Blind Brook School District
Grade 6
Math Standards Curriculum Alignment
August 2006

Pre-March Exam Scope and Sequence

Unit 1: Number Sense

Unit Outline:

Whole Numbers and Exponents
- Numeration through trillion
- Properties
- Operations and estimation
- Exponents
- Order of operations (PEDMAS)
- Scientific notation

Rational Numbers
- Absolute value
- Number line
- Order

Content Strands

6.N.1	Read and write whole numbers to trillions
6.N.2	Define and identify the commutative and associative properties of addition and multiplication
6.N.3	Define and identify the distributive property of multiplication over addition
6.N.4	Define and identify the identity and inverse properties of addition and multiplication
6.N.5	Define and identify the zero property of multiplication
6.N.6	Evaluate numerical expressions using order of operations [may include
6.N.22	exponents of two and three]
6.N.23	Represent repeated multiplication in exponential form
6.N.24	Represent exponential form as repeated multiplication
6.N.25	Evaluate expressions having exponents where the power is an exponent of one, two, or three
6.N.27	Justify the reasonableness of answers using estimation [including rounding]
6.N.13	Define absolute value and determine the absolute value of rational numbers [including positive and negative numbers]
6.N.14	Locate rational numbers on a number line [including positive and negative]
6.N.15	Order rational numbers [including positive and negative]

Process Strands

6.PS.1	Know the difference between relevant and irrelevant information when solving problems
6.PS.2	Understand that some ways of representing a problem are more efficient than others
6.PS.3	Interpret information correctly, identify the problem, and generate possible strategies and solutions
6.PS.4	Act out or model with manipulatives activities involving mathematical content from literature
6.PS.5	Formulate problems and solutions from everyday situations
6.PS.10	Work in collaboration with others to solve problems
6.PS.12	Use trial and error and the process of elimination to solve problems
6.PS.16	Discuss with peers to understand a problem situation
6.PS.17	Determine what information is needed to solve a problem
6.PS.23	Verify results of a problem
6.RP.3	Investigate conjectures, using arguments and appropriate mathematical terms
6.RP.7	Verify claims other students make, using examples and counterexamples when appropriate
6.RP.9	Devise ways to verify results
6.CM.1	Provide an organized thought process that is correct, complete, coherent, and clear
6.CM.3	Organize and accurately label work
6.CM.4	Share organized mathematical ideas through the manipulation of objects, numerical tables, drawings, pictures, charts, graphs, tables, diagrams, models, and symbols in written and verbal form
6.CM.6	Understand mathematical solutions shared by other students
6.CM.9	Increase their use of mathematical vocabulary and language when communicating with others
6.CN.1	Understand and make connections and conjectures in their everyday experiences to mathematical ideas
6.R.2	Explain, describe, and defend mathematical ideas using representations
6.R.9	Use mathematics to show and understand mathematical phenomena [i.e., find the missing value: $(3 + 4) + 5 = 3 + (4 + \_)$]

Vocabulary

addends	associative property of addition
additive inverse	associative property of multiplication
base ten number system	commutative property of addition
counting (natural) numbers	commutative property of multiplication
difference	distributive property
divisor	dividend
estimation	exponent
exponential form	factor
identity property of addition	identity property of multiplication
negative	number system
number line	operation
order (noun)	order (verb)
order of operations	PEMDAS
positive power	product
quotient	rational number round
standard form	sum
whole number	zero property of multiplication
absolute value	integer

Unit 2: Fractions

Unit Outline

- Meaning and estimation
- Comparison, equivalence, and simplification
- Operations on like and unlike fractions
- Conversions: fractions ↔ decimals

Content Strands

6.N.16	Add, subtract fractions with unlike denominators
6.N.17	Multiply and divide fractions with unlike denominators
6.N.18	Add, subtract, multiply and divide mixed numbers with unlike denominators
6.N.19	Identify the multiplicative inverse (reciprocal) of a number
6.N.20	Represent fractions as terminating or repeating decimals
6.N.21	Find multiple representations of rational numbers [fractions, decimals, and percents 0 to 100]
6.N.26	Estimate a percent of quantity [0% to 100%]

Process Strands

6.PS.13	Model problems with pictures/diagrams or physical objects
6.PS.14	Analyze problems by observing patterns
6.PS.15	Make organized lists or charts to solve numerical problems
6.PS.18	Determine the efficiency of different representations of a problem
6.PS.22	Discuss whether a solution is reasonable in the context of the original problem
6.RP.2	Understand that mathematical statements can be supported, using models, facts and relationships to explain their thinking
6.CM.5	Answer clarifying questions from others

Vocabulary

composite number	convert
denominator	divisibility rules
equivalent	fractions
factor	fraction
greatest common factor	improper fractions
inverse operation	like (common) denominators
lowest terms	lowest Common Denominator
mixed number	multiplicative inverse (reciprocal)
numerator	proper fractions
prime number	repeating decimal
simplify	terminating decimal
unlike denominators	

Unit 3: Ratio and Proportions

Unit Outline

Ratio and Proportion
- Definitions: ratio, rate, unit ratio
- Expressions involving ratios, rates, unit ratios
- Proportions

