St. Raphael the Archangel
Challenge Math
7th Grade 2017-2018

Learning Goals- Students will:

Expressions, Equations, and Inequalities

1. Evaluate and simplify expressions by combining like terms.
2. Evaluate and simplify expressions using the distributive property.
3. Evaluate expressions when given a value for each variable.
4. Graph one-and-two step inequalities.
5. Read and write expressions.
6. Read and write inequalities.
7. Read and write one- and two-step equations.
8. Solve one-and-two step inequalities.
9. Solve one-step equations.
10. Solve two-step equations.

11. Apply the properties of real numbers to an expression in order to create an equivalent expression.
12. Calculate square and cube roots.
13. Understand that every number has a decimal expansion.
14. Use the properties of integer exponents to simplify expressions.
15. Add, subtract, multiply, and divide numbers using scientific notation.
16. Demonstrate an understanding of slope.
17. Analyze and compare linear relationships.
18. Create/describe relations that are functions and non-functions.
19. Understand and solve Simple Interest problems.

Geometry

1. Calculate missing side lengths using the Pythagorean Theorem.
2. Calculate the area of a circle.
3. Calculate the area of irregular figures.
4. Calculate the area of quadrilaterals.
5. Calculate the area of triangles.
6. Calculate the circumference of a circle.
7. Calculate the perimeter of regular and irregular polygons.
8. Calculate the surface area of a three-dimensional figure.
9. Calculate the volume of three-dimensional figures.
10. Identify and name angles and recognize adjacent, vertical, congruent,

supplementary, and complementary angles.
11. Identify and name intersecting, parallel, and skew lines.
12. Identify and name lines, points, and planes.
13. Identify parts of a circle.
14. Identify, construct, and describe geometric shapes from details given.
15. Use knowledge of angle relationships to write and solve equations that will provide a missing angle measurement.
16. Calculate the volume of rectangular and triangular prisms.
17. Graph ordered pairs on a coordinate plane.
18. Understand how to determine whether two figures are similar.
19. Describe the effects of dilations, translations, rotations, and reflections of two-dimensional figures.

Ratios and Proportional Relationships
1. Calculate discounts and mark-ups.
2. Calculate percent increase and decrease.
3. Define, identify, write, and demonstrate an understanding of rates and ratios.
4. Identify missing side lengths of similar figures.
5. Identify scale factor.
6. Recognize, represent and solve proportional relationships between quantities.
7. Solve percent using proportions and equations.
8. Use ratio and rate reasoning to solve real-world and mathematical problems (unit rate/unit price).

Statistics and Probability

1. Analyze scatter plots and sketch lines of best fit.
2. Calculate and analyze measures of central tendency.
3. Calculate probabilities of compound events.
4. Create and interpret box and whisker plots.
5. Create and interpret circle graphs.
6. Define probability and determine simple probability for single events.
7. Explain and analyze empirical and theoretical probability and conduct experiments to compare the two.
8. Understand that the probability of a chance event can be described using a number between 0 and 1.
9. Use random sampling to draw inferences about a population.
10. Summarize information provided by a set of numerical data.
11. Identify the different types of samples based on a population.

The Number System/Rational Numbers

1. Add and subtract rational numbers (positive and negative numbers, fractions, decimals, square roots, and absolute value).
2. Convert numbers between fractions, decimals, and percent.
3. Multiply and divide rational numbers (positive and negative numbers, fractions, decimals, square roots, and absolute value).
4. Solve problems using order of operations.

5. Add and subtract positive decimals.
6. Compare rational numbers.
7. Identify the greatest common factor.
8. Multiply and divide positive fractions and mixed numbers.
9. Order rational numbers.
10. Explain and use exponents to show powers of 10.
11. Differentiate and identify rational and irrational numbers.