Student Baseline and Post-Instruction Checklist
Common Core Essential Elements and Instructional Achievement Level Descriptors
Mathematics Grade 8

Student Name: _____   Student Grade: _____
Teacher: _____   Date: _____

Common Core State Standard: 8.NS.1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.NS.1. Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends that may be greater than one.	____Y _____N
Level III	Student demonstrates the content knowledge and skills: • Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.	____Y _____N
Level II	Student demonstrates some of the content knowledge and skills: • Use models to subtract halves, thirds, and fourths.	____Y _____N
Level I	Student attempts to perform the task with support: • Use models to identify the whole and find the missing pieces of a whole using halves.	____Y _____N

Common Core State Standard: 8.NS.2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

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Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.NS.2. Represent different forms and values of decimal numbers using fractions with numerators that are multiples of five and a denominator of 100.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Represent different forms and values of decimal numbers to the hundreds place (decimal, fraction, hundreds grid, and money representation).	____Y ـ____N
Level III	Student demonstrates the content knowledge and skills: • Represent different forms and values of decimal numbers using fractions with numerators that are multiples of five and a denominator of 100.	____Y ـ____N
Level II	Student demonstrates some of the content knowledge and skills: • Distinguish between a part represented by a decimal and a whole number without decimals.	____Y ـ____N
Level I	Student attempts to perform the task <u>with support</u>: • Identify a part of a whole in concrete real-world objects.	____Y ـ____N

Common Core State Standard: 8.EE.1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

8.EE.2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = $ p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.

8.EE.3. Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger.*

8.EE.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.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.EE.1-4. Compose and decompose numbers to three digits.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Use powers of 10 to compose and decompose numbers.	**____Y _____N**
Level III	Student demonstrates the content knowledge and skills: • Compose and decompose numbers to three digits.	**____Y _____N**
Level II	Student demonstrates some of the content knowledge and skills: • Use models to represent the composition of numbers.	**____Y _____N**
Level I	Student attempts to perform the task <u>with support:</u> • Recognize the specific value a number represents.	**____Y _____N**

Common Core State Standard: 8.EE.5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.EE.5-6. Graph a simple ratio using the x and y axis points when given the ratio in standard form (2:1) and convert to 2/1.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Graph a simple ratio using the x and y axis points when given the ratio in standard form (2:1) and expand on the ratio by two or more points.	**____Y _____N**

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Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
Level III	Student demonstrates the content knowledge and skills: • Graph a simple ratio using the x and y axis points when given the ratio in standard form (2:1) and convert to 2/1.	**____Y _____N**
Level II	Student demonstrates some of the content knowledge and skills: • Identify a specific data point when given the coordinates.	**____Y _____N**
Level I	Student attempts to perform the task <u>with support:</u> • Place or locate data on a simple two-category graph.	**____Y _____N**

Common Core State Standard: 8.EE.7. Solve linear equations in one variable.
- Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
- Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.EE.7. Solve algebraic expressions using simple addition and subtraction.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Solve algebraic expressions using two-digit addition and subtraction.	**____Y _____N**
Level III	Student demonstrates the content knowledge and skills: • Solve algebraic expressions using simple addition and subtraction.	**____Y _____N**
Level II	Student demonstrates some of the content knowledge and skills: • Solve simple addition and subtraction problems.	**____Y _____N**

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
Level I	Student attempts to perform the task with support: • Distinguish between a letter and a number.	**____Y _____N**

Common Core State Standard: 8.EE.8. Analyze and solve pairs of simultaneous linear equations.
- Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
- Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.*
- Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.EE.8. N/A (See EE.8.EE.5-6)		**Indicate Yes or No**

Common Core State Standard: 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.[1]

8.F.2. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

8.F.3. Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.F.1-3. Given a function table, identify the missing		**Indicate Yes or No**

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[1] Function notation is not required in Grade 8.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
number.		
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Given a function table, identify the rule and express the rule for the missing variable (e.g., n times 2).	**____Y _____N**
Level III	Student demonstrates the content knowledge and skills: • Given a function table, identify the missing number.	**____Y _____N**
Level II	Student demonstrates some of the content knowledge and skills: • Identify the relationship between two numbers.	**____Y _____N**
Level I	Student attempts to perform the task <u>with support:</u> • Given a sequence, match the element of a sequence.	**____Y _____N**

