Livingstone Range
SCHOOL DIVISION No. 68

Math 8

General & Specific Outcomes, I Can Statements, and Vocabulary

Strand: Number

General Outcome: Develop number sense.

Specific Outcomes:

1. **Perfect Squares –** Demonstrate an understanding of perfect squares and square roots, concretely, pictorially, and symbolically (limited to whole numbers).
   - ✔ I can show that a number is a perfect square concretely, pictorially, and symbolically.
   - ✔ I can determine if a number is a perfect square.
   - ✔ I can identify the square root of a perfect square.

2. **Square Roots –** Determine the approximate square root of numbers that are not perfect squares (limited to whole numbers).
   - ✔ I can estimate the square root of a whole number.
   - ✔ I can use technology to determine the square root of a whole number.

3. **Percents –** Demonstrate an understanding of percents greater than or equal to 0%, including greater than 100%.
   - ✔ I can provide a context where a percent may be more than 100% or between 0% and 1%.
   - ✔ I can express a given number as a fraction, decimal, and percent.
   - ✔ I can calculate a percentage.
   - ✔ I can calculate percent of a number.
   - ✔ I can use percent calculations appropriately in problem situations (such as determining sales tax, discount, tips, total cost, percent increase and decrease, and combined percents, etc.)

4. **Ratio & Rate –** Demonstrate an understanding of ratio and rate.
   - ✔ I can express two and three term ratios from a given context using words and or symbols. (Ex. 3:5 or 3 to 5, 20L per 100km or 20L/100km)

- ✔ I can express a part to part ratio as a part to whole fraction.
- ✔ I can calculate unit rates.
- ✔ I can identify rates and ratios from real-life examples.
- ✔ I can express a given ratio as a percent, and explain why a rate cannot be represented as a percent.

5. **Proportional Reasoning –** Solve problems that involve rates, ratios, and proportional reasoning.
   - ✔ I can give an example of when $\frac{a}{b}$ represents a: fraction, rate, ratio, quotient, probability.
   - ✔ I can determine the missing number in a proportion.
   - ✔ I can solve a given problem involving rate, ratio, or percent.

6. **Multiplying & Dividing Fractions –** Demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially, and symbolically.
   - ✔ I can model multiplication of positive fractions concretely and record the process.
   - ✔ I can model division of positive fractions concretely and record the process.
   - ✔ I can estimate the product of two positive proper fractions.
   - ✔ I can estimate the quotient of two positive proper fractions.
   - ✔ I can identify in a problem situation when to multiply and when to divide fractions.
   - ✔ I can multiply fractions.
   - ✔ I can divide fractions.
   - ✔ I can express mixed numbers as improper fractions and vice versa.
   - ✔ I can multiply and divide mixed numbers.
   - ✔ I can develop and apply personal strategies for multiplying and dividing fractions and mixed numbers.

7. **Multiplying & Dividing Integers –** Demonstrate an understanding of multiplication and division of integers, concretely, pictorially, and symbolically.
    - ✔ I can model multiplication and division of integers concretely and record the process.
    - ✔ I can multiply and divide integers.
    - ✔ I can identify in a problem situation when to multiply and when to divide integers.
    - ✔ I can develop and apply personal strategies for multiplying and dividing integers.
    - ✔ I can use order of operations appropriately.

Vocabulary

Perfect Square
Square Root
Factor
Square
Squared
Benchmark
Approximate
Estimate
Rational
Irrational
Percent Of
Percent Off
Ratio
Rate
Unit Rate
Part to Part
Part to Whole
Proportion

(Students should be familiar with the following words from grade 7.)

Divisble	Area	Improper Fraction
Factor	Expression	Proper Fraction
Multiple	Equivalent	Mixed Number
Prime Number	Percent	Lowest Terms
Composite Number	Greater Than	Reduce
Natural Numbers	Less Than	Simplify
Whole Numbers	Equal To	Common Denominator
Product	Bar Notation	Integer
Quotient	Terminating Decimal	Positive
Remainder	Repeating Decimal	Negative
Even	Round	Zero Principle
Odd	Approximation	Zero Pairs
Dividend	Concretely	Opposite Integers
Divisor	Pictorially	Number Line
Undefined	Symbolically	Ascending
Sum	Equivalent Fraction	Descending
Difference	Denominator	
Place Value	Numerator	

Strand: Patterns & Relations

General Outcome: Use patterns to describe the world and to solve problems.

Specific Outcomes:

1. **Graphing Linear Relations –** Graph and analyze two-variable linear relations.
   - ✔ I can substitute into an equation to create a table of values or set of ordered pairs.
   - ✔ I can write ordered pairs from a given equation.
   - ✔ I can graph a table of values or set of ordered pairs.
   - ✔ I can use a graph to solve problems.
   - ✔ I can explain how constant terms, numerical coefficients, and variables are related to a graph and an equation.

General Outcome: Represent algebraic expressions in multiple ways.

