

# East Prairie Fifth Grade Math Pacing Guide

2016-2017

Nine Weeks:

**X** 1<sup>st</sup>

☐ 2<sup>nd</sup>

☐ 3<sup>rd</sup>

☐ 4<sup>th</sup>

## Operations and Algebraic Thinking

- ☐ Write and interpret numerical expressions.
- ☐ Analyze patterns and relationships

## Numbers and Operations in Base Ten

- X** Understand the place value system
  - ☐ Perform operations with multi-digit whole numbers and with decimals to hundredths
- ### Numbers and Operations Fractions
- ☐ Use equivalent fractions as a strategy to add and subtract fractions
  - ☐ Apply and extend previous understandings of multiplication and division to multiply and divide fractions

## Measurement and Data

- ☐ Convert like measurement units within a given measurement system.
- ☐ Represent and interpret data
- ☐ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

## Geometry

- ☐ Graph points on the coordinate plane to solve real-world and mathematical problems
- ☐ Classify two-dimensional figures into categories based on their properties.

**Common Core Standard: 5.NBT.1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

**Key Vocabulary:** place value, whole number, number names, standard form, digit, decimal, decimal point, patterns, multiple, product, divide, tenths, hundredths, thousandths, greater than (>), less than (<), equal to (=), number line, compare, comparison, round, estimate, decimal notation, decimal fraction, exponent, expanded form (decimals and fractions), expanded notation, benchmark numbers (0, 0.20, 0.25, 0.33, 0.5, 0.67, 0.75, 1.0, 1.5, etc.), powers of 10, base 10, equivalence

| Essential Question  | Suggested Mathematical Practices  | Student Outcomes  | Suggested Activities   | Materials Needed Websites   |
|---|---|---|--|---|
| <b>What is the rule for multiplying decimals by 10, 100, or 1000?</b> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Make sense of problems and persevere in solving them.</li> <li><input type="checkbox"/> Reason abstractly and quantitatively.</li> <li><input type="checkbox"/> Construct viable arguments and critique the reasoning of others.</li> </ul> <p><b>x Model with mathematics.</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use appropriate tools strategically.</li> </ul> <p><b>x Attend to precision.</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Look for and make use of structure.</li> </ul> | <p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>- understand the relationship between each number in a multi-digit number</li> <li>-identify place value using the base 10 system.</li> </ul> | <p>Students write numbers 2 and 20 on place value charts and represent 20 unit cubes from base-ten blocks. Students divide unit cubes into groups of 2 and determine the number of groups. Students discuss connections between the numbers written on place value charts and the representative groups. Students write numbers 120 and 12 on place value charts and predict how many times larger 120 is than 12. Students use ten rods and unit cubes to show 12 equal groups of 120. Students reason that 12 is 1/10 of 120 or 120 is 10 times larger than 12. Students use patterns to analyze larger numbers.</p> | <p><a href="#">Place Value Power</a></p> <p><a href="#">Place Value with Decimals</a></p> <p><a href="#">Place Value</a></p> <p><a href="#">Games</a></p> <p><a href="#">Place Value Perfection</a></p> |

|  |  |  |  |  |
|--|--|--|--|--|
|  | <p><input type="checkbox"/> Look for and express regularity in repeated reasoning.</p> | <p>-recognize that a digit in the ones place represents 10 times as much as it represents in the place to its right.</p> <p>-recognize that a digit in the ones place represents 1/10 of what it represents in the place to its left.</p> <p><b>I will.....</b></p> <p>-identify numbers using base ten place value.</p> <p>-recognize one place value represents 10 times the amount as the number to its right.</p> <p>-recognize the digit to the right is one tenth of the number to its left.</p> | <p>Students use place value charts to write numbers (e.g., 135 and 13.5 or 1002 and 100.2). Students use calculators to divide 135 by 13.5 and divide 1002 by 100.2. Students multiply 13.5 by 10 and 100.2 by 10 and discuss patterns observed. Students apply the process to recognize place-value patterns.</p> <p>When given the standard form 447.382; Students will write the expanded form: <math>4 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 8 \times (1/100) + 2 \times (1/1000)</math>.</p> <p>Have students explain that every decimal place indicates a multiple of a power of 10. [I.e. The digit to the immediate left of the decimal point is the ones place value position. The first digit to the right of the decimal point is the tenth's place value position (1/10)].</p> <p>Number cards, number cubes, spinners and other manipulatives can be used to generate decimal numbers. For example, have students roll three number cubes, then create the largest and smallest number to the thousandth's place. Ask students to represent the number with numerals and words.</p> |  |
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## Operations and Algebraic Thinking

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## Numbers and Operations in Base Ten

- X** Understand the place value system
- X** Perform operations with multi-digit whole numbers and with decimals to hundredths

## Numbers and Operations Fractions

- ☐ Use equivalent fractions as a strategy to add and subtract fractions
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## Measurement and Data

- ☐ Convert like measurement units within a given measurement system.
- ☐ Represent and interpret data
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## Geometry

- ☐ Graph points on the coordinate plane to solve real-world and mathematical problems
- ☐ Classify two-dimensional figures into categories based on their properties.

