

Davison Community Schools
ADVISORY CURRICULUM COUNCIL
Phase II, April 20, 2015
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4th grade Math (3rd grade CAP)

Course Essential Questions (from Phase I report):

- How do we multiply/divide multi-digit numbers?
- How can we use our understanding of equivalent fractions to aid in addition and subtractions?
- How does mathematics help us in finding patterns and relationships in the real-world?

MAJOR CLUSTERS	- areas of intensive focus, where students need fluent understanding and application of the core concepts.	<i>approximately 70%</i>
SUPPORTING CLUSTERS	- rethinking and linking; areas where some material is being covered, but in a way that applies core understandings.	<i>approximately 20%</i>
ADDITIONAL CLUSTERS	- expose students to other subjects, though at a distinct, level of depth and intensity.	<i>approximately 10%</i>

Tier 3 Vocabulary Words are highlighted in yellow

Unit 1: Numeration

Essential Questions:

- -How does the position of a digit in a number affect its value, and how can the value of digits be used to compare two numbers?
- -In what ways can numbers be composed and decomposed?
- -How does understanding place value help you round?

Essential Understanding:

- -Place value is based on groups of ten and the value of a number is determined by the place of its digits.
- -Whole numbers are read from left to right using the name of the period; commas are used to separate periods.
- - A number can be written using its name, standard, or expanded form.
- - The farther left from the decimal the larger the number.

Curriculum Standards- DOK noted where applicable with Standards

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 $700 \div 70 = 10$ by applying concepts of place value and division. **DOK 1**

4. NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons. **DOK 1**

4. NBT.3 Use place value understanding to round multi-digit whole numbers to any place. **DOK 1**

MP-Make sense of problems and persevere in solving them
 MP-Reason abstractly and quantitatively
 MP-Construct viable arguments and critique the reasoning of others
 MP-Model with mathematics
 MP-Use appropriate tools strategically
MP-Attend to precision
MP-Look for and make use of structure
 MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none">• that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right• any multi-digit number can be rounded to any place using place value• the difference between place and value• commas separate the periods• rounding can be used to estimate reasonable answers for word problems.	<ul style="list-style-type: none">• compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, $<$ symbols to record the results of comparisons• read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form• explain that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right• read and write numbers in standard form, word form, and expanded form up to one million• compare two numbers with digits up to one million and identify whether they are less than, greater than, or equal to another number• identify the place value they are rounding to• round whole numbers by finding the multiple of 10, 100, 1000 and so on closest to a given number• round multi-digit numbers to a given place• explain the rounding process using visuals and or language.

Unit 2: Adding and Subtracting Whole Numbers

<p>Essential Questions:</p> <ul style="list-style-type: none"> • How does understanding place value help you solve multi-digit addition and subtraction problems and how can rounding be used to estimate word problems? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • The standard addition and subtraction algorithms for multi-digit numbers break the calculation into simpler calculations using place value starting with the ones, the tens, and so on.
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Curriculum Standards- DOK noted where applicable with Standards

4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm. **DOK 1**

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LEARNING TARGETS

<p>Knowledge/Content I Know ...</p>	<p>Skills/Processes I Can ...</p>
<ul style="list-style-type: none"> • how to add and subtract whole numbers. 	<ul style="list-style-type: none"> • fluently add and subtract multi-digit whole numbers less than or equal to 1,000,000 using the standard algorithm • use mental math and estimation to determine whether my answer is reasonable. • represent multi-step problems using equations.

Unit 3: Multiplication Meanings and Facts

Essential Questions:

- How do I determine the factors of a number?
- What is the difference between a prime and composite number?
- What are different models for multiplication?
- What are efficient methods for finding products?
- What real-life situations require the use of multiplication?

Essential Understanding:

- Some real-world problems involving joining or separating equal groups or comparisons can be solved using multiplication.
- Repeated addition and arrays involve joining equal groups and are two ways to think about multiplication.
- There are patterns in the products for multiplication facts with factors 2, 5, and 9.
- Two numbers can be multiplied in any order.
- The product of any number and 1 is zero. The product of any number and 1 is that number.
- Information in a problem can often be shown using a picture or diagram and used to understand and solve the problem.
- Some problems can be solved by writing and completing a number sentence or equation.
- Some problems can be solved by identifying elements that repeat in a predictable way.
- There are three different structures for multiplication and division problems: Area/Arrays, Equal Groups, and Comparison, and the unknown
- quantity in multiplication and division situations is represented in three ways: Unknown Product, Group Size Unknown, and Number of
- Groups Unknown.

