTIONAL FRAMEWORK

Kentucky Skills U, in conjunction with the Morehead State University Adult Education Academy, is pleased to present this content framework for mathematics. In the framework, instructional materials from the [Kentucky Skills U Lesson Bank](#), NROC Hippocampus, and Open Education Resources have been aligned with both the Data Recognition Corporation (DRC) [TABE 11/12 Blueprints](#) and the GED® Testing Service [GED® High Impact Indicators](#).

[College and Career Readiness Standards for Adult Education](#) mathematical domain references:

| | |
|---|--|
| NBT: Number and Operations in Base Ten (K-5) | A.SSE: Algebra: Seeing Structure in Expressions |
| NS: The Number System (6-8) | A.APR: Algebra: Arithmetic with Polynomials and Rational Expressions |
| NF: Number and Operations-Fractions (3-5) | A.CED: Algebra: Creating Equations |
| RP: Ratios and Proportional Relationships (6-7) | A.REI: Algebra: Reasoning with Equations and Inequalities |
| OA: Operations and Algebraic Thinking (K-5) | F.IF: Functions: Interpreting Functions |
| EE: Expressions and Equations (6-8) | F.BF: Functions: Building Functions |
| F: Functions (8) | F.LE: Functions: Linear, Quadratic, and Exponential Models |
| G: Geometry (K-8) | G.CO: Geometry: Congruence |
| MD: Measurement and Data (K-5) | G.SRT: Geometry: Similarity, Right Triangles, and Trigonometry |
| SP: Statistics and Probability (6-8) | G.GMD: Geometry: Geometric Measurement and Dimension |
| N.RN: The Real Number System | G.MG: Geometry: Modeling with Geometry |
| N.Q: Number and Quantity | S.ID: Statistics and Probability: Interpreting Categorical and Quantitative Data |

The citation at the end of each standard identifies the CCRS grade, domain, and standard number (or standard number and letter, where applicable). So, 6.NS.6a, for example, stands for Grade 6, Number Sense domain, Standard 6a, and 5.OA.2 stands for Grade 5, Operations and Algebraic Thinking domain, Standard 2.

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 HIGH EMPHASIS LEVEL

[Click Here to View the Entire Kentucky Skills U Hippocampus Mathematics Playlists](#)

LEVEL L High Emphasis

| LEVEL L (AE-CCR LEVEL A) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|---|--|
| NUMBER AND OPERATIONS IN BASE TEN (40%) | 1.NBT.2 | Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: (1.NBT.2.a, 1.NBT.2.b, 1.NBT.2.c) | Place Value: Ones and Tens Whole Numbers Playlist |
| | 1.NBT.3 | Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$. | Place Value: Ones and Tens Comparing Two Digit Numbers Playlist |
| OPERATIONS AND ALGEBRAIC THINKING (38%) | 1.OA.3 | Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.) | Comparing Numbers Properties of Operations Playlist |
| | 1.OA.7 | Understand the meaning of the equal sign and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$. | Is It Equal? Understanding Equality Playlist |
| GEOMETRY (11%) | | No High Emphasis Questions in this Category | |
| MEASUREMENT AND DATA (11%) | 1.MD.4 | Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. | Let's Sort It Out Understanding and Interpreting Data Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 HIGH EMPHASIS LEVEL

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LEVEL E High Emphasis

| LEVEL E (AE-CCR LEVEL B) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|--|---|
| NUMBER AND OPERATIONS IN BASE TEN (28%) | | No High Emphasis Questions in this Category | |
| NUMBER AND OPERATIONS- FRACTIONS (12%) | 3.NF.3 | Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. (3.NF.3.a, 3.NF.3.b, 3.NF.3.c, 3.NF.3.d) | Absolutely Equivalent Fractions Is This the Same? Equivalent Fractions It's All in the Game: Fractions Comparing Fractions Playlist |
| OPERATIONS AND ALGEBRAIC THINKING (22%) | | No High Emphasis Questions in this Category | |
| GEOMETRY (10%) | | No High Emphasis Questions in this Category | |
| MEASUREMENT AND DATA (28%) | 3.MD.7 | Relate area to the operations of multiplication and addition. (3.MD.7.a, 3.MD.7.b, 3.MD.7.c, 3.MD.7.d) | Three-Dimensional Shapes: Area and Nets Composite Shapes Two-Dimensional Shapes: Area and Perimeter Order by Size What's My Area? Using Nets for Finding Surface Area Understanding Area Playlist |

LEVEL M High Emphasis

| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|---|-----------|
| MEASUREMENT AND DATA (15%) | | No High Emphasis Questions in this Category | |
| NUMBER AND OPERATIONS- FRACTIONS (20%) | | No High Emphasis Questions in this Category | |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 HIGH EMPHASIS LEVEL

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| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|---|-----------|
| STATISTICS AND PROBABILITY (5%) | | No High Emphasis Questions in this Category | |
| NUMBER AND OPERATIONS IN BASE TEN (15%) | | No High Emphasis Questions in this Category | |
| OPERATIONS AND ALGEBRAIC THINKING (10%) | | No High Emphasis Questions in this Category | |
| GEOMETRY (10%) | | No High Emphasis Questions in this Category | |
| EXPRESSIONS AND EQUATIONS (15%) | | No High Emphasis Questions in this Category | |
| RATIOS & PROPORTIONAL RELATIONSHIPS (3%) | | No High Emphasis Questions in this Category | |
| THE NUMBER SYSTEM (5%) | | No High Emphasis Questions in this Category | |

LEVEL D High Emphasis

| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---------------------------------|----------|--|--|
| GEOMETRY (18%) | | No High Emphasis Questions in this Category | |
| EXPRESSIONS AND EQUATIONS (18%) | 7.EE.4 | Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities. (7.EE.4a, 7.EE.4.b) | Using Proportion to Solve Direct and Inverse Variation Calculating Perimeter and Area of Rectangle Equations for Trade Jobs Hospital Beds, Nurse's Aides, and the Future Math Skills for Carpet & Tile Installation Ohm's Law: Equations for Electricians Understanding Variables Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 HIGH EMPHASIS LEVEL