**Common Core Standard: 5.NBT.2** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

**Key Vocabulary:** place value, whole number, number names, standard form, digit, decimal, decimal point, patterns, multiple, product, divide, tenths, hundredths, thousandths, greater than (>), less than (<), equal to (=), number line, compare, comparison, round, estimate, decimal notation, decimal fraction, exponent, expanded form (decimals and fractions), expanded notation, benchmark numbers (0, 0.20, 0.25, 0.33, 0.5, 0.67, 0.75, 1.0, 1.5, etc.), powers of 10, base 10, equivalence

| Essential Question   | Suggested Mathematical Practices  | Student Outcomes  | Suggested Activities   | Materials Needed Websites   |
|--|---|---|--|---|
| <b>What is the relationship between place value and powers of ten?</b> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Make sense of problems and persevere in solving them.</li> <li><b>x Reason abstractly and quantitatively.</b></li> <li><input type="checkbox"/> Construct viable arguments and critique the reasoning of others.</li> <li><b>x Model with mathematics.</b></li> <li><b>x Use appropriate tools strategically.</b></li> <li><b>x Attend to precision.</b></li> </ul> | <p><b>I can.....</b></p> <p>-demonstrate the powers of 10 using whole number exponents.</p> <p>-explain how to multiply or divide powers of 10.</p> | <p>Students study the equation <math>10 \times 10 \times 10 = 10^3</math>. Students multiply the first two factors, recording the product. Students multiply that product by the third factor, recording the final product. Students observe patterns of zeros and predict the results of <math>10^4</math> and <math>10^5</math>. Students conclude the relationship between the power of ten and the number of zeros.</p> <p>Have students show that when given the number 1,398.657 moving the decimal to the right denotes being multiplied by a power of 10. Meanwhile,</p> | <p><a href="#">Exponents and Powers of 10</a></p> <p><a href="#">Multiply Powers of 10</a></p> <p><a href="#">Divide Powers of 10</a></p> |

**x Look for and make use of structure.**

☐ Look for and express regularity in repeated reasoning.

-explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.

**I will.....**

-define an exponent.

-define exponents to the powers of ten.

-analyze problems with exponents using the powers of ten.

-determine the relationship of numbers when multiplying by the powers of ten.

-determine the relationship of numbers when dividing by the powers of ten.

-explore the placement of the decimal point based on the multiplication of the powers of ten.

-explore the placement of the decimal point based on the division of the powers of ten.

moving the decimal to the left denotes being divided by a multiple of 10.

$1,398.657 \times 100 = 139,865.7$  (2 Jumps to the right. "Count the zeros")

$1,398.657 / 100 = 13.98657$  (2 Jumps to the left. "Count the number of zeros")

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**Common Core Standard: 5.NBT.3** Read, write, and compare decimals to thousandths.

- a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g.,  $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$ .
- b. Compare two decimals to thousandths based on meanings of the digits in each place, using  $>$ ,  $=$ , and  $<$  symbols to record the results of comparisons.

**Key Vocabulary:** place value, whole number, number names, standard form, digit, decimal, decimal point, patterns, multiple, product, divide, tenths, hundredths, thousandths, greater than ( $>$ ), less than ( $<$ ), equal to ( $=$ ), number line, compare, comparison, round, estimate, decimal notation, decimal fraction, exponent, expanded form (decimals and fractions), expanded notation, benchmark numbers (0, 0.20, 0.25, 0.33, 0.5, 0.67, 0.75, 1.0, 1.5, etc.), powers of 10, base 10, equivalence

| Essential Question  | Suggested Mathematical Practices  | Student Outcomes  | Suggested Activities   | Materials Needed Websites  |
|---|---|---|--|--|
| <b>How do you read and write decimals in standard, expanded, and word form?</b> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Make sense of problems and persevere in solving them.</li> <li><input type="checkbox"/> Reason abstractly and quantitatively.</li> <li><input type="checkbox"/> Construct viable arguments and critique the reasoning of others.</li> </ul> <p><b>x Model with mathematics.</b></p> | <p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>-read decimals to thousandths.</li> <li>-write decimals to thousandths using base ten numerals, number names, and expanded form.</li> </ul> | <p>Students create a book comparing decimals to thousandths. They should support their book with illustrations, text, and recorded narration.</p> <p>Students record called decimal numbers on place value charts (e.g., 209.5). Students read each numeral and recite its respective place value (e.g., 2 hundreds, 0 tens, 9 ones and 5 tenths). Students write expanded forms of called numbers and check</p> | <p><a href="#">Fraction / Decimal War</a></p> <p><a href="#">Comparing Decimals</a></p> <p><a href="#">Comparing Decimals Game</a></p> |