Curriculum Standards- DOK noted where applicable with Standards

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. **DOK 1,2**

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. **DOK 1,2**

4. OA.3 Solve multi-step 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. **DOK 1,2,3**

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. **DOK 1**

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. **DOK 1**

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MP-Model with mathematics

MP-Use appropriate tools strategically

MP-Attend to precision

MP-Look for and make use of structure

MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none"> • multiplication strategies • how to engage in multiplicative comparison • how to engage in additive comparison • the process for dividing whole numbers including division with remainders • what prime and composite numbers are and examples of them • strategies to determine whether a whole number is prime or composite • how to find factor pairs for any number from 1-100 • a whole number is a multiple of each of its factors • examples of number and shape patterns • how to apply properties to solve problems • how to interpret products of whole numbers • how to solve word problems involving multiplication with equal groups, arrays, and measurement • how to determine unknowns in multiplication equations. 	<ul style="list-style-type: none"> • interpret a multiplication equation as a comparison • represent verbal statements of multiplicative comparisons as multiplication equations • describe multiplicative comparison • describe additive comparison • determine and use a variety of representations to model a problem involving multiplicative comparison • distinguish between multiplicative comparison and additive comparison (repeated addition) • multiply or divide to solve word problems • determine appropriate operations and solve word problems involving multiplicative comparison • represent multi-step word problems using equations with a letter standing for the unknown quantity • interpret multi-step word problems (including problems in which remainders must be interpreted) and determine the appropriate operations to solve • Asses the reasonableness of an answer in solving a multi-step word problem using mental math and estimation strategies (including rounding) • identify all factor pairs for any given number 1-100 • determine if a given whole number (1-100) is a multiple of a given one-digit number • evaluate if a given whole number (1-100) is a prime or composite • identify a number or shape pattern • analyze a pattern to determine features not apparent in the rule • generate a number or shape pattern that follows a given • interpret (discuss) multiplication equations. • check to see if a given whole number is a multiple of numbers one through nine. • show that a whole number is a multiple of its

	<p>factors.</p> <ul style="list-style-type: none">• write a multiplication equation based on given data• determine if a number is a multiple of a given one-digit number.• recognize prime and composite numbers up to 100 by writing the factors of each number.
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Unit 4: Division Meanings and Facts

Essential Questions:

- How are multiplication and division related to each other?
- What are different models for division?
- What are efficient methods for finding quotients?
- How are dividends, divisors, quotients, and remainders related?
- What real-life situations require the use of division?

Essential Understanding:

- Some real-world problems involving joining or separating equal groups or comparisons can be solved using division. Sharing and repeated subtraction involves separating equal groups and is two ways to think about division.
- Multiplication and division have an inverse relationship. The inverse relationship between multiplication and division can be used to find division facts.
- Every division fact has a related multiplicand fact.
- Any number (except 0) divided by itself is equal to 1.
- Any number divided by 1 is that number.
- Zero divided by any number (except 0) is zero.
- Zero cannot be a divisor.
- Information in a problem can often be shown using a picture or diagram and used to understand and solve the problem.
- Some problems can be solved by writing and completing a number sentence or equation.
- There are three different structures for multiplication and division problems: Area/Arrays, Equal Groups, and Comparison, and the unknown quantity in multiplication and division situations is represented in three ways: Unknown Product, Group Size Unknown, and Number of Groups Unknown.

Curriculum Standards- DOK noted where applicable with Standards

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. **DOK 1,2**

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. **DOK 1,2**

MP-Make sense of problems and persevere in solving them

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MP-Model with mathematics

MP-Use appropriate tools strategically

MP-Attend to precision

MP-Look for and make use of structure

MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none">• multiplicative comparison• additive comparison• how to find whole number quotients and remainders with up to four-digit dividends and one-digit divisors	<ul style="list-style-type: none">• describe multiplicative comparison• describe additive comparison• determine and use a variety of representations to model a problem involving multiplicative comparison• distinguish between multiplicative comparison and additive comparison (repeated addition)• multiply or divide to solve word problems• determine appropriate operations and solve word problems involving multiplicative comparison• use the strategies based on place-value, the properties of operations, and/or the relationship between multiplication and division• illustrate and explain the calculation by using written equations, rectangular arrays, and/or area models• show the relationship between multiplication and division using arrays or area models (pictorial) and equations (abstract).• use multiplication and division in 2 or more ways to solve the same problem.

