

**Pocantico Hills School District
Grade 6 Curriculum Draft**

Number Sense and Operations

(Pre-March)

Content Strands: Performance Indicators

- 6. N.1 Read and write whole numbers to trillions
- 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.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.27 Justify the reasonableness of answers using estimation (including rounding)
- 6. N.22 Evaluate numerical expressions using order of operations (may include exponents of two and three)
- 6. N.13 Define absolute value and determine the absolute value of rational numbers (including positive and negative)
- 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: Performance Indicators

- 6. CN.2 Explore and explain the relationship between mathematical ideas
- 6. CN.1 Understand and make connections and conjectures in their everyday experiences to mathematical ideas
- 6. CM.9 Increase their use of mathematical vocabulary and language when communicating with others
- 6. RP.1 Recognize that mathematical ideas can be supported using a variety of strategies
- 6. RP.2 Understand that mathematical statements can be supported, using models, facts and relationships to explain their thinking
- 6. PS.19 Differentiate between valid and invalid approaches
- 6. PS.21 Explain the methods and reasoning behind the problem solving strategies used
- 6. PS.22 Discuss whether a solution is reasonable in the context of the original problem
- 6. PS.23 Verify results of a problem
- 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: $(3 + 4) + 5 = 3 + (4 + \underline{\quad})$)
- 6. CM.8 Consider strategies used and solutions found by others in relation to their own work
- 6. PS.20 Understand valid counterexamples
- 6. PS.18 Determine the efficiency of different representations of a problem

Vocabulary

counting (natural) number
rational number
estimate
number system

numerical problem
associative property of addition
associative property of multiplication
commutative property of addition

commutative property of multiplication
distributive property
identity property of addition
identity property of multiplication
identity property of multiplication
zero property of multiplication
identity element
inverse element
exponent

exponential form
multiply multiplication)
operation
order
order of operations
power
base number system
properties of real numbers

Fractions

Content Strands: Performance Indicators

- 6. N.9 Solve proportions using equivalent fractions
- 6. N.16 Add, subtract fractions with unlike denominators
- 6. N.17 Multiply and divide fractions with unlike denominators
- 6. N.19 Identify the multiplicative inverse (reciprocal) of a number
- 6. N.18 Add subtract, multiply and divide mixed numbers with unlike denominators
- 6. N.20 Represent fractions as terminating or repeating decimals

Process Strands: Performance Indicators

- 6. PS.5 Formulate problems and solutions from everyday situations
- 6. PS.8 Select an appropriate representation of a problem
- 6. RP.8 Support an argument through examples/counterexamples and special cases
- 6. RP.9 Devise ways to verify results
- 6. CM.2 Explain a rationale for strategy selection
- 6. CM.5 Answer clarifying questions from others
- 6. CN.3 Connect and apply mathematical information to solve problem
- 6. CN.6 Recognize and provide examples of the presence of mathematics in their daily lives
- 6. R.5 Use representations to explore problem situation
- 6. CM.1 Provide an organized thought process that is correct, complete, coherent, and clear

Vocabulary

inverse operation

fraction

lowest terms

unlike denominators

like (common) denominators

equivalent fractions

mixed number

inverse element

multiplicative inverse (reciprocal)

round

whole number

equivalent numerical expression

Ratio/Percents

Content Strands: Performance Indicators

- 6. N.6 Understand the concept of rate
- 6. N.8 Distinguish the difference between rate and ratio
- 6. N.7 Express equivalent ratios as a proportion

- 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.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%)
- 6. N.12 Solve percent problems involving percent, rate, and base

Process Strands: Performance Indicators

- 6. CN.7 Apply mathematics to problem situations that develop outside of mathematics
- 6. CN.8 Investigate the presence of mathematics in careers and areas of interest
- 6. R.6 Investigate relationships between different representations and their impact on a given problem
- 6. CM.6 Understand mathematical solutions shared by other students
- 6. CM.7 Raise questions that elicit, extend, or challenge others’ thinking
- 6. PS.1 Know the difference between relevant and irrelevant information when solving problem
- 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 solution
- 6. RP.4 Make and evaluate conjectures, using a variety of strategies
- 6. CN.9 Recognize and apply mathematics to other disciplines and areas of interest
- 6. PS.12 Use trial and error and the process of elimination to solve problems
- 6. PS.10 Work in collaboration with others to solve problems
- 6. PS.9 Understand the basic language of logic in mathematical situations (*and, or, and not*)

Vocabulary

- | | |
|----------------------------------|-------------------|
| percent | rate |
| repeating decimal | rate of interest |
| round | ratio |
| terminating decimal | absolute value |
| whole number | additive inverse |
| equivalent numerical expressions | integer |
| base (of percent) | inverse operation |
| equivalent ratios | negative |
| proportion | number line |
| means | positive |
| extremes | |

Geometry/Measurement/Statistics

Content Strands: Performance Indicators

Geometry

- 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 developing the formula
- 6. M.1 Measure capacity and calculate volume of a rectangular prism
- 6. M.7 Estimate volume, area, and circumference (see figures identified in geometry strand)
- 6. G.5 Identify radius, diameter, chords and central angles 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. A.6 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.)

