

## Empowerment Academy Plan: UP Academy

The content recommendations for UP Academy are based on a combination of analysis for the major work of each grade, along with assessment data unique to the school. The major content clusters, rather than “supporting” and “additional” clusters, of the grade should constitute 65%-85% of instruction for the year and focusing Empowerment Academy content on these clusters bolsters our support significantly, particularly since we know a high percentage of students progress through the winter and spring with unfinished learning in these clusters. Additionally, this plan is predicated on grade level item analysis for the school from the 2017 MCAS, along with analysis of NWEA MAP low to low-average performance percentiles (<40<sup>th</sup> percentile) across four math domains. As a result of this combined analysis, the following standards are recommended for focus during the 2018 UP Academy Empowerment Academy for **mathematics**:

### Content Standard Focus: Expressions and Equations

#### Grade 6

6.EE.1.02  
6.EE.1.03  
6.EE.2.05  
6.EE.2.06  
6.EE.2.07  
6.EE.2.08  
6.EE.3.09

- 1. Apply and extend previous understandings of arithmetic to algebraic expressions.*
  2. Write, read, and evaluate expressions in which letters stand for numbers.
  3. Apply the properties of operations to generate equivalent expressions.
- 2. Reason about and solve one-variable equations and inequalities.*
  5. Understand solving an equation or inequality as a process of answering a question: Which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
  6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
  7. Solve real-world and mathematical problems by writing and solving equations of the form  $x + p = q$  and  $px = q$  for cases in which  $p$ ,  $q$ , and  $x$  are all nonnegative rational numbers.
  8. Write an inequality of the form  $x > c$  or  $x < c$  to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form  $x > c$  or  $x < c$  have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
- 3. Represent and analyze quantitative relationships between dependent and independent variables.*

9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

### Grade 7

7.EE.1.02  
7.EE.2.03  
7.EE.2.04

- 1. Use properties of operations to generate equivalent expressions.*
2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
- 2. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.*
3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

### Grade 8

8.EE.1.03  
8.EE.1.04  
8.EE.2.05  
8.EE.2.06  
8.EE.3.07  
8.EE.3.08

- 1. Work with radicals and integer exponents.*
3. Use numbers expressed in the form of a single digit multiplied by an integer power of 10 to estimate very large or very small quantities, and express how many times as much one is than the other.
4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
- 2. Understand the connections between proportional relationships, lines, and linear equations.*
5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
6. Use similar triangles to explain why the slope  $m$  is the same between any two distinct points on a non-vertical line in the coordinate plane. Derive the equation  $y = mx$  for a line through the origin and the equation  $y = mx + b$  for a line intercepting the vertical axis at  $b$ .
- 3. Analyze and solve linear equations and pairs of simultaneous linear equations.*
7. Solve linear equations in one variable.
8. Analyze and solve pairs of simultaneous linear equations.