Common Core State Standard: 8.F.4. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x, y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.F.4. Determine the values or rule of a function using a graph or a table.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Given the input values and a rule, complete the output.	**____Y _____N**
Level III	Student demonstrates the content knowledge and skills: • Determine the values or rule of a function using a graph or a table.	**____Y _____N**
Level II	Student demonstrates some of the content knowledge and skills: • Navigate, read, use, or apply a graph or table.	**____Y _____N**

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
Level I	Student attempts to perform the task with support: • Identify the different parts of a graph or a table.	____Y _____N

Common Core State Standard: 8.F.5. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.F.5. Describe how a graph represents a relationship between two quantities.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Describe how a graph represents a relationship between two quantities and use the graph to answer questions using that relationship.	____Y _____N
Level III	Student demonstrates the content knowledge and skills: • Describe how a graph represents a relationship between two quantities.	____Y _____N
Level II	Student demonstrates some of the content knowledge and skills: • Answer questions about data from a graph.	____Y _____N
Level I	Student attempts to perform the task with support: • Place data in a graph.	____Y _____N

Common Core State Standard: 8.G.1. Verify experimentally the properties of rotations, reflections, and translations:
a. Lines are taken to lines, and line segments to line segments of the same length.
b. Angles are taken to angles of the same measure.
c. Parallel lines are taken to parallel lines.

8.G.2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

8.G.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.G.1-3. Identify similarity and congruence (same) in objects and shapes containing angles without translations.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • N/A	**____Y _____N**
Level III	Student demonstrates the content knowledge and skills: • Identify similarity and congruence (same) in objects and shapes containing angles without translations.	**____Y _____N**
Level II	Student demonstrates some of the content knowledge and skills: • Match similar shapes.	**____Y _____N**
Level I	Student attempts to perform the task <u>with support</u>: • Match shapes using a three-dimensional object.	**____Y _____N**

Common Core State Standard: 8.G.4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.G.4. Identify similar shapes with and without rotation.		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Determine if geometric shapes are similar with rotations or reflections.	**____Y _____N**
Level III	Student demonstrates the content knowledge and skills: • Identify similar shapes with and without rotation.	**____Y _____N**

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
Level II	Student demonstrates some of the content knowledge and skills: • Identify similar geometric shapes.	____Y _____N
Level I	Student attempts to perform the task <u>with support:</u> • Recognize geometric shapes.	____Y _____N

Common Core State Standard: 8.G.5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.G.5. Compare measures of angles to a right angle (greater than, less than, or equal to).		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Compare measures of angles formed by intersecting lines.	____Y _____N
Level III	Student demonstrates the content knowledge and skills: • Compare measures of angles to a right angle (greater than, less than, or equal to).	____Y _____N
Level II	Student demonstrates some of the content knowledge and skills: • Recognize a right angle.	____Y _____N
Level I	Student attempts to perform the task <u>with support:</u> • Recognize an angle.	____Y _____N

Common Core State Standard: 8.G.6. Explain a proof of the Pythagorean Theorem and its converse.

8.G.7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.G.8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

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EE8.G.6-8. N/A		**Indicate Yes or No**

Common Core State Standard: 8.G.9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.G.9. Identify volume of common measures (cups, pints, quarts, gallons, etc.).		**Indicate Yes or No**
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Apply knowledge of volume.	**____Y ـ____N**
Level III	Student demonstrates the content knowledge and skills: • Identify volume of common measures (cups, pints, gallons, etc.).	**____Y ـ____N**
Level II	Student demonstrates some of the content knowledge and skills: • Identify which is more or less.	**____Y ـ____N**
Level I	Student attempts to perform the task <u>with support:</u> • Experience volume.	**____Y ـ____N**

Common Core State Standard: 8.SP.1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

8.SP.2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

8.SP.3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of*

1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.SP.1-3. N/A		Indicate Yes or No

Common Core State Standard: 8.SP.4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*

Common Core Essential Elements - Math	Instructional Achievement Level Descriptors	Estimated Level of Student Proficiency
EE8.SP.4. Construct a graph or table from given categorical data and compare data categorized in the graph or table.		Indicate Yes or No
Level IV	Student demonstrates the content knowledge and skills at a higher level of complexity then described in Level 3: • Conduct an experiment, collect data, and construct a graph or table.	____Y ____N
Level III	Student demonstrates the content knowledge and skills: • Construct a graph or table from given categorical data and compare data categorized in the graph or table.	____Y ____N
Level II	Student demonstrates some of the content knowledge and skills: • Collect and organize data.	____Y ____N
Level I	Student attempts to perform the task with support: • Organize data into groups.	____Y ____N