Unit 5: Multiplying by 1 Digit Numbers	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • What are different models for multiplication? • What are efficient methods for finding products? • What real-life situations require the use of multiplication? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • Making an array with place-value blocks provides a way to visualize and find products. • A 2-digit by 1-digit multiplication calculation can be broken into simpler problems: a basic fact and a 1-digit number times a multiple of 10 • There is more than one way to do a mental calculation. • Basic facts and place value patterns can be used to find products when one factor is 10 or 100. • Rounding is one way to estimate products. • Answers to problems should always be checked for reasonableness and this can be done in different ways.
Curriculum Standards- DOK noted where applicable with Standards	
<p>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. DOK 1,2</p>	
<p>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. DOK 1,2</p>	
<p>4.OA.3 Solve multi-step 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. DOK 1,2,3</p>	
<p>4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place. DOK 1</p>	
<p>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. DOK 1,2</p>	
<p>MP-Make sense of problems and persevere in solving them MP-Reason abstractly and quantitatively MP-Construct viable arguments and critique the reasoning of others MP-Model with mathematics MP-Use appropriate tools strategically MP-Attend to precision MP-Look for and make use of structure MP-Look for and express regularity in repeated reasoning</p>	
LEARNING TARGETS	
<p>Knowledge/Content I Know ...</p>	<p>Skills/Processes I Can ...</p>

<ul style="list-style-type: none"> ● multiplication strategies ● how to engage in multiplicative comparison ● how to engage in additive comparison ● the process for dividing whole numbers including division with remainders ● any multi-digit number can be rounded to any place using place value ● strategies to multiply whole numbers based on place value and the properties of operations 	<ul style="list-style-type: none"> ● interpret a multiplication equation as a comparison ● represent verbal statements of multiplicative comparisons as multiplication equations ● describe multiplicative comparison ● describe additive comparison ● determine and use a variety of representations to model a problem involving multiplicative comparison ● distinguish between multiplicative comparison and additive comparison (repeated addition) ● multiply or divide to solve word problems ● determine appropriate operations and solve word problems involving multiplicative comparison ● represent multi-step word problems using equations with a letter standing for the unknown quantity ● interpret multi-step word problems (including problems in which remainders must be interpreted) and determine the appropriate operations to solve ● Assess the reasonableness of an answer in solving a multi-step word problem using mental math and estimation strategies (including rounding) ● multiply a whole number of up to four digits by a one-digit whole number ● multiply two two-digit numbers ● use strategies based on place value and the properties of operations to multiply whole numbers ● illustrate and explain calculations by using written equations, rectangular arrays, and/or area models
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Unit 7: Multiplying by 2 Digit Numbers

<p>Essential Questions:</p> <ul style="list-style-type: none"> • What are different models for multiplication? • What are efficient methods for finding products? • What real-life situations require the use of multiplication? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • Making an array with place-value blocks provides a way to visualize and find products. • Basic facts and place-value patterns can be used to mentally multiply a two-digit number by a multiple of 10 or 100. • Products can be estimated by replacing numbers with the closest multiple of 10 or 100. • Products can be estimated by replacing numbers with other numbers that are close and easy to multiply mentally. • Some problems can be solved by first finding and solving a sub-problem and then using that answer to solve the original problem.
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Curriculum Standards- DOK noted where applicable with Standards

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. **DOK 1,2**

4. OA.3 Solve multi-step 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. **DOK 1,2,3**

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LEARNING TARGETS

Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none"> • strategies to multiply whole numbers based on place value and the properties of operations • how to apply properties to solve problems • how to interpret products of whole numbers • how to solve word problems involving multiplication with equal groups, arrays, and measurement • how to determine unknowns in multiplication equations • how to fluently multiply within 100 • how to multiply 1-digit whole number by multiples of 10 	<ul style="list-style-type: none"> • represent multi-step word problems using equations with a letter standing for the unknown quantity • interpret multi-step word problems (including problems in which remainders must be interpreted) and determine the appropriate operations to solve • Asses the reasonableness of an answer in solving a multi-step word problem using mental math and estimation strategies (including rounding) • use strategies based on place value and the properties of operations to multiply whole

