## M.EE.A-REI.10-12

**Math: High School**

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<th>Grade-Level Standard</th>
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<td><strong>M.A-REI.10</strong> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line); <strong>M.A-REI.11</strong> Explain why the x-coordinates of the points where the graphs of the equations ( y = f(x) ) and ( y = g(x) ) intersect are the solutions of the equation ( f(x) = g(x) ); find the solutions approximately; <strong>M.A-REI.12</strong> Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes</td>
<td><strong>M.EE.A-REI.10-12</strong> Interpret the meaning of a point on the graph of a line. For example, on a graph of pizza purchases, trace the graph to a point and tell the number of pizzas purchased and the total cost of the pizzas</td>
<td><strong>Initial Precursor</strong>&lt;br&gt;• Arrange objects in pairs&lt;br&gt;• Order objects&lt;br&gt;<strong>Distal Precursor</strong>&lt;br&gt;• Explain coordinate pairs (ordered pairs)&lt;br&gt;• Explain x-coordinate&lt;br&gt;• Explain y-coordinate&lt;br&gt;<strong>Proximal Precursor</strong>&lt;br&gt;• Recognize covariation&lt;br&gt;• Recognize direction of covariation&lt;br&gt;• Describe rate of change in a graph&lt;br&gt;<strong>Target</strong>&lt;br&gt;• Analyze linear function graphs&lt;br&gt;• Interpret a point on the graph of a linear function&lt;br&gt;<strong>Successor</strong>&lt;br&gt;• Solve real-world problems by interpreting linear function graphs</td>
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| How is the Initial Precursor related to the Target? | How is the Distal Precursor related to the Target? |
|---------------------------------------------|-------------------------------------------------
| **Initial Precursor:** In order to analyze function graphs, students begin by learning to notice what is new. The educator draws the students attention to new objects or stimuli, labels them (e.g., “this set has all red objects; this set has all blue,” “these fidgets are big; these fidgets are small”), and the student observes, feels, or otherwise interacts with them. Educators encourage students to begin placing like objects together, drawing attention to the characteristics that make an item the same or different. Educators provide sorting activities that allow learners to isolate specific attributes while recognizing likenesses and differences among objects. Educators also provide activities that reinforce the skill of ordering (e.g., arrangement of objects from largest to smallest, sequencing daily events, and counting). | **Distal Precursor:** As students’ attention to objects and details develops, educators can extend their attention by providing experience with finding and creating simple patterns using objects and moving to symbols (e.g., numerals). Educators should take care to start with simple patterns (e.g., 1-2-1-2) and take advantage of the symbols that are already being used in the classroom. Educators should demonstrate how students can create and identify the pattern/rule (e.g., using colored cubes, the student creates a line of 5 cubes; the educator then creates a matching set and explains what to do to follow the student’s pattern. Then, the student generates a third matching set. If the order is not followed, it is a good teaching opportunity to talk about why it doesn’t fit the pattern). Learning to identify the rule of patterns will help students extend their thinking across patterns. As students are working on identifying pattern rules, educators can also begin to demonstrate how rules can be used with ordered pairs. Provide students lots of opportunities to apply rules to create their own examples of ordered pairs. Educators should demonstrate how students can use their counting skills to figure out where to mark the point by counting how far along and how far up the x- and y-axes. |

A diagram showing the relationship of nodes in the mini-map appears below.

**Key to map codes in upper right corner of node boxes:**

- IP Initial Precursor
- SP Supporting
- DP Distal Precursor
- S Successor
- PP Proximal Precursor
- UN Untested
- T Target
Interpret the meaning of a point on the graph of a line.