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| <p><b>How do you compare and order decimal numbers?</b></p> | <p> <b>x Use appropriate tools strategically.</b><br/> <b>x Attend to precision.</b><br/> <b>x Look for and make use of structure.</b><br/> <input type="checkbox"/> Look for and express regularity in repeated reasoning.         </p> | <p>-compare decimals to thousandths using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math>.</p> <p><b>I will.....</b></p> <p>-write decimals to the thousandths place using base ten, number names, and expanded form.</p> <p>-read decimals to the thousandths place using base ten, number names, and expanded form.</p> <p>-compare decimals to the thousandths place using base ten, number names, and expanded form.</p> | <p>the expanded forms by multiplying each numeral by the value of its place and completing the addition.</p> <p>Students represent decimal numbers using decimal tiles (e.g., 0.2, 0.125), compare the decimals, and write comparison sentences for the values (0.2, 2, 0.125). Students transfer numbers to place value charts to verify expressions, comparing digits in each place value starting at tenths and working to thousandths.</p> |  |
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## Numbers and Operations in Base Ten

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## Numbers and Operations Fractions

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## Measurement and Data

- ☐ Convert like measurement units within a given measurement system.
- ☐ Represent and interpret data
- ☐ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

## Geometry

- ☐ Graph points on the coordinate plane to solve real-world and mathematical problems
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**Common Core Standard: 5.NBT.4** Use place value understanding to round decimals to any place.

**Key Vocabulary:** place value, whole number, number names, standard form, digit, decimal, decimal point, patterns, multiple, product, divide, tenths, hundredths, thousandths, greater than (>), less than (<), equal to (=), number line, compare, comparison, round, estimate, decimal notation, decimal fraction, exponent, expanded form (decimals and fractions), expanded notation, benchmark numbers (0, 0.20, 0.25, 0.33, 0.5, 0.67, 0.75, 1.0, 1.5, etc.), powers of 10, base 10, equivalence

| Essential Question  | Suggested Mathematical Practices  | Student Outcomes   | Suggested Activities  | Materials Needed Websites  |
|---|---|--|---|--|
| <b>How do you use rounding and benchmark numbers to estimate amounts?</b> | <ul style="list-style-type: none"> <li><b>x</b> Make sense of problems and persevere in solving them.</li> <li><b>x</b> Reason abstractly and quantitatively.</li> <li><b>x</b> Construct viable arguments and critique the reasoning of others.</li> <li><b>x</b> Model with mathematics.                             <ul style="list-style-type: none"> <li><input type="checkbox"/> Use appropriate tools strategically.</li> <li><input type="checkbox"/> Attend to precision.</li> <li><input type="checkbox"/> Look for and make use of structure.</li> </ul> </li> </ul> | <p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>-use place value understanding to round decimals to any given place.</li> </ul> <p><b>I will.....</b></p> <ul style="list-style-type: none"> <li>-identify benchmark numbers (0, 0.20, 0.25, 0.33, 0.5, 0.67, 0.75, 1.0, 1.5, etc).</li> </ul> | <p>Students create an informational video explaining how to round decimals to any place.</p> <p>Students create flow charts showing the process for rounding decimals to any given place.</p> | <p><a href="#">Rounding Decimals</a></p> <p><a href="#">Rounding Decimals Game</a></p> |

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|  | <input type="checkbox"/> Look for and express regularity in repeated reasoning. | <p>-use benchmark numbers for comparing and rounding numbers.</p> <p>-explain why a number is rounded to a given place value.</p> |  |  |
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## Geometry

- ☐ Graph points on the coordinate plane to solve real-world and mathematical problems
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**Common Core Standard: 5.NBT.5** Fluently multiply multi-digit whole numbers using the standard algorithm.

**Key Vocabulary:** algorithms, multiplication, multiply, division, divide, decimal, decimal point, tenths, hundredths, thousandths, products, quotients, dividends, equation, rectangular arrays, area models, addition, add, subtraction, subtract, properties (associative, commutative, identity, distributive, zero), reasoning, finite decimal, repeating decimal, divisor, decompose, remainder, partial product