[Click Here to View the Entire Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|---|--|
| | | | Newton's Laws, Part 1 Newton's Laws, Part 2 |
| RATIOS AND PROPORTIONAL RELATIONSHIPS (10%) | 7.RP.2 | Recognize and represent proportional relationships between quantities. (7.RP.2.a, 7.RP.2.b, 7.RP.2.c, 7.RP.2.d) | Rate Understanding Proportional Relationships Playlist |
| STATISTICS AND PROBABILITY (22%) | | No High Emphasis Questions in this Category | |
| THE NUMBER SYSTEM (21%) | 7.NS.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. (7.NS.1.a, 7.NS.1.b, 7.NS.1.c, 7.NS.1.d) | Add and Subtract Integers Adding Integers Checkbook Integers Combining Operations Grid and Battleship Introduction to Signed Numbers Positive and Negative Numbers Adding and Subtracting Rational Numbers Playlist |
| FUNCTIONS (11%) | 8.F.5 | Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. | How Steep Is It? Introduction to Functions Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 HIGH EMPHASIS LEVEL

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LEVEL A High Emphasis

| LEVEL A (AE-CCR LEVEL E) | DOMAIN | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|---|----------|---|---|
| GEOMETRY (15%) | G.GMD: Geometric Measurement and Dimension | G.GMD.3 | Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. | Volume Playlist |
| NUMBERS AND QUANTITY (13%) | N.Q: Quantities | N.Q.1 | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. | Units Playlist |
| ALGEBRA (28%) | A.REI: Reasoning with Equations and Inequalities | A.REI.10 | Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). | Two Variable Graphs Playlist |
| FUNCTIONS (28%) | F.IF: Interpreting Functions | F.IF.7 | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. | The Consumer Price Index: Calculating Change Functions Playlist |
| STATISTICS AND PROBABILITY (16%) | S.ID: Interpreting Categorical and Quantitative Data | | No High Emphasis Questions in this Category | |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

LEVEL L Medium Emphasis

| LEVEL L (AE-CCR LEVEL A) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|---|---|
| NUMBER AND OPERATIONS IN BASE TEN (40%) | 1.NBT.5 | Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. | Mental Math: Comparing Numbers Place Value: Ones and Tens Adding and Subtracting 10 to a Number Playlist |
| | 1.NBT.6 | Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. | Mental Math: Comparing Numbers Place Value: Ones and Tens Subtracting Multiples of 10 Playlist |
| OPERATIONS AND ALGEBRAIC THINKING (38%) | 1.OA.4 | Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8. | Counting and Grouping to Add/Subtract Relating Subtracting to Addition Playlist |
| | 1.OA.6 | Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$). | Counting and Grouping to Add/Subtract Addition and Subtraction Strategies Playlist |
| GEOMETRY (11%) | 1.G.2 | Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. | Composite Shapes Composite Shapes Lesson 1 Practice with Composites Creating Composite Shapes Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL L (AE-CCR LEVEL A) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|----------|--|--|
| | K.G.4 | Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/corners) and other attributes (e.g., having sides of equal length). | Composite Shapes Composite Shapes Lesson 1 Practice with Composites Comparing Shapes Playlist |
| MEASUREMENT AND DATA (11%) | | No Medium Emphasis Questions in this Category | |

LEVEL E Medium Emphasis

| LEVEL E (AE-CCR LEVEL B) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|---|---|
| NUMBER AND OPERATIONS IN BASE TEN (28%) | 3.NBT.1 | Use place value understanding to round whole numbers to the nearest 10 or 100. | Rounding Rounding Whole Numbers Playlist |
| | 2.NBT.2 | Count within 1000; skip-count by 5s, 10s, and 100s. | Counting and Regrouping to Add/Subtract Rounding Time Counting within 1000 Playlist |
| | 3.NBT.3 | Multiply one-digit whole numbers by multiples of 10 in the range 10 - 90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations. | Counting and Regrouping to Add/Subtract Rounding Time Multiplying by Multiples of 10 Playlist |
| | 2.NBT.4 | Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons. | Rounding Comparing Numbers Comparing 3-digit Numbers Playlist |
| | 2.NBT.6 | Add up to four two-digit numbers using strategies based on place value and properties of operations. | Rounding Addition Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL E (AE-CCR LEVEL B) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|--|---|
| | 2.NBT.7 | Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. | Whole Number Operations Addition and Subtraction Playlist |
| NUMBER AND OPERATIONS— FRACTIONS (12%) | 3.NF.1 | Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$. | Line 'Em Up! Divide It Up! Introduction to Fractions Playlist |
| | 3.NF.2 | Understand a fraction as a number on the number line; represent fractions on a number line diagram. (3.NF.2.a, 3.NF.2.b) | Line 'Em Up! Divide It Up! Fractions on a Number Line Playlist |
| OPERATIONS AND ALGEBRAIC THINKING (22%) | 2.OA.1 | Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. | Addition and Subtraction Word Problems Playlist |
| | 3.OA.1 | Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 . | Word Problem Strategies Introduction to Multiplication Playlist |
| | 3.OA.6 | Understand division as an unknown-factor problem. For example, find $32/8$ by finding the number that makes 32 when multiplied by 8. | It's Party Time! Introduction to Division Playlist |
| | 3.OA.8 | Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Word Problem Operations: Two Step Problems Two-step Word Problems Using the Four Operations Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL E (AE-CCR LEVEL B) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-------------------------------|----------|--|---|
| GEOMETRY (10%) | 2.G.1 | Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. | The Shape of Things to Come Identify Shapes Given Their Attributes Playlist |
| | 3.G.1 | Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. | The Shape of Things to Come Categories of Shapes Playlist |
| MEASUREMENT AND DATA (28%) | 3.MD.1 | Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. | Rounding Time Time Playlist |
| | 3.MD.2 | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. | Math Medical Unit Conversions Volume of a Rectangular Solid Introduction to Mass and Volume Playlist |
| | 3.MD.8 | Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. | Volume of a Rectangular Solid Real-World Perimeter and Area Introduction to Perimeter and Area Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

