

Standards for Mathematical Practice

[MP.1.](#) Make sense of problems and persevere in solving them.
[MP.2.](#) Reason abstractly and quantitatively.
[MP.3.](#) Construct viable arguments and critique the reasoning of others.
[MP.4.](#) Model with mathematics.

[MP.5.](#) Use appropriate tools strategically.
[MP.6.](#) Attend to precision.
[MP.7.](#) Look for and make use of structure.
[MP.8.](#) Look for and express regularity in repeated reasoning.

Standard	Clarifications
<p>KY.8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.</p> <p><i>Alternate Assessment Target: Limit coordinates of ordered pairs negative 20 to 20.</i></p>	<p>Students understand the reasoning that not all relations are functions. Note: Function notation is not required in grade 8.</p> <p>FROM North Carolina Unpacked, p.9, go there to see a “Check for Understanding” prompt: <i>This standard starts to develop the definition of a function as a rule that produces a unique output for each input. This understanding has been building through students' work with ratio and proportional relationships. In 8th grade, functions will be represented as tables, graphs, and equations. Function notation is not an expectation in 8th grade. Recognizing functions from graphs, tables, or a set of ordered pairs. Students identify graphs, tables or a set of ordered pairs that represent a function. These graphs, tables, and ordered pairs can represent nonlinear functions as well as linear functions. Students justify their reasoning using the definition of a function and characteristics from different representations of the function. If the students are exposed to the vertical line test, the students are expected to explain why it works.</i></p> <p>Alternate Assessment Clarification: NA</p>
Connections to Math Practices	Coherence/Foundational Understandings
<p>MP.7 Look for and make use of structure. (Simplify problems by using their structure.*)</p> <p>MP.8 Look for and express regularity in repeated reasoning. (Simplify problems by noticing patterns.*)</p> <p>Key Vocabulary: function, graph, ordered pairs, (x,y), point, input, output, coordinate, coordinate plane, quadrant, domain, range</p> <p>Click here to see more about what teachers and students do to build the math practices: Engaging the Math Practices and Question Stems</p>	<p>Pre-requisite Skills</p> <ul style="list-style-type: none"> Recognize and interpret ordered pairs Graph ordered pairs in quadrants I and II with number between negative 20 and 20 Make a table of x and y values Integers between -20 and 20 <p>KY.7.RP.2</p> <p>Coherence KY.8.F.1→ KY.HS.F.1</p> <p>Kentucky Academic Standards for Mathematics</p>

*Clarification from Kaplinsky, R. (2018, November 18). [Making the Math Practices Readable](#).

Instructional Considerations

Possible Areas of Difficulties/Misconceptions

- Students will mix up x- and y-axes on the coordinate plane, or mix up the ordered pairs. When emphasizing that the first value is plotted on the horizontal axes (usually x, with positive to the right) and the second is the vertical axis (usually called y, with positive up), point out that this is merely a convention: It could have been otherwise, but it is very useful for people to agree on a standard customary practice.
- Students will mistakenly think of a straight line as horizontal or vertical only.
- Students may mistakenly believe that a slope of zero is the same as “no slope” and then confuse a horizontal line (slope of zero) with a vertical line (undefined slope). Confuse the meaning of “domain” and “range” of a function.
- Students will mix up x- and y-axes on the coordinate plane, or mix up the ordered pairs. When emphasizing that the first value is plotted on the horizontal axes (usually x, with positive to the right) and the second is the vertical axis (usually called y, with positive up), point out that this is merely a convention: It could have been otherwise, but it is very useful for people to agree on a standard customary practice.

Suggested Tools/Visual Aids

- [KY Alternate Assessment Resource Guide](#) (General terms pps 6-11; Math terms pps 22-26)
- Graph paper with coordinate planes (quadrants I and II)
- Square tiles, connecting cubes, centimeter cubes (any square manipulative that could transfer to grid paper)
- [NAGS Graphic Organizer](#)
- Graphing Calculator (Desmos or other)
- Plane Geoboards and beads

Other Considerations

- Students would benefit from recognizing functions (or non-functions) in the form of graphs, tables, and a set of ordered pairs.
- Consider using a story like *Two of Everything* (a doubling pattern book) to help students visualize a function.
- Connections to real-world contexts (word problems) can help students make meaning of what the linear function actually represents.

Additional Resources

- Kaplinsky, R. (2018, November 18). *Making the Math Practices Readable*. <https://robertkaplinsky.com/?s=revised+math+practices>.
- New York State Education Department. (2014). *Engage New York Modules: 8th Grade Mathematics*. <https://www.engageny.org/resource/grade-8-mathematics>
- North Carolina Department of Public Instruction. (2018, June). *8th Grade Math Instructional Support Tools*. <https://files.nc.gov/dpi/documents/curriculum/mathematics/scos/current/8th-unpacking.pdf>
- Van de Walle, J.A., Karp, K.S., Bay-Williams, J.M., Wray, J. & Nicole Rigelman, N. (2018). *Elementary and Middle School Mathematics: Teaching Developmentally (10th Edition)*. Pearson.