| Essential Question                                     | Suggested Mathematical Practices   | Student Outcomes   | Suggested Activities  | Materials Needed Websites  |
|--|--|--|---|--|
| How do you use an algorithm to multiply whole numbers? | <b>x Make sense of problems and persevere in solving them.</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Reason abstractly and quantitatively.</li> <li><input type="checkbox"/> Construct viable arguments and critique the reasoning of others.</li> </ul> <b>x Model with mathematics.</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use appropriate tools strategically.</li> </ul> <b>x Attend to precision.</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Look for and make use of structure.</li> </ul> <b>x Look for and express regularity in repeated reasoning.</b> | <b>I can.....</b><br>-multiply multi digit whole numbers accurately.<br><br><b>I will.....</b><br>-rewrite the problem by using strategies related to the distributive property or breaking numbers apart.<br><br>-solve the problem using the standard algorithm and/or strategies. | Students use place value to find products of two multi-digit numbers (e.g., 25 x 519). Students describe the steps to solve the problems based on place value (e.g., 5 times 9 ones, 5 times 1 ten, and 5 times 5 hundreds; 20 times 9 ones, 20 times 1 ten, and 20 times 5 hundreds). Students combine products for final answers.<br><br>Students use standard algorithms and compare products.<br><br>Lattice Multiplication | <a href="#">Lattice Multiplication</a><br><br><a href="#">Lattice</a><br><br><a href="#">Properties Foldable</a> |

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**Common Core Standard: 5.NBT.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.

**Key Vocabulary:** algorithms, multiplication, multiply, division, divide, decimal, decimal point, tenths, hundredths, thousandths, products, quotients, dividends, equation, rectangular arrays, area models, addition, add, subtraction, subtract, properties (associative, commutative, identity, distributive, zero), reasoning, finite decimal, repeating decimal, divisor, decompose, remainder, partial product

| Essential Question   | Suggested Mathematical Practices  | Student Outcomes  | Suggested Activities   | Materials Needed Websites  |
|--|---|---|--|--|
| What strategies can you use to divide whole numbers with up to 4-digit dividends and 2-digit divisors? | <b>x Make sense of problems and persevere in solving them.</b><br><input type="checkbox"/> Reason abstractly and quantitatively.<br><input type="checkbox"/> Construct viable arguments and critique the reasoning of others.<br><b>x Model with mathematics.</b><br><input type="checkbox"/> Use appropriate tools strategically.<br><b>x Attend to precision.</b><br><input type="checkbox"/> Look for and make use of structure. | <b>I can.....</b><br>-explore different strategies to find quotients of whole numbers with up to four digit dividends and two digit divisors. | Using grid paper, students represent division problems by forming rectangular arrays. Students plot the dividend in rows/columns as indicated by the divisor. Students determine the quotient by counting the number of rows/columns. Students solve the division problems using the standard algorithm and write the step-by-step process used to find the quotient.<br><br>Use the mnemonic device for the steps of division Does McDonalds Sell Burgers with Cheese (Divide, Multiply, Subtract, Bring Down, Check)-Cheeseburgers | <a href="#">Division Videos</a><br><br><a href="#">Divisibility Rules Foldable</a> |

**x Look for and express regularity in repeated reasoning.**

- use arrays, models, and equations to show how to divide whole numbers with up to four digits by two digits accurately.

**I will.....**

-identify different components of a division problem.

-divide using place value.

-divide using the properties of operation i.e. repeated subtraction.

-explain the relationship between multiplication and division.

-draw a picture to illustrate the division process.

-illustrate division using an equation.

-illustrate division using rectangular arrays.

-illustrate division using area models.

**Students should learn to estimate decimal computations before they compute with pencil and paper. The focus on estimation should be on the meaning of the numbers and the operations, not on how many decimal places are involved. For example, to estimate the product of  $32.84 \times 4.6$ , the estimate would be more than 120, closer to 150. Students should consider that 32.84 is closer to 30 and 4.6 is closer to 5. The product of 30 and 5 is 150. Therefore, the product of  $32.84 \times 4.6$  should be close to 150. (*Writing equations horizontally encourages using mental math*).**

Have students use estimation to find the product by using exactly the same digits in one of the factors with the decimal point in a different position each time. For example, have students estimate the product of  $275 \times 3.8$ ;  $27.5 \times 3.8$  and  $2.75 \times 3.8$ , and discuss **why** the estimates should or should not be the same.

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**Common Core Standard: 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.

**Key Vocabulary:** algorithms, multiplication, multiply, division, divide, decimal, decimal point, tenths, hundredths, thousandths, products, quotients, dividends, equation, rectangular arrays, area models, addition, add, subtraction, subtract, properties (associative, commutative, identity, distributive, zero), reasoning, finite decimal, repeating decimal, divisor, decompose, remainder, partial product