	<p>numbers</p> <ul style="list-style-type: none">• illustrate and explain calculations by using written equations, rectangular arrays, and/or area models
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Unit 8: Dividing by 1 Digit Divisors

<p>Essential Questions:</p> <ul style="list-style-type: none"> • What are different models for multiplication and division? • What are efficient methods for finding products and quotients, and how can place value properties aid computation? • How are dividends, divisors, quotients, and remainders related? • What real-life situations require the use of multiplication or division? • How can a remainder affect the answer in a division word problem? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • Basic facts and place-value patterns can be used to divide multiples of 10 and 100. • The remainder when dividing must be less than the divisor. The nature of the question asked determines how to interpret and use the remainder • Information in a problem can often be shown using a picture or diagram and used to understand and solve the problem. Some problems can be solved by writing and completing a number sentence or equation. • Repeated subtraction situations can be modeled and solved using division. • The standard division algorithm breaks the calculation into simpler calculations using basic facts, place value, the relationship between multiplication and division and estimation.
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Curriculum Standards- DOK noted where applicable with Standards

4. OA.3 Solve multi-step 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. **DOK 1,2,3**

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. **DOK 1,2**

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LEARNING TARGETS

<p>Knowledge/Content I Know ...</p>	<p>Skills/Processes I Can ...</p>
<ul style="list-style-type: none"> • how to apply properties to solve problems • how to interpret quotients of whole numbers • how to solve word problems involving division with equal groups, arrays, and measurement • how to determine unknowns in division 	<ul style="list-style-type: none"> • represent multi-step word problems using equations with a letter standing for the unknown quantity • interpret multi-step word problems (including problems in which remainders must be interpreted) and determine the appropriate

<p>equations</p> <ul style="list-style-type: none">• how to understand division as unknown factor• problems• how to fluently divide within 100	<p>operations to solve</p> <ul style="list-style-type: none">• Asses the reasonableness of an answer in solving a multi-step word problem using mental math and estimation strategies (including rounding)• find whole number quotients and remainders with up to four-digit dividends and one-digit divisors• use the strategies based on place value, the properties of operations, and /or the relationship between multiplication and division• Illustrate and explain the calculation by using written equations, rectangular arrays, and/or area models• divide up to a 2 digit number by a one digit number.• divide up to a 3 digit number by a one digit number.• divide up to a 4 digit number by a one digit number.
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Unit 9: Lines, Angles and Shapes

Essential Questions:

- What are the types of angles and the relationships?
- How are angles applied in the context of a circle?
- How are parallel lines and perpendicular lines used in classifying two-dimensional shapes?
- How are protractors used to measure and aid in drawing angles and triangles?
- How can an addition or subtraction equation be used to solve a missing angle measure when the whole angle has been divided into two angles and only one measurement is given?

Essential Understanding:

- Shapes can be classified by properties of their lines and angles.
- Angles are measured in the context of a central angle of a circle
- Angles are composed of smaller angles.
- Two-dimensional or plane shapes have many properties that make them different from one another.
- Polygons can be described and classified by their sides and angles.

Curriculum Standards- DOK noted where applicable with Standards

4. G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. **DOK 1**

4. G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. **DOK 1,2**

4. G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. **DOK 1**

4. MD.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: **DOK 1**

- a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure angles.
- b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

4. MD.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. **DOK 1**

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. **DOK 1,2**

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LEARNING TARGETS

Knowledge/Content

I Know ...

- characteristics of **acute, obtuse, and right angles**
- the relationship between **parallel** and **perpendicular lines** in two-dimensional figures
- how to classify shapes based on the number and length of sides and
- how to identify the number of **angles**.
- how to compose and decompose polygons to make other polygons.
- that an **angle** is formed from 2 **rays** with a common **endpoint**.
- that an **angle** is a fraction of a circle.
- that an **angle** can be divided into smaller angles.
- that there are **360 degrees** in a circle.
- how to use a **protractor**

Skills/Processes

I Can ...

