ISAT ~ Exam Framework and Benchmarks ~ Grades 6-8

Involving multiplicative reasoning with rates

(Excerpted from the full ISAT Framework.)

ISAT (Illinois Standards Achievement Test) Framework

State Goal 6: Number Sense

Standards 6B, 6C – Computation, Operations, Estimation, and Properties

6th Grade	7th Grade	8th Grade
6.6.12 Solve problems and number sentences involving addition, subtraction, multiplication, and division using whole numbers.	**6.7.08** Solve problems and number sentences involving addition, subtraction, multiplication, and division using integers, fractions, and decimals.	**6.8.09** Solve problems and number sentences involving addition, subtraction, multiplication, and division using rational numbers, exponents, and roots.
6.6.13 Solve problems and number sentences involving addition, subtraction, and multiplication of decimals		

Standard 6D – Ratios, Proportions, and Percents

6.6.18 Identify and express ratios using appropriate notation (i.e., a/b, a to b, a:b), identify equivalent ratios, and explain ratios that represent a given situation.	**6.7.14** Create and explain ratios that represent a given situation.	**6.8.15** Use ratios to describe problem situations.
6.6.19 Solve problems involving proportional relationships, including unit pricing (e.g., seven apples cost $1.40, so nine apples cost $1.80).	**6.7.15** Use proportional reasoning to model and solve problems.	**6.8.16** Use proportional reasoning to model and solve problems.
6.6.21 Solve number sentences and problems involving percents.	**6.7.17** Solve number sentences and problems involving fractions, decimals, and percents (e.g., 50% of 10 is the same as 1/2 of 10 is the same as 0.5×10, sales tax, tips, interest, discounts).	**6.8.18** Solve number sentences and problems involving fractions, decimals, and percents (e.g., percent increase and decrease, interest rates, tax, discounts, tips).

State Goal 7: Measurement

Standards 7A, 7B, 7C – Units, Tools, Estimation, and Applications

7.6.02 Solve problems involving the perimeter and area of a triangle, parallelogram, or irregular shape using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description).	**7.7.02** Solve problems involving the perimeter and area of polygons and composite figures using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description).	**7.8.02** Solve problems involving perimeter/circumference and area of polygons, circles, and composite figures using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description).
7.6.04 Determine the volume of a right rectangular prism using an appropriate formula or strategy.	**7.7.04** Determine the volume and surface area of a right rectangular prism using an appropriate formula or strategy.	**7.8.04** Solve problems involving the volume or surface area of a right rectangular prism, right circular cylinder, or composite shape using an appropriate formula or strategy.
7.6.05 Solve problems involving unit conversions within the same measurement system for time, length, and weight/mass, including compound units (e.g., 5ft 5in, 2lbs 2oz).	**7.7.05** Solve problems involving unit conversions within the same measurement system for length, weight/mass, capacity, and square units (e.g., 1 ft^2 = 144 in^2).	**7.8.05** Solve problems involving unit conversions within the same measurement system for length, weight/mass, capacity, square units, and measures expressed as rates (e.g., converting feet/second to yards/minute).
7.6.06 Solve problems involving scale drawings and maps.	**7.7.06** Solve problems involving scale drawings and maps.	**7.8.06** Solve problems involving scale drawings, maps, and indirect measurement (e.g., determining the height of a building by comparing its known shadow length to the known height and shadow length of another object).

State Goal 8: Algebra

Standard 8B – Connections Using Tables, Graphs, and Symbols

		8.8.06 Recognize, describe, and extend patterns using rate of change.
8.6.06 Translate between different representations (table, written, or pictorial) of whole number relationships.	**8.7.08** Translate between different representations (table, written, graphical, or pictorial) of whole number relationships and linear expressions.	**8.8.08** Translate between different representations (table, written, graphical, or pictorial) of whole number relationships and linear expressions.
		8.8.09 Interpret the meaning of slope and intercepts in linear situations.

Standards 8C, 8D – Writing, Interpreting, and Solving Equations

8.6.10 Solve word problems involving unknown quantities.	**8.7.12** Solve word problems involving unknown quantities.	**8.8.13** Solve word problems involving unknown quantities.

ILS (Illinois Learning Standards) Benchmarks

STATE GOAL 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.

A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.

B. Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.

C. Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers.

D. Solve problems using comparison of quantities, ratios, proportions and percents.

MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL
6.B.3a Solve practical computation problems involving whole numbers, integers and rational numbers.	
6.C.3a Select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions.	**6.C.4** Determine whether exact values or approximations are appropriate (e.g., bid a job, determine gas mileage for a trip).
6.D.3 Apply ratios and proportions to solve practical problems.	**6.D.4** Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios, proportions and percents.

STATE GOAL 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

A. Measure and compare quantities using appropriate units, instruments and methods.

B. Estimate measurements and determine acceptable levels of accuracy.

C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.

MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL
7.A.3b Apply the concepts and attributes of length, capacity, weight/mass, perimeter, area, volume, time, temperature and angle measures in practical situations.	**7.A.4b** Apply formulas in a wide variety of theoretical and practical real-world measurement applications involving perimeter, area, volume, angle, time, temperature, mass, speed, distance, density and monetary values.
7.C.3b Use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions.	**7.C.4b** Interpret scale drawings and models using maps and blueprints.
	7.C.4c Convert within and between measurement systems and monetary systems using technology where appropriate.

STATE GOAL 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

A. Describe numerical relationships using variables and patterns.

B. Interpret and describe numerical relationships using tables, graphs and symbols.

C. Solve problems using systems of numbers and their properties.

D. Use algebraic concepts and procedures to represent and solve problems.

MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL
8.D.3a Solve problems using numeric, graphic or symbolic representations of variables, expressions, equations and inequalities.	
8.D.3b Propose and solve problems using proportions, formulas and linear functions.	