| Essential Question   | Suggested Mathematical Practices  | Student Outcomes   | Suggested Activities   | Materials Needed Websites  |
|--|---|--|--|--|
| How can you use addition, subtraction, multiplication, and division to show real world problems? | <ul style="list-style-type: none"> <li>x Make sense of problems and persevere in solving them.</li> <li>x Reason abstractly and quantitatively.</li> <li>x Construct viable arguments and critique the reasoning of others.</li> <li>x Model with mathematics.</li> <li>x Use appropriate tools strategically.</li> <li>x Attend to precision.</li> </ul> | <p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>-add, subtract, multiply, and divide decimals</li> <li>-use drawings and written words to explain how to add, subtract, multiply, and divide decimals to the hundredth's accurately</li> </ul> | <p>Students create an informational video for study explaining the properties of addition supporting it with illustrations, text, and recorded narration.</p> <p>Students outline 10 x 10 squares on centimeter grid paper to represent addition and subtraction of decimal numbers. Using yellow markers, students shade given addends (e.g., 0.25, 0.12). Students count the number of shaded grids to find sums and record equations (e.g., <math>0.25 + 0.12 = 0.37</math>). Students use the same grids to solve for differences of numbers (e.g., <math>0.37 - 0.12 = 0.25</math>). Students write all possible equations for the model and draw</p> | <p><a href="#">Adding and Subtracting Decimals</a></p> <p><a href="#">Multiplying Decimals Video</a></p> <p><a href="#">Multiplying Decimals Animation</a></p> <p><a href="#">Decimals</a></p> |

|  |  |   |  |  |
|--|--|---|--|--|
|  | <p><b>x Look for and make use of structure.</b></p> <p><b>x Look for and express regularity in repeated reasoning.</b></p> | <p>-explain how to add, subtract, multiply, and divide decimals to the hundredth's place value.</p> <p><b>I will.....</b></p> <p>-use concrete models to add, subtract, multiply and divide decimals to the hundredth's place value.</p> <p>-use a pictorial representation to add, subtract, multiply and divide decimals to the hundredth's place value.</p> <p>-use algorithms to add, subtract, multiply and divide decimals to the hundredth's place value.</p> <p>-explain in writing the reasoning I used to add, subtract, multiply and divide decimals to the hundredth's place value.</p> | <p>conclusions about the relationship of addition and subtraction.</p> |  |
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- ☐ Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

## Measurement and Data

- ☐ Convert like measurement units within a given measurement system.
- ☐ Represent and interpret data
- ☐ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

## Geometry

- X** Graph points on the coordinate plane to solve real-world and mathematical problems
- ☐ Classify two-dimensional figures into categories based on their properties.

**Common Core Standard: 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.g., x-axis and x-coordinate, y-axis and y-coordinate).

**Key Vocabulary:** coordinate system, perpendicular, coordinate plane, first quadrant, points, predict, lines, axis, axes, x-axis, y-axis, horizontal, vertical, intersection of lines, origin, ordered pairs, coordinates, x-coordinate, y-coordinate, (x,y)

| Essential Question   | Suggested Mathematical Practices  | Student Outcomes  | Suggested Activities   | Materials Needed Websites                      |
|--|---|---|--|--|
| <b>How can I plot ordered pairs in the first quadrant on a coordinate plane?</b> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Make sense of problems and persevere in solving them.</li> <li><input type="checkbox"/> Reason abstractly and quantitatively.</li> <li><input type="checkbox"/> Construct viable arguments and critique the reasoning of others.</li> </ul> <p><b>x Model with mathematics.</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use appropriate tools strategically.</li> </ul> <p><b>x Attend to precision.</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Look for and make use of structure.</li> </ul> | <p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>-use a coordinate system to graph/locate ordered pairs.</li> <li>- plot ordered pairs in the first quadrant of the coordinate plane.</li> </ul> | <p>Students create class coordinate grids using painter's tape. When given ordered pairs students walk from the origin (0, 0) to the assigned points, describing the action in words (e.g., My ordered pair is (2, 3) so I will walk 2 spaces on the x-axis to the right and turn and walk 3 spaces on the y-axis.).</p> <p>Students work in pairs using geoboards to represent coordinate planes. Students point out the origin, the x-axis, and the y-axis on geoboards. Partner A places a donut counter on a peg of the geoboard. Without seeing the geoboard, Partner B</p> | <p><a href="#">Coordinate Grid Tangram</a></p> |

|  |  |   |  |  |
|--|--|---|--|--|
|  | <p><input type="checkbox"/> Look for and express regularity in repeated reasoning.</p> | <p><b>I will.....</b></p> <ul style="list-style-type: none"> <li>-identify the x and y axis.</li> <li>- identify the x-coordinate and y-coordinate.</li> <li>-plot ordered pairs using the x and y coordinates on a coordinate grid.</li> <li>-connect the ordered pairs on the coordinate grid.</li> </ul> | <p>must guess the location of the counter by naming an ordered pair. With each guess, Partner A provides clues to guide Partner B to the ordered pair that names the correct location.</p> <p>Explain to students that an ordered pair is written with the x-axis number, then the y- axis.</p> <p>Use a coordinate plane to locate places and objects.</p> <p>Students need to understand the underlying structure of the coordinate system and see how axes make it possible to locate points anywhere on a coordinate plane. This is the first time students are working with coordinate planes, and only in the first quadrant. It is important that students create the coordinate grid themselves. This can be related to two number lines and reliance on previous experiences with moving along a number line.</p> |  |
|--|--|---|--|--|

