Mathematics Grade 8
Number (N)

Outcome	1 - Beginning The student is having difficulty demonstrating an understanding of the concept.	2 – Approaching The student is developing an understanding of the concept.	3 – Meeting The student consistently demonstrates an understanding of the concept or has achieved the concept.	4- Exemplary The student independently demonstrates an in-depth understanding of the concept, and consistently applies this knowledge to new situations.
8N.1 **I can demonstrate understanding of the square and principle square root of whole numbers concretely or pictorially and symbolically.** **[CN, ME, R, T, V]**	• **With help**, I can represent the square **OR** square root of whole numbers using objects or pictures.	• I can recognize and represent the square **OR** square root of whole numbers using objects or pictures **AND** symbols.	• I can represent the square **AND** square root of whole numbers using objects **OR** pictures **AND** symbols, and explain my thinking.	• I can extend my understanding of squares **OR** square roots to include **representing** the square **OR** square root of **some positive rational numbers and explain my thinking**.
	• **With help**, I can apply **estimation strategies** to determine the approximate values for square roots.	• I can apply **estimation strategies** to determine the approximate values for square roots.	• I can apply **estimation strategies** to determine the approximate values for square roots, **and explain my thinking.**	• I can apply **estimation strategies** to determine the approximate values for square roots of **some positive rational numbers and explain my thinking.**
	• **With help**, I can determine square roots of perfect squares.	• I can determine square roots of whole numbers with or without the use of technology.	• I can **determine the square root of whole numbers** with or without the use of technology.	• I can show the application of square roots in real life situations.
Comments				

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8N.2 **I can expand and demonstrate understanding of percents greater than or equal to 100% (including fractional and decimal percents) concretely, pictorially, and symbolically. [CN, PS, R, V]**	• **With help**, I can represent percentages between 1% and 100% using objects, pictures **OR** symbols. • I can record the percentage of a quantity with percentages between 1% and 100%. • I can solve problems involving percentages between 1% and 100%.	• I can **represent percentages** between 1% and 100% using objects, pictures **OR** symbols. • I can record the percentage, fraction and decimal forms of a quantity with percentages between 1% and 100%. • I can solve problems involving percentages between 1% and 100% **and explain my thinking.**	• I can represent a fractional percent and a percentage greater than 100 using grid paper. • I can record the percentage, fraction and decimal forms of a quantity with fractional percentages and percentages greater than 100. • I can **solve problems** involving percentages </> 100% **and explain my thinking.**	• I can represent a fractional percent and a percentages greater than 100 in more than one way. • I can record the percentage, fraction and decimal forms of a quantity with fractional percentages and percentages greater than 100 and explain which representation is most appropriate for a given context. • I can solve **complex**, **multi-step** problems using analysis and decision making based upon percentages.

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8N.3 **I can demonstrate understanding of rates, ratios, and proportional reasoning concretely, pictorially, and symbolically. [C, CN, PS, R, V]**	• **With help**, I can explain the difference between part:part and part: whole ratios.	·• I can explain the difference between part:part and part: whole Ratios.	• I can explain the difference between part:part and part:whole ratios AND I can explain the connection between part:whole ratios and percentages, fractions and probability.	• I can, using personal situations, verify or contradict the use of ratios and rates in the given situation.
	• I can identify the difference between ratios and rates.	• I can explain the difference between ratios (including percentages, probability, fractions) and rates.	• I can explain the difference between ratios (including percentages, probability, fractions) and rates AND determine which is needed in a given context.	• I can explain the difference between ratios (including percentages, probability, fractions) and rates AND create contexts where each exist.
	• I can write the ratios AND rates using numbers AND symbols from a concrete or pictorial representation.	• I can recognize, write and simplify ratios AND rates using numbers and symbols from simple word problems.	·• I can solve problems involving ratios AND rates from real life situations in various forms using proportional reasoning.	• I can recognize, create and solve problems from personal situations using ratios, rates and proportional reasoning.

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Comments				
8N.4 **I can demonstrate understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially, and symbolically.** **[C, CN, ME, PS]**	• **With help**, I can show how to multiply common fractions using objects, pictures, **OR** symbols.	• I can show how to multiply common fractions using objects, pictures, **OR** symbols.	• I can show how to **multiply common fractions** using objects, pictures, **AND** symbols, **use simplification strategies**, and **explain my reasoning.**	• I can show how to **efficiently** multiply common fractions using objects, pictures, and symbols and explain my reasoning.
	• **With help,** I can show how to multiply mixed numbers using objects, pictures, **OR** symbols.	• I can show how to multiply mixed numbers using objects, pictures, **OR** symbols.	• I can show how to **multiply mixed numbers** using objects, pictures, **AND** symbols, **use simplification strategies**, and explain my reasoning.	• I can show how to **efficiently** multiply mixed numbers using objects, pictures, and symbols.
	• **With help**, I can show how to divide common fractions using objects, pictures, **OR** symbols.	• I can show how to divide common fractions using objects, pictures, **OR** symbols.	• I can show how to **divide common fractions** using objects, pictures, **AND** symbols, **use simplification strategies**, and explain my reasoning.	• I can show how to **efficiently** divide common fractions using objects, pictures, and symbols.
	• **With help**, I can show how to divide mixed numbers using objects, pictures, **OR** symbols.	• I can show how to divide mixed numbers using objects, pictures, **OR** symbols.	• I can show how to divide mixed numbers using objects, pictures, **AND** symbols, **use simplification strategies**, and explain my reasoning.	• I can show how to **efficiently** divide mixed numbers using objects, pictures, and symbols.
	• With help, I can determine the important information in a problem involving fractions.	• I can **use symbols to represent significant quantities and operation**s in a problem.	• I can **solve word problems** involving fractions.	• I can solve word problems involving fractions, **AND** debate generalities such as "multiplication always results in a larger quantity and division always results in a smaller quantity."

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Comments				
8N.5 **I can demonstrate understanding of multiplication and division of integers concretely, pictorially, and symbolically.** **[C, CN, PS, R, V]**	• I can **identify the operation needed** in an integer problem.	• I can **solve integer problems** using all four operations.	• I can **create and solve** an integer problem, including problems using the order of operations.	• I can **create and solve complex multi-step integer problems**, including problems using the order of operations.
	• **With help** I can recognize the patterns for the sign of integer product **OR** quotient.	• I can recognize the patterns for the sign of integer product **OR** quotient.	• I can **recognize the pattern**s for the sign of integer product **AND** quotient.	• I can recognize and **explain** the patterns for the sign of integer product **AND** quotient.
	• With help I can divide integers using pictures, materials **OR** symbols.	• I can divide integers using pictures, materials **OR** symbols.	• I can **divide integers** using pictures, materials **AND** symbols.	• I can **apply division of integers to complex problems.**
	• With help I can multiply integers using pictures, materials **OR** symbols.	• I can multiply integers using pictures, materials **OR** symbols.	• I can **multiply** integers using pictures, materials **AND** symbols.	• I can **apply multiplication of integers to complex problems.**

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