**Math 30-2 Specific Outcomes**

**Strand:** Logical Reasoning

**General Outcome:** Develop special sense and proportional reasoning.

1. **Puzzles and Games** – Analyze puzzles and games that involve numerical and logical reasoning, using problem solving strategies.
* I can explain a strategy to solve a puzzle or win a game.
* I can verify that a strategy works to solve a puzzle or win a game.
* I can identify and correct errors in a solution to a puzzle.
* I can create a variation of a puzzle or game.
1. **Set Theory –** Solve problems that involve the application of set theory.
* I can organize information in sets
* I can use the words “and, or, not” correctly in a set.
* I can use set notation.
* I can explain set theory
* I can solve problems using set theory involving two sets.
* I can solve problems using set theory involving three sets.

**Strand:** Probability

**General Outcome:** Develop critical thinking skills related to uncertainty.

1. **Odds and Probability** – Interpret and assess the validity of odds and probability statements.
* I can express odds for as a probability.
* I can express odds against as a probability.
* I can determine theoretical probability.
* I can determine experimental probability.
* I can solve problems that involve odds and probability.
1. **Probability of Events –** Solve problems that involve the probability of mutually exclusive and non-mutually exclusive events.
* I can determine the probability of mutually exclusive events.
* I can determine the probability of non-mutually exclusive events
* I can distinguish between mutually exclusive and non-mutually exclusive events.
* I can use graphic organizers to represent mutually and non-mutually exclusive events.
* I can solve problems that involve the probability of events.
1. **Probability of Two Events –** Solve problems that involve the probability of two events.
* I can determine the probability of independent events.
* I can determine the probability of dependant events.
* I can determine the probability of a complementary event.
* I can solve problems that involve the probability of two events.
1. **Fundamental Counting Principle –** Solve problems that involve the fundamental counting principle.
* I can explain why the fundamental counting principle works.
* I can solve problems using the fundamental counting principle.
1. **Permutations –** Solve problems that involve permutations.
* I can I can write factorial notation.
* I can use factorial notation to solve problems.
* I can solve problems using permutations.
1. **Combinations –** Solve problems that involve combinations.
* I can determine where to use a permutation versus a combination.
* I can solve problems using combinations.

**Strand:** Relations and Functions

**General Outcome:** Develop algebraic and graphical reasoning through the study of relations .

1. **Rational Expressions** – Determine equivalent forms of rational expressions (limited to numerators and denominators that are monomials and binomials)
* I can explain why a given value is non-permissible for a rational expression.
* I can determine the non-permissible values for the rational expression.
* I can write equivalent forms of rational expressions.
* I can simplify a rational expression.
1. **Operations on Rational Expressions –** Perform operations on rational expressions (limited to numerators and denominators that are monomials and binomials)
* I can determine non-permissible values of rational expressions.
* I can determine the sum or difference of rational expressions.
* I can determine the product or quotient of rational expressions.
* I can simplify a rational expression.
1. **Rational Equations –** Solve problems that involve rational equations (limited to numerators and denominators that are monomials and binomials)
* I can determine the non-permissible values of a rational equation.
* I can determine the solution to a rational equation algebraically.
* I can explain why some solutions of a rational equation may actually be extraneous.
* I can solve problems using rational equations
1. **Logarithms** – Demonstrate an understanding of logarithms and the laws of logarithms.
* I can write a logarithmic expression as an exponential expression.
* I can write an exponential expression as a logarithmic expression.
* I can determine the exact value of a logarithm that is exact.
* I can estimate the value of a logarithm that is not exact.
* I can use the product law of logarithms to simplify expressions.
* I can use the quotient law of logarithms to simplify expressions.
* I can use the power laws of logarithms to simplify expressions.
* I can solve problems suing the laws of logarithms.
1. **Exponential Equations** – Solve problems that involve exponential equations.
* I can determine the solution to exponential equations.
* I can verify a solution to a logarithmic equation.
* I can solve problems that involve exponential growth or decay.
* I can use exponential equations to solve problems.
1. **Exponential and Logarithmic Functions** – Represent data, using exponential and logarithmic functions, to solve problems.
* I can sketch the graph of an exponential function.
* I can determine the domain and range of an exponential function.
* I can determine horizontal asymptotes of an exponential function.
* I can determine the intercepts of an exponential function.
* I can sketch the graph of a logarithmic function.
* I can determine the domain and range of a logarithmic function.
* I can determine the vertical asymptote of a logarithmic function.
* I can determine the intercepts of a logarithmic function.
* I can solve problems involving exponential and logarithmic functions.
1. **Polynomial Functions** – Represent data, using polynomial functions (of degree $\leq 3$), to solve problems.
* I can determine the degree of a polynomial equation.
* I can determine the degree from the graph of a polynomial.
* I can classify polynomial equations as constant, linear, quadratic, or cubic.
* I can classify polynomial graphs as constant, linear, quadratic, or cubic.
* I can determine the equation given a set of data.
* I can solve problems involving polynomials.
1. **Sinusoidal Functions** – Represent data, using sinusoidal functions, to solve problems.
* I can sketch the graph of $y=a\sin(\left(bx-c\right)+d)$
* I can determine the amplitude of a trigonometric graph.
* I can determine the period of a trigonometric graph.
* I can determine the horizontal (phase) shift.
* I can determine the vertical displacement.
* I can determine the maximums and minimums of a trigonometric function.
* I can determine the domain and range of a trigonometric graph.
* I can determine the zeros of a trigonometric graph.
* I can write a trigonometric equation given a graph.
* I can use a trigonometric equation to solve a problem.

**Strand:** Math Research Project

**General Outcome:** Develop an appreciation of the role of mathematics in society.

1. **Research Project –** Research and give a presentation on a current event of an area of interest that involves mathematics.
* I can show connection of mathematics to society.