

**Helena Public Schools  
Middle School  
Grade 8  
Teacher Resource**

Critical Competencies	Specific Examples
Appropriate work shown on all mathematical concepts	
Order of operations including parentheses and brackets	$a(b + c) + [d(e - f) + h]$ when a,b,c,d,e,f, and h are rational numbers
Compute with rational numbers	$a + b, a - b, ab, \frac{a}{b}$ in any combinations when a and b are rational numbers
Solve 2-step equations	Solve the equations $ax + b = c, \frac{x}{a} + b = c$ when a, b, and c are whole numbers.
Graph simple linear equations $y=mx+b$	Develop a graph using a table of values. Graph and evaluate the slope and y-intercept of $y = mx + b$ where m and b are whole numbers
Use formulas for area, perimeter, and circumference of 3- and 4-sided geometric figures and circles; volume (pyramids, prisms, cylinders, and cones)	Find the area of a square, rectangle triangle, trapezoid and/or parallelogram whose base and height are a and b. Find the perimeter of the above figures with sides a, b, c. Find the circumference and/or area of a circle with radius r. (a, b, c, are rational numbers; r is a whole number.
Probability and statistics—odds, combinations, permutations, mean, median, mode, range, stem-and-leaf	Find the odds of rolling a prime number on a standard die. Find the probability of rolling a prime number on a standard die. Given 20 items, how many groups of 5 items are possible? Give 20 items, how many ways can you put 5 items in a specific order? Find the mean, median, mode, and range and draw a stem and leaf plot of 3a, 2b, and 4c (or of a, b, c, a, b, a, c, c, c) if a, b, and c are rational numbers.
Basic applications of proportions and percents	Solve the proportion $\frac{a}{b} = \frac{x}{c}$ where a, b, and c are whole numbers. What is x% of y? X is what percent of y? X is y% of what? (x and y are whole numbers)
Properties—commutative, associative, identity, distributive	Identify and apply the appropriate property. $a+b=b+a, ab=ba, (a+b)+c=a+(b+c), (ab)c=a(bc), a+0=a, 1a =a, a(b+c)=ab+ac$
Appropriate mathematical vocabulary	See CRT vocabulary lists
Display and organize data using graphs	Given a set of data (integers), determine the appropriate display, intervals, and scale and graph the data using a scatter plot, bar graph, pictogram, circle graph, histogram, or stem-and-leaf plot.