Measurement

- 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.9 Determine personal references for capacity
- 6. M.8 Justify the reasonableness of estimates

Statistics

- 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

Algebra Readiness

- 6. A.1 Translate two-step verbal expressions into algebraic expressions

Process Strands: Performance Indicators

- 6. PS.6 Translate from a picture/diagram to a numeric expression
- 6. PS.7 Represent problem situations verbally, numerically, algebraically, and/or graphically
- 6. PS.13 Model problems with pictures/diagrams or physical object
- 6. PS.14 Analyze problems by observing patterns
- 6. RP.5 Justify general claims or conjectures, using manipulatives, models, expressions, and mathematical relationships
- 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.5 Model situations with objects and representations and be able to draw conclusions
- 6. R.7 Use mathematics to show and understand physical phenomena (i.e., determine the perimeter of a bulletin board)
- 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. R.3 Read, interpret, and extend external models

- 6. R.4 Use standard and nonstandard representations with accuracy and detail**
- 6. RP.3 Investigate conjectures, using arguments and appropriate mathematical terms**
- 6. PS.4 Act out or model with manipulative activities involving mathematical content from literature**

Vocabulary

- | | |
|----------------------------------|---|
| counterexample | mathematical phenomena |
| draw a picture | describe |
| explain | identity |
| invalid approach | numerically |
| language of logic | consolidate |
| model using manipulatives | equivalent customary units of capacity |
| reflect | metric system |
| verify results | metric units of capacity |
| conjecture | customary units of capacity |
| accurately label work | personal reference for capacity |
| clarify questions | measure capacity |
| comprehend | cup |
| decode | gallon |
| organize work | pint |
| apply | quart |
| connections | liter |
| draw conclusions | milliliter |
| model problems | |

Algebra /Geometry/ Statistics

(Post-March)

Content Strands: Performance Indicators

- 6. A.2 Use substitution to evaluate algebraic expressions (may include exponents of one, two and three)**
- 6. A.5 Solve simple proportions within context**
- 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. 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.4 Determine and justify the most appropriate graph to display a given set of data (pictograph, bar graph, line graph, histogram, or circle graph)**
- 6. S.2 Record data in a frequency table**
- 6. S.3 Construct Venn diagrams to sort data**
- 6. S.10 Determine the probability of dependent events**
- 6. S.9 List possible outcomes for compound 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 probability

Process Strands: Performance Indicators

- 6. PS.15 Make organized lists or charts to solve numerical problems**
- 6. R.8 Use mathematics to show and understand social phenomena (i.e., construct tables to organize data showing book sales)**
- 6. R.1 Use physical objects, drawings, charts, tables, graphs, symbols, equations, and objects created using technology as representation**
- 6. PS.16 Discuss with peers to understand a problem situation**
- 6. PS.17 Determine what information is needed to solve problems**
- 6. PS.11 Translate from a picture/diagram to a number or symbolic expression**
- 6. CM.3 Organize and accurately label work**
- 6. CN.4 Understand multiple representations and how they are related**
- 6. RP.7 Verify claims other students make, using examples and counterexamples when appropriate**
- 6. RP.6 Develop and explain an argument verbally, numerically, algebraically, and/or graphically**
- 6. PS.9 Understand the basic language of logic in mathematical situations (and, or, and not)**

Vocabulary

irrelevant/relevant information

logic

logical reasoning

argument

interpret

investigate

justify

distinguish

explain

extend

area

develop formulas

distance

geometric shape

geometry height

irregular polygon

length

perimeter

quadrilateral

rectangle

regular polygon

rhombus

square

trapezoid

triangle

width

coordinate geometry

coordinate plane

plot

point

quadrant

calculate volume

rectangular prism

volume

estimate: volume

arc

area

central angle

chord

circle

circumference

diameter

pi (symbol)

radius

sector

estimate: area/circumference

corresponding sides

proportional reasoning

vertex

similar triangles

Analyze

apply

discuss

formulate

observing patterns
process of elimination
solve a simpler problem
trial and error
develop formulas
manipulatives
mathematical relationships
methods of proof
verify claims of others
models
rationale
verbal/written symbols
model
investigate
explore physical phenomena
mathematical phenomena
mathematical relationships
conjecture
algebra
algebraic expression
algebraic solution
equation
evaluate
formula
circle graph
data
frequency
frequency table
histogram
interpret graphs
line graph
mean
median
mode
range
record data
sampling
statistics
Venn diagram
compound events
dependent events
favorable outcomes
fundamental counting principle

inverse operations
input values
interest
proportion
solve
substitute
translate
variable
verbal expression
numeric expression
inequality
mathematical statement
collaboration
solution
strategies
valid approach
write an equation
algebraically
analyze
extend
mathematical relationships
solution
reasonableness of a solution
work backward
monitor
justify
population
possible outcome
predict
probability
record data
differentiate
draw a graph
organize chart/list
graphically (special cases)
verbally
apply
coherent
explore
impossible outcomes
non-standard/standard representations
social phenomena