- analyze two-dimensional figures to identify points, lines, line segments, rays, angles, (right, acute, obtuse), and perpendicular and parallel
- draw 2 dimensional figures (points, line, [perpendicular and parallel], line segments, rays and angles [acute, obtuse, right]).
- classify lines as parallel or perpendicular.
- identify right angles.
- identify right triangles.
- determine a fraction and an angle measurement of a circular arc.
- recognize and explain the angle measurement in terms of degrees within a circle (circle = 360 degrees).
- fluently read and sketch angles using a protractor.
- determine the kind of angle based on the measurement (ex. acute, obtuse, right, straight).
- solve addition and subtraction equations to find unknown angle measurements on a diagram.
- classify two dimensional figures based on parallel or perpendicular lines and sizes of angles.
- classify two dimensional figures based on parallel or perpendicular lines and sizes of angles.
- recognize a line of symmetry as a line across a figure when folded.

Unit 10: Understanding Fractions

<p>Essential Questions:</p> <ul style="list-style-type: none"> • How are fractions composed, decomposed, compared and represented? • Why is it important to identify, label, and compare fractions as representations of equal parts of a whole or of a set? • How are fractions used in problem-solving situations? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • The same fractional amount can be represented by an infinite set of different by equivalent fractions. • If two fractions have the same denominator, the fraction with the greater numerator is the greater fraction. • If two fractions have the same numerator, the fraction with the lesser denominator is the greater fraction. • Ordering 3 or more numbers is similar to comparing 2 numbers because each number must be compared to the other numbers. • The whole number parts sometimes whole numbers or fractions need to be renamed.
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Curriculum Standards- DOK noted where applicable with Standards

4. NF.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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. DOK 1,2,3

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 $1/2$. 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. DOK 1,2,3

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LEARNING TARGETS

<p>Knowledge/Content I Know ...</p>	<p>Skills/Processes I Can ...</p>
<ul style="list-style-type: none"> • how a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$. • how to explain equivalence and compare fractions using visual fraction models • to use $<$, $=$, or $>$ symbols when comparing fractions • to use benchmark fractions such as $1/2$ for comparison purposes • to make comparisons based on parts of the same whole 	<ul style="list-style-type: none"> • identify equivalent fractions with unlike denominators • explain why a/b is equal to $(nxa)/(nxb)$ by using fraction models • use visual fraction models to show why fractions are equivalent • generate equivalent fractions using visual fraction models and explain why they can be called "equivalent" • compare two fractions with different

<ul style="list-style-type: none"> • how to fluently add and subtract whole numbers 	<ul style="list-style-type: none"> • numerators or denominators • justify the results of a comparison of two fractions by using a visual fraction model
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Unit 11: Adding and Subtracting Fractions

<p>Essential Questions:</p> <ul style="list-style-type: none"> • How are mixed numbers added and subtracted? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • Fractions and Mixed Numbers are composed of unit fractions and can be decomposed as a sum of unit fractions. • Models can be used to show different ways of adding and subtracting mixed numbers. • A fractional amount can be decomposed into the sum of fractions in more than one way. • One way to subtract mixed numbers is to subtract the fractional parts and then subtract • A fractional amount can be decomposed into the sum of fractions in more than one way
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Curriculum Standards- DOK noted where applicable with Standards

4. NF.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. **DOK 1,2,3**

- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.
- Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
- Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

MP-Make sense of problems and persevere in solving them
MP-Reason abstractly and quantitatively
MP-Construct viable arguments and critique the reasoning of others
MP-Model with mathematics
MP-Use appropriate tools strategically
MP-Attend to precision
MP-Look for and make use of structure
MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none"> • accumulating unit fractions ($1/b$) results in a fraction (a/b), where a is greater than 1 • multiple representations of one whole using fractions with the same denominator • that addition of fractions is joining parts that are referring to the same whole • that subtraction of fractions is separating parts 	<ul style="list-style-type: none"> • replace mixed numbers with equivalent fractions, using visual fraction models • replace improper fractions with a mixed number, using visual fraction models • decompose fractions as an equation and explain the equation using visual fraction models