LEVEL M Medium Emphasis

| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|---|---|
| MEASUREMENT AND DATA (15%) | 5.MD.1 | Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. | Math Skills for Carpet and Tile Installation Math and Medical Unit Conversions Converting Units of Measurement Playlist |
| | 5.MD.5 | Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. (5.MD.5.a, 5.MD.5.b, 5.MD.5.c) | Divide and Conquer Volume of a Rectangular Solid Volume Playlist |
| | 4.MD.6 | Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. | Measuring Angles Introduction to Angles Playlist |
| | 4.MD.7 | Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure. | Work with Angles Properties of Angles Playlist |
| NUMBER AND OPERATIONS—FRACTIONS (20%) | 4.NF.3 | Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. (4.NF.3.a, 4.NF.3.b, 4.NF.3.c, 4.NF.3.d) | Add and Subtract Fractions Adding Fractions with the Same Denominator Playlist |
| | 4.NF.4 | Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. (4.NF.4.a, 4.NF.4.b, 4.NF.4.c) | Multiply and Divide Fractions The Four Operations with Fractions for Trade Jobs Understanding Fractions Multiply a Fraction by a Whole Number Playlist |
| | 5.NF.4 | Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. | Understanding Fractions Multiply a Fraction by a Fraction Playlist |
| | 4.NF.7 | Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model. | Decimal Sense Comparing Decimals Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|--|--|
| | 5.NF.7 | Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (5.NF.7.a, 5.NF.7.b, 5.NF.7.c) | The Four Operations with Fractions for Trade Jobs Understanding Fractions Dividing Fractions Playlist |
| STATISTICS & PROBABILITY (5%) | 6.SP.1 | Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, How old am I? is not a statistical question, but How old are the students in my school? is a statistical question because one anticipates variability in students' ages. | Statistical Questions Statistical Questions Playlist |
| NUMBER AND OPERATIONS IN BASE TEN (15%) | 4.NBT.1 | Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 / 70 = 10$ by applying concepts of place value and division. | Place Value Division Comparing Place Values Playlist |
| | 5.NBT.3 | Read, write, and compare decimals to thousandths. (5.NBT.3.a, 5.NBT.3.b) | Decimals Comparing Decimals to the Thousandths Playlist |
| OPERATIONS AND ALGEBRAIC THINKING (12%) | 4.OA.1 | Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. | Interpreting and Factoring Multiplication as Comparison Playlist |
| | 4.OA.2 | Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. | Proportions for Trade Jobs Multiplication as Comparison Playlist |
| GEOMETRY (10%) | 4.G.1 | Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. | Locate Points on the Coordinate Plane Measuring Angles Points, Lines, Line Segments, Rays, Angles, and Perpendicular and Parallel Lines Playlist |
| EXPRESSIONS AND EQUATIONS (15%) | | No Medium Emphasis Questions in this Category | |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|--|---|
| RATIOS & PROPORTIONAL RELATIONSHIPS (3%) | 6.RP.2 | Understand the concept of a unit rate a/b associated with a ratio $a:b$ with b not equal to 0, and use rate language in the context of a ratio relationship. For example, this recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar. We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger. | Analyze Proportional Relationships (Scale Factors) Proportional Relationships Ratio and Proportion It's a Bargain Introduction to Ratios and Rates Playlist |
| THE NUMBER SYSTEM (5%) | 6.NS.2 | Fluently divide multi-digit numbers using the standard algorithm | Time Management Division Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

LEVEL D Medium Emphasis

| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|--|--|
| GEOMETRY (18%) | 8.G.2 | Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. | Exponents, Roots, and Scientific Notation Intro to the Pythagorean Theorem Testing for Congruence through Transformations Playlist |
| EXPRESSIONS AND EQUATIONS (18%) | 8.EE.2 | Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. | Square Roots and Cube Roots Playlist |
| RATIOS AND PROPORTIONAL RELATIONSHIPS (10%) | 6.RP.3 | Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (6.RP.3a, 6.RP.3.b, 6.RP.3.c, 6.RP.3.d) | Analyze Proportional Relationships (Scale Factors) Budgeting with Math Calculating Percent in Real-Life Situations Education Pays Finding the Unknown Percent, Part, or Whole for Trade Jobs Introduction to Circles Medical Math and Unit Conversions Percent and Pie Charts Percent Applications Percent Basics Proportions for Trade Jobs Ratio and Proportion: Using a Double Number Line Real-Life Proportions Real-Life Ratios and Rates Three Views of a Ratio: Using Unit Rate Understanding Ratios: Using Ratio Tables Using Proportion to Solve Percent Using Proportion to Solve Direct and Inverse Variation Rates, Ratios, and Proportions Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-------------------------------------|----------|--|--|
| STATISTICS AND PROBABILITY (22%) | 7.SP.4 | Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book. | Measures of Center and Variability Playlist |
| | 7.SP.5 | Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. | Probability Playlist |
| | 7.SP.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. (7.SP.8.a, 7.SP.8.b) | Analyzing Trends Probability of Compound Events Playlist |
| THE NUMBER SYSTEM (21%) | 6.NS.5 | Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. | Absolutely Positive and Negative Numbers Introduction to Integers Playlist |
| | 6.NS.6 | Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. (6.NS.6.a, 6.NS.6.b, 6.NS.6.c) | Multiply and Divide Integers Ordering Integers Playlist |
| | 6.NS.7 | Understand ordering and absolute value of rational numbers. (6.NS.7.a, 6.NS.7.b, 6.NS.7.c, 6.NS.7.d) | Absolutely Absolute Value Playlist |
| | 7.NS.2 | Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. (7.NS.2.a, 7.NS.2.b, 7.NS.2.c, 7.NS.2.d) | Multiply and Divide Integers Multiply and Divide Integers Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|----------|---|--|
| FUNCTIONS (11%) | 8.F.4 | Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. | Linear Functions, Rate of Change, and Slope Playlist |