Percents
- Definition
- Conversions: fraction ↔ decimal ↔ percent
- Problems involving percents
- Estimation

Content Strands

6.N.6	Understand the concept of rate
6.N.7	Express equivalent ratios as a proportion
6.N.8	Distinguish the difference between rate and ratio
6.N.9	Solve proportions using equivalent fractions
6.N.10	Verify the proportionality using the product of the means equals the product of the extremes
6.N.11	Read, write, and identify percents of a whole [0% to 100%]
6.N.12	Solve percent problems involving percent, rate, and base

Process Strands

6.PS.19	Differentiate between valid and invalid approaches
6.PS.20	Understand valid counterexamples
6.PS.21	Explain the methods and reasoning behind the problem solving strategies used
6.RP.1	Recognize that mathematical ideas can be supported using a variety of strategies
6.RP.4	Make and evaluate conjectures using a variety of strategies
6.RP.8	Support an argument through examples/counterexamples and special cases
6.CM.2	Explain a rationale for strategy solution
6.CN.2	Explore and explain the relationship between mathematical ideas

Vocabulary

equivalent ratios	extremes (of a proportion)
interest	means (of a proportion)
rate	ratio
percent	proportion sales discount sales price sales tax tip
unit rate	

Unit 4: Statistics and Probability

Unit Outline

- Measures of central tendency
- Range
- Interpretation of graphs
- Predictions

Content Strands

6.S.5	Determine the mean, mode and median for a given set of data
6.S.6	Determine the range for a given set of data
6.S.7	Read and interpret graphs
6.S.8	Justify predictions made from data

Process Strands

6.CN.3	Connect and apply mathematical information to solve problems
6.CN.8	Investigate the presence of mathematics in careers and areas of interest
6.CN.9	Recognize and apply mathematics to other disciplines and areas of interest
6.R.1	Use physical objects, drawings, charts, tables, graphs, symbols, equations and objects created using technology as representations
6.R.3	Read, interpret, and extend external models
6.R.8	Use mathematics to show and understand social phenomena [i.e., construct tables to organize data showing book sales]

Vocabulary

bar graph	circle graph
histogram (histograph)	data
frequency	frequency table
line graph	line plot
mean	measures of central tendency
median	Mode
pictograph	population
range	sampling
statistics	

Unit 5: Measurement

Unit Outline

- Capacity/volume
- Units: metric and customary
- Conversion within a system
- Estimation

Content Strands

6.M.1	Measure capacity and calculate volume of a rectangular prism
6.M.2	Identify customary units of capacity [cups, pints, quarts, and gallons]
6.M.3	Identify equivalent customary units of capacity [cups to pints, pints to quarts, and quarts to gallons]
6.M.4	Identify metric units of capacity [liter and milliliter]
6.M.5	Identify equivalent metric units of capacity [milliliter to liter and liter to milliliter]
6.M.6	Determine the tool and technique to measure with an appropriate level of precision: capacity
6.M.7	Estimate volume, area, and circumference [see figures identified in geometry strand]
6.M.8	Justify the reasonableness of estimates
6.M.9	Determine personal references for capacity

Process Strands

6.CN.5	Model situations with objects and representations and be able to draw conclusions
6.CN.6	Recognize and provide examples of the presence of mathematics in their daily lives
6.CN.7	Apply mathematics to problem situations that develop outside of mathematics
6.R.4	Use standard and nonstandard representations with accuracy and detail

Vocabulary

capacity	conversion
cup	customary units
gallon	equivalent customary units of capacity
liter	metric system
metric units of capacity	milliliter
pint	quart
volume	

Unit 6: Geometry

Unit Outline

Polygons and Prisms
- Similar triangles
- Area of triangles and quadrilaterals
- Area of polygons
- Volume of rectangular prisms

Circles
- Definitions
- Circumference and area
- Sectors
- Estimation

Content Strands

6.G.1	Calculate the length of corresponding sides of similar triangles using proportional reasoning
6.G.2	Determine the area of triangles and quadrilaterals [squares, rectangles, rhombi, and trapezoids] and develop formulas
6.G.3	Use a variety of strategies to find the area of regular and irregular polygons
6.G.4	Determine the volume of rectangular prisms by counting cubes and develop the formula
6.G.5	Identify radius, diameter, chords and central angles of a circle
6.G.6	Understand the relationship between the diameter and radius of a circle
6.G.7	Determine the area and circumference of a circle, using the appropriate formula
6.G.8	Calculate the area of a sector of a circle, given the measure of a central angle and the radius of the circle
6.G.9	Understand the relationship between the circumference and the diameter of a circle

Process Strands

6.PS.6	Translate from a picture/diagram to a numeric expression
6.CM.8	Consider strategies used and solutions found by others in relation to their own work
6.CM.10	Use appropriate vocabulary when describing objects, relationships, mathematical solutions, and rationale
6.CM.11	Decode and comprehend mathematical visuals and symbols to construct meaning
6.CN.4	Understand multiple representations and how they are related
6.R.7	Use mathematics to show and understand physical phenomena [i.e., determine the perimeter of a bulletin board]

Vocabulary

angle	area
arc	central angle
chord	circle
circumference	congruent
corresponding sides	degrees
diameter	height
intersects	irregular polygon
length	parallel
perimeter	pi (π)
polygon	point
prism	quadrant
quadrilateral radius	rectangle
rectangular prism	regular polygon
right angle	rhombus
sector	similar triangles
square	trapezoid
triangle	vertex
volume	width

Unit 7: Algebra

Unit Outline

- Verbal expression → algebraic expression (2-step)
- Evaluation of formulas

Content Strands

6.A.1	Translate two-step verbal expressions into algebraic expressions
6.A.6	Evaluate formulas for given input values [circumference, area, volume, distance, temperature, interest, etc.]

