

# 5 5th Grade Unit 5

<b>Unit Title: Algebraic Thinking and the Coordinate Plane- Expressions, Graphing Points, Patterns, and Relationships</b>	<b>Estimated Time</b>
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Essential Standards: 5.OA.1, 5.OA.2, 5.OA.3, 5.G.1, 5.G.2  
 Supporting Standards: N/A  
[End of Unit Common Assessment](#)

FCPS Supporting Links	Additional Supporting Links
<p style="text-align: center;"><a href="#">Pacing Guide</a></p> <p style="text-align: center;"><a href="#">Standards Progression</a></p> <p style="text-align: center;"><a href="#">FCPS Math Guidance Document</a></p> <p style="text-align: center;"><a href="#">Elementary Intellectual Preparation Cycle</a></p> <p style="text-align: center;"><a href="#">Trauma-Informed Strategies</a></p>	<p style="text-align: center;"><a href="#">Unit 1</a> <a href="#">Unit 2</a> <a href="#">Unit 3</a> <a href="#">Unit 4</a> Unit 5</p> <p style="text-align: center;"><a href="#">CRA Examples</a> (concrete, representational, &amp; abstract)</p> <p style="text-align: center;"><a href="#">Unit 5: Unit Flow &amp; Progression Video</a> *Must be logged into i-Ready to access this link</p>
<p style="text-align: center;"><a href="#">Kentucky Academic Standards KSA Blueprint</a></p> <p style="text-align: center;"><a href="#">Achieve the Core Progression Documents</a></p> <ul style="list-style-type: none"> <li>• <a href="#">Operations and Algebraic Thinking</a></li> <li>• <a href="#">Geometry</a></li> </ul> <p style="text-align: center;"><a href="#">Literary Connections</a></p> <p style="text-align: center;"><a href="#">Target of the Standards</a> - conceptual, procedural</p> <p style="text-align: center;"><a href="#">Multilingual Glossary</a></p> <p style="text-align: center;"><a href="#">Illustrated Vocabulary Cards</a></p> <p style="text-align: center;"><a href="#">Unit 5 Language Support for English Learners</a></p> <p style="text-align: center;"><a href="#">Manipulative List*</a> *Must be logged into i-Ready to access this link.</p>	

**Big Ideas**

- Evaluating, writing, and interpreting expressions is dependent on knowing how to use grouping symbols and the order of operations.
- Solve real-world and mathematical problems using the coordinate plane

*\*For more information, view the [Math Background pages 621m-621p](#) in the Teacher’s Guide (must be logged into i-Ready)*

Essential Questions	Common Preconceptions/Misconceptions
<p>How does using grouping symbols correctly and the order of operations help to evaluate, write, and interpret expressions?</p> <p>How can data be represented on a coordinate plane?</p> <p>When data is displayed on a coordinate plane, what story does that data tell?</p>	<ul style="list-style-type: none"> <li>• Students may move from left to right when evaluating expressions, ignoring grouping symbols.</li> <li>• Students may reverse the order of operations when plotting points, or when recording data. The order of the coordinates needs to be maintained.</li> </ul>

<b>Standards for Mathematical Practices</b>	<b>Kentucky Interdisciplinary Literacy Practices</b>
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<p><a href="#">MP.1. Make sense of problems and persevere in solving them.</a>  <a href="#">MP.2. Reason abstractly and quantitatively.</a>  <a href="#">MP.3. Construct viable arguments and critique the reasoning of others.</a>  <a href="#">MP.4. Model with mathematics.</a>  <a href="#">MP.5. Use appropriate tools strategically.</a>  <a href="#">MP.6. Attend to precision.</a>  <a href="#">MP.7. Look for and make use of structure.</a>  <a href="#">MP.8. Look for and express regularity in repeated reasoning.</a></p>	<ol style="list-style-type: none"> <li>1. Recognize that text is anything that com</li> <li>2. Employ, develop, and refine schema to u</li> <li>3. View literacy experiences as transaction</li> <li>4. Utilize receptive and expressive languag</li> <li>5. Apply strategic practices, with scaffoldin</li> <li>6. Collaborate with others to create new m</li> <li>7. Utilize digital resources to learn and shar</li> <li>8. Engage in specialized, discipline-specifi</li> <li>9. Apply high-level cognitive processes to</li> <li>10. Develop a literacy identity that promotes</li> </ol>
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<p><b>Essential Standards</b></p>	<p><b>Sample Learning Intentions &amp; Success Criteria</b></p>
<p style="text-align: right;"> <span style="color: red;">!</span> Indicates a misalignment with Kentucky  <span style="color: green;">◆</span> Indicates a consideration for         </p>	