LEVEL A Medium Emphasis

| LEVEL A (AE-CCR LEVEL E) | DOMAIN/ STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------------|--|---|--|
| GEOMETRY (15%) | G.SRT: Similarity, Right Triangles, and Trigonometry/G.SRT.5 | Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. | Congruent and Similar Triangles Playlist |
| | G.MG: Modeling with Geometry/ G.MG.2 | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). | Calculate Density Playlist |
| NUMBERS AND QUANTITY (13%) | N.RN: The Real Number System/N.RN.2 | Rewrite expressions involving radicals and rational exponents using the properties of exponents. | Properties of Exponents Playlist |
| ALGEBRA (28%) | A.APR: Arithmetic with Polynomials and Rational Expressions/ A.APR.1 | Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add subtract, and multiply polynomials. | Adding Polynomials Factoring Polynomials Subtracting Polynomials Add, Subtract, and Multiply Polynomials Playlist |
| | A.CED: Creating Equations/ A.CED.3 | Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. | Inequalities Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL A (AE-CCR LEVEL E) | DOMAIN/ STANDARD | STANDARD DESCRIPTION | RESOURCES |
|----------------------------------|---|--|--|
| | A: REI: Reasoning with Equations and Inequalities/ A.REI.6 | Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. | Solving Systems of Equations Playlist |
| FUNCTIONS (28%) | F.IF: Interpreting Functions/ F.IF.2 | Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. | Introduction to Functions Playlist |
| | F.IF: Interpreting Functions/ F.IF.4 | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. For example, for a quadratic function modeling a projectile in motion, interpret the intercepts and the vertex of the function in the context of the problem. | Interpreting Functions Playlist |
| | F.IF: Interpreting Functions/ F.IF.6 | Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. | How Steep Is It? Rate of Change of a Function Playlist |
| STATISTICS AND PROBABILITY (16%) | S.ID: Interpreting Categorical and Quantitative Data/S.ID.1 | Represent data with plots on the real number line (dot plots, histograms, and box plots). | Dot Plots, Histograms, and Box Plots Playlist |
| | S.ID: Interpreting Categorical and Quantitative Data/S.ID.3 | Interpreting differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). | Shape, Center, and Spread of Data Playlist |
| | S.ID: Interpreting Categorical and Quantitative Data/S.ID.5 | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. | Two-way Frequency Tables Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 MEDIUM EMPHASIS LEVEL

[Link to All Kentucky Skills U Hippocampus Mathematics Playlists](#)

| LEVEL A (AE-CCR LEVEL E) | DOMAIN/ STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|---|--|---|
| | S.ID: Interpreting Categorical and Quantitative Data/S.ID.7 | Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. | Interpreting the Slope and Intercept Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 LOW EMPHASIS LEVEL

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LEVEL L Low Emphasis

| LEVEL L (AE-CCR LEVEL A) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|--|--|
| NUMBER AND OPERATIONS IN BASE TEN (40%) | 1.NBT.4 | Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. | Addition within 100 Playlist |
| OPERATIONS AND ALGEBRAIC THINKING (38%) | 1.OA.2 | Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. | Addition Word Problems Playlist |
| | 1.OA.5 | Relate counting to addition and subtraction (e.g., by counting on 2 to add 2). | Introduction to Addition and Subtraction Playlist |
| | 1.OA.8 | Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = [\text{box}] - 3$, $6 + 6 = [\text{box}]$. | Mental Math: Comparing Numbers Solving for Unknown Numbers in Addition and Subtraction Equations Playlist |
| GEOMETRY (11%) | | No Low Emphasis Questions in this Category | |
| MEASUREMENT AND DATA (11%) | 1.MD.2 | Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps. | Basic Length Measurement Introduction to Length Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 LOW EMPHASIS LEVEL

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LEVEL E Low Emphasis

| LEVEL E (AE-CCR LEVEL B) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|--|---|
| NUMBER AND OPERATIONS IN BASE TEN (28%) | 2.NBT.1 | Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: (2.NBT.1.a, 2.NBT.1.b) | Comparing Numbers Budgeting with Math Place Value Up to Hundreds Playlist |
| | 3.NBT.2 | Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. | Regrouping Rounding Time Add and Subtract within 1000 Playlist |
| | 2.NBT.3 | Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. | Regrouping Read and Write Numbers to 1000 Playlist |
| NUMBER AND OPERATIONS – FRACTIONS (12%) | | No Low Emphasis Questions in this Category | |
| OPERATIONS AND ALGEBRAIC THINKING (22%) | 3.OA.2 | Interpret whole-number quotients of whole numbers, e.g., interpret $56/8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56/8$. | Understanding Division Playlist |
| | 3.OA.3 | Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. | Word Problem Strategies Multiplication and Division within 100 Playlist |
| | 3.OA.4 | Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \boxed{}/3$, $6 \times 6 = ?$. | Solving for Unknown Numbers in Multiplication and Division Equations Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 LOW EMPHASIS LEVEL

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| LEVEL E (AE-CCR LEVEL B) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|----------|--|---|
| | 3.OA.5 | Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.) | Properties of Multiplication and Division Playlist |
| | 3.OA.7 | Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. | Multiply and Divide within 100 Playlist |
| | 3.OA.9 | Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends. | Patterns Playlist |
| GEOMETRY (10%) | 3.G.2 | Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape. | Composite Shapes Identifying Fractions Playlist |
| | 2.G.3 | Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. | Halves and Thirds and Fourths Playlist |
| MEASUREMENT AND DATA (28%) | 2.MD.2 | Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen. | Basic Length Measurement Estimating Measurement Measuring Length Playlist |
| | 2.MD.3 | Estimate lengths using units of inches, feet, centimeters, and meters. | Estimating Measurement Estimating Length Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 LOW EMPHASIS LEVEL

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| LEVEL E (AE-CCR LEVEL B) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|----------|--|--|
| | 3.MD.3 | Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step how many more and how many less problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets. | What Does the Future Hold? Picture and Bar Graphs Playlist |
| | 2.MD.4 | Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. | Basic Length Measurement Estimating Measurement Make a Ruler Comparing Measurements Playlist |
| | 3.MD.4 | Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units - whole numbers, halves, or quarters. | Make a Ruler Line Plots Playlist |
| | 3.MD.5 | Recognize area as an attribute of plane figures and understand concepts of area measurement. (3.MD.5.b) | Composite Shapes Real-World Area and Perimeter Two-Dimensional Shapes Introduction to Area Playlist |
| | 2.MD.6 | Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram. | Addition and Subtraction on a Number Line Playlist |
| | 2.MD.10 | Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph. | Solving Problems with Bar Graphs Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 LOW EMPHASIS LEVEL

