# Power Standards

## "I can" Checklist for students

## Grade 8

| ☑ | Required skills by the end of Grade 8 |
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| | I can simplify expressions with integer exponents |
| | I can use proportional relationships to solve real-world problems |
| | I can solve simple equations involving squares and cubes |
| | I can evaluate the square roots of small perfect squares |
| | I can evaluate the cube roots of small perfect cubes |
| | I can identify irrational numbers |
| | I can express very large and small numbers in scientific notation |
| | I can determine the proportional difference between scientific numbers |
| | I can add, subtract, multiply, and divide combinations of numbers in scientific notation |
| | I can appropriately use scientific notation and units of measurement in real-world situations |
| | I can explain scientific notation generated by technology |
| | I can explain proportional relationships with a graph |
| | I can compare two proportional relationships when one is a graph and the other an equation |
| | I can explain the constant slope of a line using points on the line and similar triangles |
| | I can determine the equation of a line given on a coordinate graph |
| | I can classify linear equations that have one solution, infinite solutions, and no solutions<br>I can solve any linear equation with rational numbers |
| | I can explain how a solution to a pair of simultaneous equations relates to the intersection of their graphs |
| | I can solve a system of linear equations algebraically and graphically |
| | I can determine solutions or special conditions to simple simultaneous linear equations mentally |
| | I can solve real-world problems using simultaneous equations |
| | I can define and explain what a function is and how it relates to input/output tables in earlier grades |
| | I can explain how the graph of a function relates to inputs and outputs |
| | I can name and explain the various properties of a function (i.e., slope, rate, degree, shape of graph, etc.) |
| | I can compare the properties of two functions that are displayed in different ways (i.e., equation, graph, table, or words) |
| | I can rewrite linear equations in the form of $y = mx + b$ |
| | I can explain how the terms m and b in the equation $y = mx + b$ relate to the graph |
| | I can generate functions that are not linear and explain why they are not linear |
| | I can create an algebraic linear function when given a relationship between two quantities |
| | I can determine the rate of change when given a linear relationship shown by a table or graph |
| | I can determine the initial value when given a linear relationship shown by a table or graph |
| | I can explain what the rate of change means when given a linear relationship in a real-world situation |
| | I can explain what the initial value means when given a linear relationship in a real-world situation |
| | I can describe where a graph is increasing, decreasing, constant, linear, and nonlinear |
| | I can sketch a graph given a location and if it is increasing, decreasing, constant, linear, and nonlinear |
| | I can demonstrate and explain what happens to a line when it is rotated, reflected, and translated by various amounts |
| | I can explain how two geometric figures are congruent when the first is rotated, reflected, or translated to obtain the second |
| | I can specifically name the rotation, reflection, or translation of one geometric figure necessary to obtain the second congruent figure |
| | I can explain the effect of a dilation, translation, rotation, and reflection on a figure on a coordinate plane using new coordinates to describe the result of the action |
| | I can explain how two geometric figures are similar when the first is dilated, rotated, reflected, or translated to obtain the second |

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|---|---|
| | I can specifically name the dilation, rotation, reflection, or translation of one geometric figure necessary to obtain the second similar figure |
| | I can defend (verbal or written) an argument about the exterior angles of a triangle adding up to 360° and/or that the exterior and interior angles adding to 180° |
| | I can defend (verbal or written) an argument about the interior angles of a triangle adding up to 180° |
| | I can explain (verbal or written) the relationship between all the angles formed by parallel lines cut by a transversal |
| | I can explain (verbal or written) the relationship between all the angles of two similar triangles |
| | I can explain at least one method of proof of the Pythagorean Theorem |
| | I can explain a proof of the converse of the Pythagorean Theorem which says, if the square root of one side of a triangle is equal to the sum of the squares of the other two sides, then the triangle is a right triangle |
| | I can solve real-world problems using the Pythagorean Theorem on two-dimensional and three-dimensional figures |
| | I can find the distance between two points on a coordinate plane |

## Mathematical Practices for ALL grade levels

| ☑ | **I do statement** | **Mathematical Practice** |
|---|---|---|
| | I do try different strategies when I get stuck and never quit! | Make sense of problems and persevere in solving them. |
| | I do think about my answer to see if it makes sense. | Reason abstractly and quantitatively. |
| | I do explain my thinking using math vocabulary. | Construct viable arguments and critique the reasoning of others. |
| | I do draw diagrams and pictures that help me solve problems. | Model with mathematics. |
| | I do use the most appropriate tools (rulers, number lines, ten-frames, calculators, etc.) when solving problems | Use appropriate tools strategically. |
| | I do check my work when I finish. | Attend to precision. |
| | I do organize my work to allow myself to make valuable observations. | Look for and make use of structure. |
| | I do look for patterns and apply these patterns to solve problems. | Look for and express regularity in repeated reasoning. |