# East Prairie Fifth Grade Math Pacing Guide

2016-2017

Nine Weeks:

☐ 1<sup>st</sup>

☐ 2<sup>nd</sup>

**X 3<sup>rd</sup>**

☐ 4<sup>th</sup>

## Operations and Algebraic Thinking

- ☐ Write and interpret numerical expressions.
- ☐ Analyze patterns and relationships

## Numbers and Operations in Base Ten

- ☐ Understand the place value system
- ☐ Perform operations with multi-digit whole numbers and with decimals to hundredths

## Numbers and Operations Fractions

- ☐ Use equivalent fractions as a strategy to add and subtract fractions
- ☐ Apply and extend previous understandings of multiplication and division to multiply and divide fractions

## Measurement and Data

- ☐ Convert like measurement units within a given measurement system.
- ☐ Represent and interpret data
- ☐ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

## Geometry

**X** Graph points on the coordinate plane to solve real-world and mathematical problems

- ☐ Classify two-dimensional figures into categories based on their properties.

**Common Core Standard: 5.G.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

**Key Vocabulary:** coordinate system, perpendicular, coordinate plane, first quadrant, points, predict, lines, axis, axes, x-axis, y-axis, horizontal, vertical, intersection of lines, origin, ordered pairs, coordinates, x-coordinate, y-coordinate, (x,y)

| Essential Question   | Suggested Mathematical Practices   | Student Outcomes  | Suggested Activities   | Materials Needed Websites   |
|--|--|---|--|---|
| How can I plot points in the first quadrant of a coordinate plane to represent real world and mathematical problems? | <ul style="list-style-type: none"> <li>x Make sense of problems and persevere in solving them.</li> <li>x Reason abstractly and quantitatively.</li> <li>x Construct viable arguments and critique the reasoning of others.</li> <li>x Model with mathematics.</li> <li>x Use appropriate tools strategically.</li> <li>x Attend to precision.</li> <li>x Look for and make use of structure.</li> <li>x Look for and express regularity in repeated reasoning.</li> </ul> | <p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>- graph points in the first quadrant</li> <li>-graph real world and mathematical problems on the coordinate plane.</li> <li>- interpret real world mathematical problems on a coordinate grid.</li> </ul> | <p>Use a coordinate plane to graph relationships.</p> <p>Use ordered pairs to determine if information is relevant or irrelevant in solving problems.</p> <p>When provided data on input-output tables, students create word problems with corresponding coordinate planes that represent the solutions (e.g., For the input-output table 1-3,2-6,3-9,4-12, students might compose this problem: Elijah earns \$3.00 per hour helping his father. How much money did Elijah earn after 3 hours? How many hours did Elijah work to earn \$12.00?).</p> <p>Students work in pairs to locate places on road maps using the coordinate systems. Students</p> | <p><a href="#">Gridding a Site</a></p> <p><a href="#">Finding your Way Around</a></p> |



|  |  |  |   |  |
|--|--|--|---|--|
|  |  | <p><b>I will.....</b></p> <ul style="list-style-type: none"><li>-interpret the problem in order to graph ordered pairs on a coordinate grid.</li><li>- interpret the graph in order to solve the real world problem.</li></ul> | <p>compare road map coordinate systems to coordinate planes. Students draw maps of the classroom on coordinate planes, placing one corner of the classroom at the origin. Students write ordered pairs to show locations of specified items in the classroom (e.g., teacher's desk, computer, bookshelf).</p> <p>Multiple experiences with plotting points are needed. Provide points plotted on a grid and have students name and write the ordered pair. Have students <b>describe</b> how to get to the location. Encourage students to articulate directions, attending to precision as they plot points.</p> <p>Present real-world and mathematical problems and have students graph points in the first quadrant of the coordinate plane. Gathering and graphing data is a valuable experience for students. It helps them to develop an understanding of coordinates and what the overall graph represents. Students also need to analyze the graph by interpreting the coordinate values in the context of the situation.</p> |  |
|--|--|--|---|--|

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## Operations and Algebraic Thinking

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☐ Analyze patterns and relationships

## Numbers and Operations in Base Ten

- ☐ Understand the place value system  
☐ Perform operations with multi-digit whole numbers and with decimals to hundredths

## Numbers and Operations Fractions

- ☐ Use equivalent fractions as a strategy to add and subtract fractions  
☐ Apply and extend previous understandings of multiplication and division to multiply and divide fractions

## Measurement and Data

- ☐ Convert like measurement units within a given measurement system.  
☐ Represent and interpret data  
☐ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

## Geometry

- ☐ Graph points on the coordinate plane to solve real-world and mathematical problems  
☐ Classify two-dimensional figures into categories based on their properties.