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LEVEL M Low Emphasis

| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|---|---|
| MEASUREMENT AND DATA (15%) | 5.MD.2 | Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally. | Fractions on a Number Line Playlist |
| | 5.MD.4 | Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. | Introduction to Volume Playlist |
| | 4.MD.5 | Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: (5.MD.5.b) | Measuring Angles Angle Measurement Playlist |
| NUMBER AND OPERATIONS—FRACTIONS (20%) | 4.NF.1 | Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{n \times a}{n \times b}$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. | Proportions in Trade Jobs Understanding Fractions Equivalent Fractions Playlist |
| | 5.NF.2 | Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $\frac{2}{5} + \frac{1}{2} = \frac{3}{7}$, by observing that $\frac{3}{7} < \frac{1}{2}$. | Add and Subtract Fractions Fraction Addition and Subtraction Word Problems Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 LOW EMPHASIS LEVEL

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| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|---|--|
| | 5.NF.3 | Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie? | The Four Operations with Fractions for Trade Jobs Fractions as Division Playlist |
| | 5.NF.5 | Interpret multiplication as scaling (resizing), by: (5.NF.5.b) | Multiplication as Scaling Playlist |
| | 5.NF.6 | Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. | Fraction Multiplication Word Problems Playlist |
| STATISTICS & PROBABILITY (5%) | 6.SP.2 | Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. | Mean, Median, Mode, Range What Does the Future Hold? Distribution of Data Playlist |
| | 6.SP.4 | Display numerical data in plots on a number line, including dot plots, histograms, and box plots. | Dot Plots, Histograms, and Box Plots Playlist |
| NUMBER AND OPERATIONS IN BASE TEN (15%) | 4.NBT.3 | Use place value understanding to round multi-digit whole numbers to any place. | Employability Skills Lesson 3 Rounding Whole Numbers Playlist |
| | 4.NBT.4 | Fluently add and subtract multi-digit whole numbers using the standard algorithm. | Employability Skills Lesson 3 Adding and Subtracting Whole Numbers Playlist |
| | 5.NBT.4 | Use place value understanding to round decimals to any place. | Using Proportion to Solve Percent Rounding Decimals Playlist |
| | 4.NBT.5 | Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. | Employability Skills Lesson 3 Multiplication up to Four Digits and Two Two-digits Playlist |
| | 5.NBT.5 | Fluently multiply multi-digit whole numbers using the standard algorithm. | Time Management Multiplying Multi-Digit Numbers Playlist |

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| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|--|----------|--|--|
| | 4.NBT.6 | Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. | It's Party Time! Division with Remainders Playlist |
| | 5.NBT.7 | Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. | Decimals Decimals with All Operations Playlist |
| OPERATIONS AND ALGEBRAIC THINKING (12%) | 5.OA.1 | Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. | Combining Operations Evaluate Expressions with Parenthesis Playlist |
| | 4.OA.3 | Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Word Problem Strategies Multi-step Word Problems Playlist |
| | 4.OA.4 | Find all factor pairs for a whole number in the range 1 - 100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1 - 100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1 - 100 is prime or composite. | Interpreting and Factoring Prime and Composite Numbers Playlist |
| | 4.OA.5 | Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule Add 3 and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way. | Funky Patterns Number Shape Patterns Playlist |

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| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---------------------------------|----------|--|--|
| GEOMETRY (10%) | 5.G.1 | Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.5.G., x-axis and x-coordinate, y-axis and y-coordinate). | Locate Points on the Coordinate Plane Coordinate Plane Playlist |
| | 5.G.3 | Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles. | Shape Attributes Playlist |
| | 6.G.4 | Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. | Three-Dimensional Shapes: Area and Nets Surface Area with Nets Playlist |
| EXPRESSIONS AND EQUATIONS (15%) | 6.EE.7 | Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers. | Solving Addition and Multiplication One-Step Equations Playlist |
| | 6.EE.8 | Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams. | Write and Solve Inequalities Playlist |

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| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|----------|---|---|
| | 6.EE.9 | Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time. | Dependent and Independent Variables Playlist |
| | 6.EE.2 | Write, read, and evaluate expressions in which letters stand for numbers.(6.EE.2.a, 6.EE.2.b, 6.EE.2.c) | Variables Write, Read, and Evaluate Expressions Playlist |
| | 6.EE.3 | Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$. | Equivalent Expressions Playlist |
| | 6.EE.4 | Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for. | Identifying Equivalent Expressions Playlist |
| | 6.EE.5 | Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. | Variables Finding True Equations and Inequalities Playlist |
| | 6.EE.6 | Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. | Variables Write Expressions from Word Problems Playlist |

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| LEVEL M (AE-CCR LEVEL C) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|---|---|
| RATIOS & PROPORTIONAL RELATIONSHIPS (3%) | | No Low Emphasis Questions in this Category | |
| THE NUMBER SYSTEM (5%) | 6.NS.1 | Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$ -cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi? | Multiply and Divide Fractions Division with Fractions Playlist |
| | 6.NS.4 | Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1 - 100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express $36 + 8$ as $4(9 + 2)$. | Greatest Common Factor Playlist |

MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 LOW EMPHASIS LEVEL

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LEVEL D Low Emphasis

| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|----------|---|---|
| GEOMETRY (18%) | 7.G.1 | Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. | Analyze Proportional Relationships (Scale Factors) Profit and Growth Scale Drawings Playlist |
| | 7.G.4 | Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. | Circumference and Area of a Circle Cover This Divide and Conquer Introduction to Circles Talking to the Problem: Questioning Techniques for Geometry Area and Circumference of a Circle Playlist |
| | 8.G.4 | Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. | Profit and Growth Talking to the Problem: Questioning Techniques for Geometry Similar Figures Playlist |
| | 7.G.5 | Use facts about supplementary, complementary, vertical, and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure. | Supplementary, Complementary, Vertical, and Adjacent Angles Playlist |
| | 7.G.6 | Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. | Calculating Perimeter and Area of a Rectangle Divide and Conquer Profit and Growth Talking to the Problem: Questioning Techniques for Geometry Wrap It Up—Part 1 Wrap It Up—Part 2 Area, Volume, and Surface Area of Composite Figures Playlist |
| | 8.G.7 | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. | Pythagorean Theorem: Missing Side Playlist |
| | 8.G.8 | Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. | Pythagorean Theorem: Distance Between Two Points Playlist |

