**Unpacking a Standard**

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| **Standard:** | | | | |
| What do students have to know and be able to do? | How will they do it? | What specific guidelines or parameters will they follow? | What representations will be used? | What vocabulary will be new to students? |
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| What are students’ common misconceptions? | | | | |

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| **SOL A.6c (Graphing Linear Equations)**  **A.6 The student will**  **a) determine the slope of a line when given an equation of the line, the graph of the line, or two points on the line:**  **b) write the equation of a line when given the graph of the line, two points on the line, or the slope and a point on the line; and**  **c) graph linear equations in two variables.** | | | | |
| **What do students have to know and be able to do?** | **How will they do it?** | **What specific guidelines or parameters will they follow?** | **What representations will be used?** | **What vocabulary will be new to students?** |
| * Graph a linear equation in two variables, including those that arise from a variety of practical situations. | * Plotting points * Using whiteboard graphs * Graphing lines * Translating verbal form to symbolic - algebraic equation * Use graphing calculator to model equations | * Includes vertical lines * Equations may be written in various forms, including standard form, slope-intercept form, or point-slope form. | * 5*x* + *y* = 4 * y + 6 = -5(x – 2) | * What is linear? * Solving for *y* * What are intercepts? * Standard form * Slope-intercept form * Point-slope form * What is slope? * Write equation from given “situation” |
| * Use the parent function *y = x* and describe transformations defined by changes in slope or  *y*-intercept. | * Introduce f(x) and changes in slope and y-intercept * Calculator Investigation *y = x* * (comparing to second line making changes to m and b) * Transform App  (*y* = Ax + B) * Desmos modeling * Graph paper * White boards * Graphing calculators * Manipulatives: wiki sticks | * Transformations can be described using words, a graph, or an equation. * Function notation may be used | * Given the parent function   f(*x*) = *x*, which equation(s) represent f(*x*) + 3?  f(*x*) = *x* + 3  f(*x*) = 3*x*  f(*x*)= *x* – 3  f(*x*)= 3*x* + 3   * Given a graph of f(*x*) – 2, plot 2 points found on the parent function f(*x*) * (graph of *y*=-*x*+2) | * Parent function (*y = x*) * Up/down of y-intercept * How slope changes with integers and fractions * Slope * Parent function * Transformation * Translation * Reflection * Dilation |
| What are students’ common misconceptions?  Solving for y; Plotting points (*x, y*) or (*y, x*); Using different scales for graph; Which is *x*? Which is *y*?; When using slope to find additional points that don’t fit on a graph, knowing you could go in opposite direction as well; Translation up, down, left or right only affects y-intercept; Meaning of slope in a context; Meaning of y-intercept in a context; Translating from a practical situation to an algebraic representation | | | | |