Specific Outcomes:

2. **Solving Linear Equations –** Model and solve problems, concretely, pictorially, and symbolically, using linear equations of the form:

- $ax = b$
- $\frac{x}{a} = b, a \neq 0$
- $ax + b = c$
- $\frac{x}{a} + b = c, a \neq 0$
- $a(x + b) = c$

where a, b, and c are integers.

- ✔ I can represent a given problem with an algebraic equation and solve concretely, pictorially, and symbolically.
- ✔ I can apply the distributive property to solve equations.
- ✔ I can verify the solution to an algebraic equation.

Vocabulary

Distributive Property

(Students should be familiar with the following words from grade 7.)

Constant	Equation	Substitute
Variable	T-Chart	Equality
Algebraic Expression	Pattern	Preservation of Equality
Numerical Coefficient	Stage Number	

Strand: Shape & Space

General Outcome: Use direct and indirect measurement to solve problems.

Specific Outcomes:

1. **Pythagorean Theorem** – Develop and apply the Pythagorean Theorem to solve problems.
   - ✔ I can model and explain Pythagorean Theorem concretely or pictorially.
   - ✔ I can explain why the Pythagorean Theorem can only be used for right triangles.
   - ✔ I can determine the measure of the third side of a right triangle, given the measures of the two other sides.
   - ✔ I can determine if a triangle is a right triangle using Pythagorean Theorem.
   - ✔ I can solve problems involving right triangles using Pythagorean Theorem.

2. **Nets & 3D Objects –** Draw and construct nets for 3D objects.
    - ✔ I can match a given net to the 3D object it represents.
    - ✔ I can construct a 3D object from a given net.
    - ✔ I can draw nets for cylinders and prisms.

3. **Surface Area –** Determine the surface area of right rectangular prisms, right triangular prisms, and right cylinders to solve problems.
    - ✔ I can identify the faces of prisms and cylinders.
    - ✔ I can develop a strategy for determining the surface area of a 3D object.
    - ✔ I can calculate the surface area of prisms and cylinders.
    - ✔ I can solve problems involving surface area.

4. **Volume –** Develop and apply formulas for determining the volume of right rectangular prisms, right triangular prisms, and right cylinders.
    - ✔ I can explain the difference between surface area and volume.
    - ✔ I can explain that the base and the height of a prism or cylinder are perpendicular.
    - ✔ I can explain the connection between the area of the base and the volume of a prism or cylinder.
    - ✔ I can develop a formula for determining the volume of a prism or cylinder.
    - ✔ I can apply a formula for determining the volume of a prism or cylinder.
    - ✔ I can solve problems involving volume.

General Outcome: Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.

Specific Outcomes:

5. **Dimensional Views –** Draw and interpret top, front, and side views of 3D objects composed of right rectangular prisms.
    - ✔ I can draw and label the top, front, and side views of a given 3D object.
    - ✔ I can build a 3D object from a given top, front, and side view.

General Outcome: Describe and analyze position and motion of objects and shapes.

Specific Outcomes:

6. **Congruence of Polygons –** Demonstrate an understanding of the congruence of polygons

Vocabulary

Pythagorean Theorem	3 Dimensional Object	Surface Area
Hypotenuse	Prism	Volume
Legs	Cylinder	Capacity
Right Triangle	Faces	Vertex
Right Angle	Base	Polygon
Net	Height	Congruent

(Students should be familiar with the following words from grade 7.)

Radius	Parallel	Transformation
Diameter	Perpendicular	Translation
Circumference	Bisector	Reflection
Pi	Line	Rotation
Central Angle	Line Segment	Image
Compass	Cartesian Plane	Horizontal
Protractor	Axes	Vertical
Degree	Ordered Pair	Consecutive
Parallelogram	Coordinates	Clockwise
Formula	Quadrant	Counter-Clockwise
Area	Vertices	

Strand: Statistics & Probability

General Outcome: Collect, display and analyze data to solve problems.

Specific Outcomes:

1. **Critiquing Graphs –** Critique ways in which data is presented in circle graphs, line graphs, bar graphs, and pictographs.

   ✔ I can determine the most appropriate graph for a set of data.

   ✔ I can explain why one graph is better than another for a set of data.

   ✔ I can identify ways a graph can be misleading.

General Outcome: Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.

Specific Outcomes:

2. **Probability of Independent Events –** Solve problems involving the probability of independent events.
    - ✔ I can define and provide examples of independent and dependent events.
    - ✔ I can display the sample space for independent events.
    - ✔ I can generalize and apply a rule to calculate the probability of independent events.

Vocabulary

Interval	Misinterpret	Misrepresent

(Students should be familiar with the following words from grade 7.)

Central Tendency	Degrees	Likelihood
Mean	Circle Graph	Event
Median	Angle	Sample Space
Mode	Circle	Independent Events
Range	Portion	Dependent Events
Data	Legend	Theoretical Probability
Outlier	Probability	Experimental Probability
Compass	Ratio	Experiment
Protractor	Manipulate	
Proportion	Chance	