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| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|------------------------------------|----------|--|---|
| EXPRESSIONS AND EQUATIONS (18%) | 8.EE.1 | Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1 \div 3^3 = 1/27$. | What's Your Profit? Exponent Properties Playlist |
| | 7.EE.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that increase by 5% is the same as multiply by 1.05. | What's Your Profit? Rewrite Expressions in Different Forms Playlist |
| | 7.EE.3 | Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $1/10$ of her salary an hour, or \$2.50, for a new salary of \$250. If you want to place a towel bar $9 \frac{3}{4}$ inches long in the center of a door that is $27 \frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. | Integer Word Problems Playlist |
| | 8.EE.3 | Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger. | Scientific Notation Playlist |
| | 8.EE.5 | Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. | How Steep Is It? Real Life Proportions Use Graphs to Determine Slope Playlist |
| | 8.EE.8 | Analyze and solve pairs of simultaneous linear equations. (8.EE.8.a, 8.EE.8.b, 8.EE.8.c) | System of Equations Playlist |

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| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|----------|--|---|
| RATIOS AND PROPORTIONAL RELATIONSHIPS (10%) | 7.RP.1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour. | Unit Rates and Fractions Playlist |
| | 7.RP.3 | Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. | Real Life Proportions Multi-Step Ratio and Percent Problems Playlist |
| STATISTICS AND PROBABILITY (22%) | 8.SP.1 | Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. | Scatter Plots Playlist |
| | 7.SP.2 | Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be. | Random Samples Playlist |
| | 8.SP.2 | Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. | Lines of Best Fit Playlist |
| | 8.SP.3 | Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height. | Linear Equations and Intercepts Playlist |

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TABLE 11/12 LOW EMPHASIS LEVEL

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| LEVEL D (AE-CCR LEVEL D) | STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|----------|--|---|
| | 8.SP.4 | Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores? | Two Way Tables Playlist |
| | 6.SP.5 | Summarize numerical data sets in relation to their context, such as by: (6.RP.5.d) | Analyzing Trends What Does the Future Hold? Measures of Center and Variability Playlist |
| | 7.SP.7 | Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (7.SP.7.a, 7.SP.7.b) | Analyzing Trends Employability Skills Lesson 4 Mean, Median, Mode, Range Probability Models Playlist |
| THE NUMBER SYSTEM (21%) | 6.NS.8 | Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. | Location, Location, Location: Navigating the Coordinate Plane Graphing Points on a Coordinate Plane Playlist |
| | 8.NS.2 | Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. | Approximations of Irrational Numbers Playlist |
| FUNCTIONS (11%) | 8.F.3 | Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line. | Funky Equations of the Line Y=MX + B Funky Town Festival Linearity Playlist |

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TABE 11/12 LOW EMPHASIS LEVEL

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LEVEL A Low Emphasis

| LEVEL A (AE-CCR LEVEL E) | DOMAIN/ STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|--|---|--|
| GEOMETRY (15%) | G.CO: Congruence/ G.CO.1 | Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. | Things that are Round Defining Angles, Circles, Perpendicular and Parallel Lines, and Line Segments Playlist |
| | N.Q: Quantities/ N.Q.3 | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. | Using Reasonable Rates Playlist |
| ALGEBRA (28%) | A.SSE: Seeing Structure in Expressions/ A.SSE.1a | Interpret parts of an expression, such as terms, factors, and coefficients. | Parts of an Equation: Terms, Factors, and Coefficients Playlist |
| | A.SSE: Seeing Structure in Expressions/ A.SSE.2 | Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$. | Factoring a Difference of Squares Playlist |
| | A.SSE: Seeing Structure in Expressions/ A.SSE.3a | Factor a quadratic expression to reveal the zeroes of the function it defines. | Roots and Vertex of Quadratic Equations Playlist |
| | A.CED: Creating Equations/ A.CED.1 | Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. | Adding Polynomials Factoring Polynomials Multiply Polynomials Subtracting Polynomials Creating One Variable Equations Playlist |
| | A.CED: Creating Equations/ A.CED.2 | Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | Creating Two Variable Equations Playlist |
| | A.REI: Reasoning with Equations and Inequalities/ A.REI.1 | Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. | Steps to Solve Simple Equations Playlist |
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MATHEMATICS INSTRUCTIONAL FRAMEWORK

TABE 11/12 LOW EMPHASIS LEVEL

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| LEVEL A (AE-CCR LEVEL E) | DOMAIN/ STANDARD | STANDARD DESCRIPTION | RESOURCES |
|-----------------------------|---|---|--|
| | A.REI: Reasoning with Equations and Inequalities/ A.REI.3 | Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | Solving Linear Equations and Inequalities Playlist |
| | A.REI: Reasoning with Equations and Inequalities/ A.REI.4 | Solve quadratic equations in one variable. | Solve Quadratic Equations Playlist |
| FUNCTIONS (28%) | F.IF: Interpreting Functions/ F.IF.1 | Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$. | Domain and Range of a Function Playlist |
| | F.IF: Interpreting Functions/ F.IF.8b | Use properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in an exponential function and then classify it as representing exponential growth or decay. | Exponential Growth Playlist |
| | F.IF: Interpreting Functions/ F.IF.9 | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. | Comparing Linear Functions Playlist |
| | F.BF: Building Functions/ .BF.1 | Write a function that describes a relationship between two quantities. | Two Variable Functions Playlist |
| | F.LE: Linear, Quadratic, and Exponential Models/ F.LE.1c | Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. | Percent Growth Playlist |
| | F.LE: Linear, Quadratic, and Exponential Models/ F.LE.5 | Interpret the parameters in a linear or exponential function in terms of a context. | Understanding Linear and Exponential Models Playlist |