**Common Core Standard: 5.OA.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

**Key Vocabulary:** parentheses ( ), brackets [ ], braces { }, numerical expressions, order of operations, compute, simplify the expression, variable, equation, simple expressions, sum, product

| Essential Question  | Suggested Mathematical Practices   | Student Outcomes   | Suggested Activities   | Materials Needed Websites  |
|---|--|--|--|--|
| <b>How can I evaluate expressions that contain parentheses, brackets, and braces?</b> | <input type="checkbox"/> Make sense of problems and persevere in solving them.<br><input type="checkbox"/> Reason abstractly and quantitatively.<br><input type="checkbox"/> Construct viable arguments and critique the reasoning of others.<br><b>x Model with mathematics.</b><br><input type="checkbox"/> Use appropriate tools strategically.<br><b>x Attend to precision.</b><br><input type="checkbox"/> Look for and make use of structure.<br><input type="checkbox"/> Look for and express regularity in repeated reasoning. | <b>I can.....</b><br>-evaluate how to use numerical expressions with parentheses, brackets, and braces.<br><br><b>I will.....</b><br>-evaluate a numerical expression.<br><br>-identify parentheses, brackets, and braces. | Working in groups of 4, students receive bags containing number cards (6 cards of 0-12), bags containing symbol cards (9 cards of symbols +, -, x, 7), and 2 pair of parentheses cards cut from plastic sheets. To begin the activity, students draw 5 cards from the number bags and 5 cards from the symbol bags. With a time limit of 3 minutes, students use combinations of the 10 drawn cards and the parentheses to form expressions with the largest possible values, using as many of the cards as needed. When time is called, students reveal the expressions and values. Students with the expressions of largest value earn 4 points while remaining students earn 1 point. Students return cards to bags and repeat the activity for a specified number of rounds. | <a href="#">Operations Key Words</a><br><a href="#">Order of Operations Game</a><br><a href="#">Order of Operations Quizzes</a><br><a href="#">Order of Operations</a> |

|  |  |   |   |  |
|--|--|---|---|--|
|  |  | <p>-evaluate the relationship between parentheses, brackets, and braces.</p> <p>-determine the order of operations by solving the expression in the parentheses, then in the brackets and then in the braces.</p> | <p>Students use three 3s, operation symbols, and grouping symbols to create multiple expressions with different solutions. As a class, record the expressions and solutions, pointing out how the placement of grouping symbols affects the answer. Extend the activity using four 4s or five 5s.</p> <p>Students create an informational document explaining the use of parentheses and brackets supporting it with illustrations and text.</p> <p>Begin with expressions that have two operations without any grouping symbols (multiplication or division combined with addition or subtraction) before introducing expressions with multiple operations. Using the same digits, with the operations in a different order, have students evaluate the expressions and discuss why the value of the expression is different. For example, have students evaluate <math>5 \times 3 + 6</math> and <math>5 + 3 \times 6</math>. Discuss the rules that must be followed. Have students insert parentheses around the multiplication or division part in an expression. A discussion should focus on the similarities and differences in the problems and the results. This leads to students being able to solve problem situations which require that they know the order in which operations should take place.</p> |  |
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## Measurement and Data

- ☐ Convert like measurement units within a given measurement system.
- ☐ Represent and interpret data
- ☐ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

## Geometry

- ☐ Graph points on the coordinate plane to solve real-world and mathematical problems
- ☐ Classify two-dimensional figures into categories based on their properties.

**Common Core Standard: 5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation “add 8 and 7, then multiply by 2” as  $2 \times (8 + 7)$ . Recognize that  $3 \times (18932 + 921)$  is three times as large as  $18932 + 921$ , without having to calculate the indicated sum or product..*

**Key Vocabulary:** parentheses ( ), brackets [ ], braces { }, numerical expressions, order of operations, compute, simplify the expression, variable, equation, simple expressions, sum, product

## Essential Question

## Suggested Mathematical Practices

## Student Outcomes

## Suggested Activities

## Materials Needed Websites

**What strategies can I use to write simple expressions to represent a real world problem?**

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

**I can.....**

-write simple expressions, and describe numerical expressions.

**I will.....**

-create a simple expression (+, -, x, ÷).