<p>that are referring to the same whole</p> <ul style="list-style-type: none">• how to replace a mixed number with an equivalent one• how to replace an improper fraction with a mixed number	<ul style="list-style-type: none">• add and subtract fractions with like denominators• add and subtract mixed numbers with like denominators by using properties of operations and the relationship between addition and subtraction• add and subtract mixed numbers by replacing each mixed number with an equivalent fraction• solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, by using visual fraction models and equations to represent the problem
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Unit 12: Understanding Decimals	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • How can visual models be used to help with understanding decimals? • How can visual models be used to determine and compare equivalent fractions and decimals? • How would you compare and order decimals through hundredths? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • Fractions with denominators of 10 can be expressed as an equivalent fraction with a denominator of 100. • Fractions with denominators of 10 and 100 may be expressed using decimal notation. • When comparing two decimals to hundredths, the comparisons are valid only if they refer to the same whole.
Curriculum Standards- DOK noted where applicable with Standards	
<p>4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurement quantities using diagrams such as number line diagrams that feature a measurement scale. (DOK 1,2)</p> <p>4.NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$. (DOK 1)</p> <p>4.NF.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $\frac{62}{100}$; describe a length of 0.62 meters; locate 0.62 on a number line diagram. (DOK 1)</p> <p>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. (DOK 1,2,3)</p> <p>MP-Make sense of problems and persevere in solving them MP-Reason abstractly and quantitatively MP-Construct viable arguments and critique the reasoning of others MP-Model with mathematics MP-Use appropriate tools strategically MP-Attend to precision MP-Look for and make use of structure MP-Look for and express regularity in repeated reasoning</p>	
LEARNING TARGETS	
Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none"> • A fraction with a denominator of 10 can also be expressed as an equivalent fraction with a denominator of 100. • A number can be represented as both a fraction and a decimal. • Decimal comparisons are only valid when the two decimals refer to the same whole. 	<ul style="list-style-type: none"> • Use pictures and equations to represent and solve addition, subtraction, • Represent a fraction with denominator 10 as an equivalent fraction with denominator 100. • Add two fractions with denominators 10 and 100 using manipulatives, pictures, written symbols, and language to explain the process. • Write fractions with 10 and 100 in the

	<p>denominator as decimals.</p> <ul style="list-style-type: none">• Compare two decimals to the hundredths using $<$, $>$, $=$.• Identify if decimal comparisons are valid or invalid and explain why.• Justify the conclusions using manipulatives, pictures, and/or language.
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Unit 14: Area and Perimeter	
<p>Essential Questions:</p> <ul style="list-style-type: none"> How do you find the area and perimeter of geometric figures and how can using the formulas for perimeter and area help you solve real-world problems? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> Perimeter is a real life application of addition and subtraction. Area is a real life application of multiplication and division.
Curriculum Standards- DOK noted where applicable with Standards	
<p>4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. (DOK 1,2)</p> <p>MP-Make sense of problems and persevere in solving them MP-Reason abstractly and quantitatively MP-Construct viable arguments and critique the reasoning of others</p> <p>MP-Model with mathematics MP-Use appropriate tools strategically</p> <p>MP-Attend to precision MP-Look for and make use of structure MP-Look for and express regularity in repeated reasoning</p>	
LEARNING TARGETS	
Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none"> The formula for perimeter of geometric figures. The formula for area of rectangles. 	<ul style="list-style-type: none"> Solve problems involving area and perimeter of rectangles using visuals and equations that represent the formulas for area and perimeter of rectangles. solve area and perimeter problems in which there is an unknown factor (n)

Unit: Patterns and Expressions	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • What strategies can be used to find rules for patterns and what predictions can the pattern support? • How are the four basic operations related to one another? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • Patterns are generated by following a specific rule. • Rounding numbers can be used when estimating answers to real-world problems. • The four operations are interconnected.
Curriculum Standards- DOK noted where applicable with Standards	
<p>4.OA.3 Solve multi-step 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. (DOK 1,2,3)</p>	
<p>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. (DOK 1)</p>	
<p>MP-Make sense of problems and persevere in solving them MP-Reason abstractly and quantitatively MP-Construct viable arguments and critique the reasoning of others MP-Model with mathematics MP-Use appropriate tools strategically MP-Attend to precision MP-Look for and make use of structure MP-Look for and express regularity in repeated reasoning</p>	
LEARNING TARGETS	
Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none"> • Patterns are generated by following a specific rule. • How the four operations can be used to solve real-world and mathematical problems. 	<ul style="list-style-type: none"> • Generate a pattern that follows a rule. • Given a pattern, identify the rule and extend the pattern and also identify apparent features of a pattern that follows a given rule, which are not explicit in the rule itself. • Solve multi-step word problems posed with whole numbers and having whole number answers using the four operations • Represent multi-step word problems using equations with a variable standing for the unknown quantity • Assess the reasonableness of answers using mental computation and estimation strategies, including rounding