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| LEVEL A (AE-CCR LEVEL E) | DOMAIN/ STANDARD | STANDARD DESCRIPTION | RESOURCES |
|---|--|--|---|
| STATISTICS AND PROBABILITY (16%) | S.ID: Interpreting Categorical and Quantitative Data/S.ID.9 | Distinguish between correlation and causation. | Correlations and Causation Playlist |

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| GED® High Impact Indicator | College and Career Readiness Standard | Correlating Lessons, Playlists, and Open Educational Resources |
|---|---|--|
| Q.1 Apply number sense concepts, including ordering rational numbers, absolute value, multiples, factors, and exponents | | |
| Q.1.a Order fractions and decimals, including ordering on a number line. | <p>4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model. (Level C-Fractions)</p> <p>6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. (Level D-Number Systems)</p> <p>6.NS.7 Understand ordering and absolute value of rational numbers. (Level D-Number Systems)</p> | <p>CCR Levels B-C/NRS Levels 2-3 Equivalent Fractions</p> <p>CCR Levels C-D/NRS Levels 3-4 Locate Points in the Coordinate Plane Location, Location, Location: Navigating in the Coordinate Plane</p> <p>CCR Level D/NRS Level 4 Absolutely Add and Subtract Integers Adding Integers Checkbook Integers Converting Fractions to Decimals and Decimals to Fractions Grid and Battleship Introduction to Signed Numbers Mean, Median, Mode, Range Oxygen Needs by the Numbers Positive and Negative Numbers</p> <p>Ordering Fractions and Decimals Playlist</p> |
| Q.1.b Apply number properties involving multiples and factors, such as using the least common multiple, greatest common factor, or distributive property to rewrite numeric expressions. | 6.NS.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. (Level C-Number Base Ten) | <p>LCM and the Distributive Property Playlist</p> |

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| Q.1.c Apply rules of exponents in numerical expressions with rational exponents to write equivalent expressions with rational exponents. | 8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. <i>For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.</i> (Level D-Expressions and Equations) | CCR Level D/NRS Level 4 Exponents, Roots, and Scientific Notation Rules of Exponents Playlist |
| Q.1.d Identify absolute value or a rational number as its distance from 0 on the number line and determine the distance between two rational numbers on the number line, including using the absolute value of their difference. | 7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. (Level D-Number Systems) 7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. (Level D-Number Systems) | CCR Level D/NRS Level 4 Add and Subtract Integers Adding Integers Checkbook Integers Combining Operations Grid and Battleship Introduction to Signed Numbers Positive and Negative Numbers |
| Q.3 Calculate and use ratios, percents and scale factors | | |
| Q.3.a Compute unit rates. Examples include (but are not limited to): unit pricing, constant speed, people per square mile, BTUs per cubic foot. | 6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (Level D-Ratio and Proportional Reasoning) 6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (Level C-Fractions) | CCR Level C/NRS Level 3 Time Management CCR Levels C-D/NRS Levels 3-4 Ratio and Proportion Ratio and Proportion – Using a Double Number Line Three Views of a Ratio: Using Unit Rate Understanding Ratios: Using Ratio Tables Unit Rates Playlist |

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|---|--|---|
| <p>Q.3.b Use scale factors to determine the magnitude of a size change. Convert between actual drawings and scale drawings.</p> | <p>7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. (Level D-Geometry)</p> | <p>CCR Levels C-D/NRS Levels 3-4 Analyze Proportional Relationships (Scale Factors) Event Planning Unit: Using Parts, Percents, and Wholes Profit and Growth Scale Drawings Playlist</p> |
| <p>Q.3.c Solve multi-step real-world arithmetic problems using ratios or proportions including those that require converting units of measure.</p> | <p>6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (Level D-Ratio and Proportional Reasoning) 7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. (Level D-Ratio and Proportional Reasoning) 7.RP.2 Recognize and represent proportional relationships between quantities. (Level D-Ratio and Proportional Reasoning) 7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. (Level D-Ratio and Proportional Reasoning)</p> | <p>CCR Levels C-D/NRS Levels 3-4 Percents and Pie Charts Proportional Relationships Ratio and Proportion – Using a Double Number Line Real-Life Ratios and Rates Understanding Ratios: Using Ratio Tables What's Your Profit?</p> <p>CCR Level D/NRS Level 4 Budgeting with Math Calculating Percent in Real-Life Situation Education Pays Proportional Relationships Math and Unit Conversions Oxygen Needs by the Numbers Proportions for Trade Jobs Real-Life Proportions Proportion Word Problems Playlist</p> |

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| <p>Q.3.d Solve two-step real-world arithmetic problems involving percentages. Examples include (but are not limited to): simple interest, tax, markups and markdowns, gratuities and commissions, percent increase or decrease.</p> | <p>7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. (Level D-Ratio and Proportional Reasoning)</p> | <p>CCR Level D/NRS Level 4 Calculating Percent in Real-Life Situations Education Pays Finding the Unknown Percent, Part, or Whole for Trade Jobs Percent Applications Percent Word Problems Playlist</p> |
| <p>Q.4 Calculate dimensions, perimeter, circumference, and area of two-dimensional figures</p> | | |
| <p>Q.4.a Compute the area and perimeter of triangles and rectangles. Determine side lengths of triangles and rectangles when given area or perimeter.</p> | <p>7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (Level D-Geometry)</p> | <p>CCR Levels C-D/NRS Levels 3-4 Calculating Perimeter and Area of a Rectangle Circumference and Area of a Circle Cover This (Finding Area) Event Planning Unit: Using Parts, Percents, and Wholes Profit and Growth Area and Perimeter of Triangles and Rectangles Playlist</p> |
| <p>Q.4.b Compute the area and circumference of circles. Determine the radius or diameter when given area or circumference.</p> | <p>7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. (Level D-Geometry)</p> | <p>CCR Levels C-D/NRS Levels 3-4 Circumference and Area of a Circle Cover This (Finding Area) Wrap It Up, Part 1 Wrap It Up, Part 2 CCR Level D/NRS Level 4 Introduction to Circles CCR Levels D-E/NRS Levels 5-6 Divide and Conquer Talking to the Problem: Questioning Techniques for Geometry Circumference and Area of a Circle Playlist</p> |