Students work in pairs to create expressions using two spinners, one with sections labeled add or subtract, and the other with sections labeled multiply or divide. Students roll number cubes to determine the first number in expressions, spin the add/subtract spinner for first operations and roll number cubes for second numbers. Students record spins and place parentheses around the first part of the expression. Students spin the multiply/divide spinner for second operations and roll number cubes for final numbers. Students complete the expressions to represent the spins and rolls and describe expressions in words to partners (e.g., 2 subtracted from 5 then multiplied by 3). Students

[Equations to represent word problems](#)

|  |  |  |   |  |
|--|--|--|---|--|
|  |  | <p>-verbally explain the relationship between expressions without calculating them.</p> <p>-verbally explain the relationship between numbers using a place value.</p> | <p>record expressions on note cards and write the expressions in words with explanations of meaning on the reverse sides of cards (e.g., <math>15 - 9 \times 6</math>: the answer is 6 times greater than <math>(15 - 9)</math>). Students trade cards with partners to check for accuracy, discussing discrepancies and questions of reasonableness.</p> <p>Students illustrate and type simple expressions. For example, express the calculation “add 8 and 7, then multiply by 2” as <math>2 \times (8 + 7)</math>. Recognize that <math>3 \times (18932 + 921)</math> is three times as large as <math>18932 + 921</math>, without having to calculate the indicated sum or product.</p> <p>After students have evaluated expressions without grouping symbols, present problems with one grouping symbol, beginning with parentheses, then in combination with brackets and/or braces.</p> <p>Have students write numerical expressions in words without calculating the value. This is the foundation for writing algebraic expressions. Then, have students write numerical expressions from phrases without calculating them.</p> |  |
|--|--|--|---|--|

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## Geometry

- ☐ Graph points on the coordinate plane to solve real-world and mathematical problems
- ☐ Classify two-dimensional figures into categories based on their properties.

**Common Core Standard: 5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

**Key Vocabulary:** numerical patterns, rules, ordered pairs, coordinate plane, sequence of numbers, frequency table, line graph, independent variable, dependent variable, constant rate of change

| Essential Question   | Suggested Mathematical Practices  | Student Outcomes  | Suggested Activities  | Materials Needed Websites   |
|--|---|---|---|---|
| <b>How do I create a graph on a coordinate plane that represents two patterns?</b> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Make sense of problems and persevere in solving them.</li> <li><b>x Reason abstractly and quantitatively.</b></li> <li><input type="checkbox"/> Construct viable arguments and critique the reasoning of others.</li> <li><b>x Model with mathematics.</b></li> <li><input type="checkbox"/> Use appropriate tools strategically.</li> <li><input type="checkbox"/> Attend to precision.</li> <li><b>x Look for and make use of structure.</b></li> </ul> | <p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>-generate patterns using two given rules.</li> <li>-form ordered pairs.</li> <li>-graph the ordered pairs on a coordinate plane.</li> </ul> | <p>Students work in pairs, each using hundred charts and clear counters to locate numbers that follow specified patterns (e.g., Add 10 for student A; Add 5 for student B). Students cover numbers that follow the patterns up to the 5th term on respective hundred charts. Students write numbers from patterns on T-charts and compare terms with the same input values to draw conclusions about patterns.</p> <p>Students work in pairs and generate the results of two patterns using different multiplication rules (e.g., Multiply by 2; Multiply by 4 using input values of 0-5). Students make T-charts showing the</p> | <p><a href="#">Coordinate Powerpoint BattleGraph</a></p> <p><a href="#">Coordinate Bingo</a></p> <p><a href="#">Finding Patterns using Fractals</a></p> |

**x Look for and express regularity in repeated reasoning.**

**I will.....**

- describe the pattern.
- extend the pattern to formulate the rules.
- explain how to write an ordered pair.
- identify the relationship of the ordered pair.
- identify the ordered pairs using the table.
- explain how the numbers in the ordered pair are graphed on the coordinate plane.
- plot the ordered pair on a coordinate plane.

values and discuss relationships between corresponding terms. Using circular magnets to show each point, students graph ordered pairs on large poster-sized coordinate planes. Students discuss graphs and patterns found in corresponding terms.

Students create two numerical patterns using the illustration tools for two given rules. For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

Coordinate Grid Battleship: Have students place battleships in the first quadrant. Each student will have an opponent. The opposing student will call out ordered pairs in an attempt to have a successful hit on their opponent’s battle ship (hit or miss, based on the coordinate landing in the “water” or actually landing on the location of a battleship). The first student to sink their opponent’s battleship(s) wins. \*\*Adjust your scale appropriately depending upon the number of ships you are allowing.

Given two rules with an apparent relationship, students should be able to identify the relationship between the resulting sequences of the terms in one sequence to the corresponding terms in the other sequence. For example, starting with 0, multiply by 4 and starting with 0, multiply by 8 and generate each sequence of numbers (0, 4, 8, 12, 16, ...) and (0, 8, 16, 24, 32,...). Students should see that the terms in the second sequence are double the terms in the first sequence, or that the terms in the first sequence are half the terms in the second sequence.