**Cluster: Write and interpret numerical expressions.**

<p><b>KY.5.OA.1 Use parentheses, brackets or braces in numerical expressions and evaluate expressions that include symbols.</b>  <b>MP.1, MP.3</b></p> <p><input type="checkbox"/> Conceptual    <input type="checkbox"/> Procedural    <input type="checkbox"/> Application</p> <p>Students work with the order of first evaluating terms in parentheses, then brackets, [] and then braces, {}.</p> <p>Coherence KY.5.OA.1→ <a href="#">KY.6.EE.2</a></p>	<p>We are learning to use order of operations so we can solve a given problem.</p> <p>I know I'm successful when:</p> <ul style="list-style-type: none"> <li>• I can use order of operations to evaluate expressions.</li> <li>• I can evaluate expressions with parentheses, brackets and braces.</li> <li>• I can place parentheses, brackets, and/or braces to make a given equation true and justify their placement.</li> </ul>
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<p><b>KY.5.OA.2 Write simple expressions with numbers and interpret numerical expressions without evaluating them.</b>  <b>MP.2, MP.7</b></p> <p><input type="checkbox"/> Conceptual    <input type="checkbox"/> Procedural    <input type="checkbox"/> Application</p> <p>Students translate from words “add 8 and 7, then multiply by 2 to 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.</p> <p>Coherence <a href="#">KY.4.OA.1</a>→ KY.5.OA.2→<a href="#">KY.6.EE.3</a>, <a href="#">KY.6.EE.4</a>  <a href="#">KY.6.EE.2</a></p>	<p>We are learning to interpret numerical expressions so we can write numerical expressions.</p> <p>I know I'm successful when:</p> <ul style="list-style-type: none"> <li>• I can write a numerical expression when given a written expression.</li> <li>• I can interpret numerical expression without evaluating them.</li> </ul>
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### Attending to the Standards for Mathematical Practice

Students move between words and symbols, understanding equivalent ways to express a statement. Students in sum of 347, 124 and 99, divided by 30 as,  $(347 + 124 + 99) \div 30$  and as  $\frac{347 + 124 + 99}{30}$  (MP.7). As they evaluate such there are options within the order of operations. In this expression, they add the three values and then divide by 30 and get the same answer. They think of a context to convince themselves that two options will lead to the same case, students consider the two options and see the first idea is less ‘messy’ and therefore, a good choice (MP.1).

### Cluster: Analyze patterns and relationships.

#### KY.5.OA.3 Generate numerical patterns for situations.

a. Generate a rule for growing patterns, identifying the relationship between corresponding terms (x, y).

b. Generate patterns using one or two given rules (x, y).

c. Use tables, ordered pairs and graphs to represent the relationship between the quantities. MP.2, MP.4

Conceptual     Procedural     Application

Given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, students generate terms in the resulting sequences (creating ordered pairs). Students observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so. Graph the ordered pairs on a coordinate plane.

Coherence [KY.4.OA.5](#) → KY.5.OA.3 → [KY.6.EE.9](#)

We are learning to generate numerical patterns for situations so we can represent the relationship of quantities using tables, ordered pairs, and graphs.

I know I am successful when:

- I can generate a rule for a growing pattern and identify the relationship between the terms.
- I can generate a pattern when given one or two rules.
- I can use tables, ordered pairs and graphs to represent the relationship between quantities.

### Attending to the Standards for Mathematical Practice

Students notice when they apply a rule, like add 3, several patterns emerge. The explicit pattern is the new value value. But, as they explore they notice if they pick an input that is 5 more than the last input, then the output is also about this contextually, for example thinking of people ages in three years. So, if they have a sibling that is 5 years they will still be 5 years older (MP.2). They represent these patterns on graphs and use the graphs to make sense

### Cluster: Graph points on the coordinate plane to solve real-world and mathematical problems.

**KY.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. MP.4, MP.7**

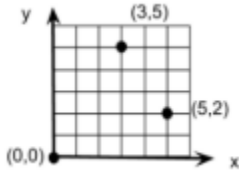
Conceptual     Procedural     Application

This standard pertains to the first quadrant only which limits to positive ordered pairs only

We are learning about the coordinate system so we can plot points on the x- and y-axis.

I know I’m successful when:

- I can identify the x-axis and y-axis in the first quadrant of a coordinate plane.
- I can identify the origin of a coordinate plane.
- I can plot a point in the coordinate plane given its x- and y-coordinates

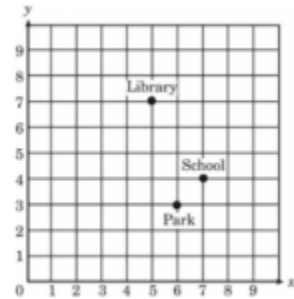


Coherence KY.5.G.1→[KY.6.NS.6](#)

**KY.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. MP.1, MP.6**

- Conceptual     Procedural     Application

For example, students use the coordinate grid, which ordered pair represents locations of places or objects.



Coherence KY.5.G.2→[KY.6.G.3](#), [KY.6.NS.8](#)

We are learning to graph points on a coordinate grid/plane so that we can represent real-world situations.

I know I'm successful when:

- I can identify a pattern within the context of a real-world situation.
- I can use the pattern to graph points on a coordinate plane/grid.
- I can explain how the points relate to the context of a real-world situation.

**Attending to the Standards for Mathematical Practice**

Students notice a coordinate axis, is in fact, coordinating a horizontal number line with a vertical number line (MP.1). The title, scale and a label in order to be understood by a reader (MP.6). Students record data in their graph from exploring a pattern (MP.4). For example, students graph data from a two-column table that shows the cost of buying pineapples (one pineapple costs \$2, three pineapples cost \$6) and use the coordinate axis to explain what they notice about the relationship between the number of pineapples and the cost of pineapples (MP.1).