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| Q.4.c Compute the perimeter of a polygon. Given a geometric formula, compute the area of a polygon. Determine side lengths of the figure when given the perimeter or area. | 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. (Level C-Operations and Algebraic Thinking) 7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (Level D-Geometry) | CCR Levels C-D/NRS Levels 3-4 Math Skills for Carpet & Tile Installation CCR Level E/NRS Level 5 Using Formulas in Real Life (including Geometry formulas) Perimeter and Area of a Polygon Playlist |
| Q.4.d Compute perimeter and area of 2-D composite geometric figures, which could include circles, given geometric formulas as needed. | 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. (Level C-Operations and Algebraic Thinking) 7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (Level D-Geometry) | CCR Levels D-E/NRS Levels 5-6 Divide and Conquer Perimeter and Area of 2-D Composite Geometric Figures Playlist |
| Q.4.e Use the Pythagorean theorem to determine unknown side lengths in a right triangle. | 8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (Level D-Geometry) | CCR Level D/NRS Level 4 Introduction to Pythagorean Theorem Task-Based Pythagoras Pythagorean Theorem Playlist |
| Q.5 Calculate dimensions, surface area, and volume of three-dimensional figures | | |
| Q.5.a When given geometric formulas, compute volume and surface area of regular prisms. Solve for side lengths or height, when given volume or surface area. | 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. (Level C-Operations and Algebraic Thinking) 7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (Level D-Geometry) | CCR Levels C-D/NRS Levels 3-4 Wrap It Up, Part 1 (Note: Part of this lesson covers regular prisms) Volume and Surface Area of Regular Prisms Playlist |
| Q.5.b When given geometric formulas, compute volume and surface area of cylinders. Solve for height, radius, or diameter when given volume or surface area. | 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. (Level C-Operations and Algebraic Thinking) 7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (Level D-Geometry) | CCR Levels C-D/NRS Levels 3-4 Talking to the Problem: Questioning Techniques for Geometry Wrap It Up – Part 2 (Note: Part of this lesson covers surface area of cylinders). Volume and Surface Area of Cylinders Playlist |

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|---|---|--|
| Q.5.c When given geometric formulas, compute volume and surface area of right prisms. Solve for side lengths or height, when given volume or surface area. | 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. (Level C-Operations and Algebraic Thinking) 7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (Level D-Geometry) | CCR Levels C-D/NRS Levels 3-4 Wrap It Up - Part 1 (Note: Part of this lesson covers volume of right prisms) Volume and Surface Area of Right Prisms Playlist |
| Q.5.d When given geometric formulas, compute volume and surface area of right pyramids and cones. Solve for side lengths, height, radius, or diameter when given volume or surface area. | 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. (Level C-Operations and Algebraic Thinking) 7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (Level D-Geometry) | CCR Levels C-D/NRS Levels 3-4 Talking to the Problem: Questioning Techniques for Geometry Wrap It Up – Part 1 (Note: Part of this lesson covers surface area of pyramids) Wrap It Up – Part 2 (Note: Part of this lesson covers surface area of cones) Volume and Surface Area of Right Pyramids and Cones Playlist |
| Q.5.e When given geometric formulas, compute volume and surface area of spheres. Solve for radius or diameter when given the surface area. | 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. (Level C-Operations and Algebraic Thinking) G.GMD.3 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. (Level E-Geometry) | CCR Levels C-D/NRS Levels 3-4 Wrap It Up – Part 1 (Note: Part of this lesson covers volume of spheres) Wrap It Up – Part 2 (Note: Part of this lesson covers surface area of spheres) Volume and Surface Area of Spheres Playlist |
| Q.5.f Compute surface area and volume of composite 3-D geometric figures, given geometric formulas as needed. | 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. (Level C-Operations and Algebraic Thinking) G.GMD.3 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. (Level E-Geometry) | CCR Levels D-E/NRS Levels 4-5 Divide and Conquer Surface Area and Volume of Composite Figures Playlist |

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| A.3 Write, manipulate, solve, and graph linear inequalities | | |
|---|--|---|
| A.3.a Solve linear inequalities in one variable with rational number coefficients. | A-REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (Level E-Algebra) | Solve Linear Inequalities in One Variable Playlist |
| A.3.b Identify or graph the solution to a one variable linear inequality on a number line. | 8.EE.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b . (Level E-Algebra) A-REI.C.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. (Level E-Algebra) | Graphing One Variable Linear Inequalities on a Number Line Playlist |
| | | |
| A.3.c Solve real-world problems involving inequalities. | 7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (Level D-Expressions and Equations) | Real World Problems Involving Inequalities Playlist |
| | | |
| A.3.d Write linear inequalities in one variable to represent context. | 6.EE.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (Level C-Operations and Algebraic Thinking) A-CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (Level E-Algebra) A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (Level E-Algebra) | Writing Linear Inequalities in Context Playlist |
| | | |

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| A.7 Compare, represent, and evaluate functions | | |
|---|--|---|
| A.7.a Compare two different proportional relationships represented in different ways. Examples include but are not limited to: compare a distance-time graph to a distance-time equation to determine which of two moving objects has a greater speed. | 8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. (Level D-Expressions and Equations) | CCR Levels C-D/NRS Levels 3-4 Three Views of a Ratio: Using Unit Rate |
| | | CCR Level D/NRS Level 4 Real-Life Proportions |
| A.7.b Represent or identify a function in a table or graph as having exactly one output (one element in the range) for each input (each element in the domain). | 8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Level D-Functions) F-IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$. (Level E-Functions) | CCR Levels D-E/NRS Levels 4-5 How Steep Is It? Proportional Relationships Playlist |
| | | CCR Levels B-C/NRS Levels 2-3 Funky Functions |
| | | CCR Level D/NRS Level 4 Funky Equations of the Line Funky Patterns |
| | | CCR Levels D-E/NRS Levels 4-5 Funky Town Festival Y=MX + B (Just how FUNKY IS THAT?) |
| A.7.c Evaluate linear and quadratic functions for values in their domain when represented using function notation. | F-IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (Level E-Functions) | Identify a Function Playlist |
| | | Evaluate Functions Using Function Notation Playlist |

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How Steep Is It?