Process Strands

6.PS.7	Represent problem situations verbally, numerically, algebraically, and/or graphically
6.PS.11	Translate from a picture diagram to a number or symbolic expression

Vocabulary

algebra	algebraic expression
algebraic equation	algebraic solution
coefficient	constant
equation	evaluate
expression	inverse operation
numerical expression	substitute
translate	variable
verbal expression	

Post-March Exam Scope and Sequence

Unit 8: Algebra/ /Statistics and Probability/Geometry

Unit Outline

Algebra (Part 2)
- Evaluation of algebraic expressions
- Verbal expression → algebraic equation
- Equations: 2-step solutions

Statistics (Part 2)
- Samples
- Frequency tables
- Venn diagrams
- Graphs: picto, bar, line, and circle, and histograms

Probability
- Definitions: event, outcome, probability of an event
- Compound events: AND and OR
- Dependent and independent events
- Counting principle

Coordinate Geometry
- Definitions: coordinate, origin, quadrant
- Ordered pair ↔ point on the coordinate plane
- Area of a polygon

Content Strands

6.A.2	Use substitution to evaluate algebraic expressions [may include exponents of one, two, or three]
6.A.3	Translate two-step verbal sentences into algebraic equations
6.A.4	Solve and explain two-step equations involving whole numbers using inverse operations
6.A.5	Solve simple proportions within context
6.G.10	Identify and plot points in all four quadrants
6.G.11	Calculate the area of basic polygons drawn on a coordinate plane [rectangles and shapes composed of rectangles having sides with integer lengths]
6.S.1	Develop the concept of sampling when collecting data from a population and decide the best method to collect data for a particular question
6.S.2	Record data in a frequency table
6.S.3	Construct Venn diagrams to sort data
6.S.4	Determine and justify the most appropriate graph to display a given set of data [picto, bar, line, circle graphs, and histograms]
6.S.9	List possible outcomes for compound events
6.S.10	Determine the probability of dependent events

6.S.11	Determine the number of possible outcomes for a compound event by using the fundamental counting principle and use this to determine the probabilities of events when the outcomes have equal probabilities

Process Strands

6.PS.8	Select an appropriate representation of a problem Understand the basic language of logic in mathematical situations [and, or, not]
6.RP.5	Justify general claims or conjectures using manipulatives, models, expressions, and mathematical relationships
6.RP.6	Develop and explain an argument verbally, numerically, algebraically, and/or graphically
6.CM.7	Raise questions that elicit, extend, or challenge others' thinking
6.R.5	Use representations to explore problem situations
6.R.6	Investigate relationships between different representations and their impact on a given problem

Vocabulary

Review vocabulary from Algebra (1)
Review vocabulary from Statistics (1)

compound events	dependent events
event	favorable outcomes
impossible outcomes	fundamental counting principle
independent events	justify
possible outcomes	predict
probability	sample space
tree diagram	Venn diagrams
coordinate geometry	coordinate plane
ordered pair	origin
plot	point
quadrant	

Additional Vocabulary

Problem Solving

analyze	apply
collaboration	counterexample
differentiate	discuss
draw a graph	draw a picture
explain	formulate
identity	interpret
invalid approach	irrelevant information
logic	language of logic (and, or, not)
logical reasoning	model using manipulatives
monitor	observe patterns
organized chart	organized list
process of elimination	reasonableness of a solution
reflect	relevant information
solution	solve a simpler problem
strategies	trial and error
valid approach	verify results
work backwards	write an equation

Reasoning and Proof

Algebraically	appropriate mathematical terms
Argument	conjecture (noun)
Counterexample	develop formulas
Explain	graphically
Interpret	investigate
Justify	manipulative(s)
mathematical relationships	methods of proof
models	numerically
solve	special case(s)
verbally	verify claims of others

Communication

accurately label work	analyze
calculate	clarifying questions
comprehend	consolidate
decode	distinguish
explain	extend
greater than	less than
mathematical relationships	organize work
rationale	solution
verbal symbols	written symbols

Connections

apply
compare
connections
explore
investigate
mathematical relationships
model problems
coherent
conjecture (verb)
draw conclusions
factor
irrelevant information
model (noun)
relevant information

Representation

apply
explain
extend
investigate
model(s)
physical phenomena
standard representations
describe
explore
interpret
mathematical phenomena
nonstandard representations
social phenomena