

Pocantico Hills School District

Grade 7 Math Curriculum Draft

Number Sense

(Pre-March)

Content Strands: Performance Indicators

7.N.1 Distinguish between the various subsets of real numbers (counting/natural numbers, whole numbers, integers, rational numbers, and irrational numbers)

7.N.2 Recognize the difference between rational and irrational numbers (i.e., explore different approximations of π)

7.N.3 Place rational and irrational numbers (approximations) on a number line and justify the placement of the numbers

7.N.17 Classify irrational numbers as non-repeating/non-terminating decimals

7.N.8 Find the common factors and greatest common factor of two or more numbers

7.N.9 Determine multiples and least common multiple of two or more numbers

7.N.4 Develop the laws of exponents for multiplication and division

7.N.10 Determine the prime factorization of a given number and write in exponential form

7.N.5 Write numbers in scientific notation

7.N.6 Translate numbers from scientific notation into standard form

7.N.7 Compare numbers written in scientific notation

7.N.14 Develop a conceptual understanding of negative and zero exponents with a base of ten and relate to fractions and decimals (i.e., $10^{-2} = .01 = 1/100$)

7.N.15 Recognize and state the value of the square root of a perfect square (up to 225)

7.N.16 Determine the square root of non-perfect squares using a calculator

7.N.18 Identify the two consecutive whole numbers between which the square root of a non-perfect square whole number less than 225 lies (with and without the use of a number line)

7.N.19 Justify the reasonableness of answers using estimation

7.N.11 Simplify expressions using order of operations *Note: Expressions may include absolute value and/or integral exponents greater than 0.*

7.N.13 Add and subtract two integers (with and without the use of a number line)

7.N.12 Add, subtract, multiply, and divide integers

Process Strands: Performance Indicators

7.PS.3 Understand and demonstrate how written symbols represent mathematical ideas

7.PS.13 Set expectations and limits for possible solutions

7.PS.14 Determine information required to solve the problem

7.CM.3 Organize and accurately label work

7.CM.6 Analyze mathematical solutions shared by others

- 7.CN.9 Recognize and apply mathematics to other disciplines, areas of interest, and societal issues**
- 7.CN.1 Understand and make connections among multiple representations of the same mathematical idea**
- 7.R.3 Recognize, compare, and use an array of representational forms**
- 7.CM.5 Answer clarifying questions from others**

Vocabulary

- | | |
|---|------------------------------------|
| <i>approximation</i> | <i>consecutive integers</i> |
| <i>counting numbers</i> | <i>coefficient</i> |
| <i>exponential form</i> | <i>exponents</i> |
| <i>integers</i> | <i>integral irrational numbers</i> |
| <i>law of exponents for division and multiplication</i> | |
| <i>multiple</i> | <i>whole numbers</i> |
| <i>natural numbers</i> | <i>non-perfect squares</i> |
| <i>non-repeating decimal</i> | <i>non-terminating decimal</i> |
| <i>number systems</i> | <i>order of operations</i> |
| <i>perfect square</i> | <i>pi</i> |
| <i>prime factorization</i> | <i>rational numbers</i> |
| <i>real numbers</i> | <i>scientific notation</i> |
| <i>simplify</i> | <i>square root</i> |
| <i>standard form of a number</i> | |

Measurement and Geometry

Content Strands: Performance Indicators

- 7.M.2 Convert capacities and volumes within a given system**
- 7.M.3 Identify customary and metric units of mass**
- 7.M.12 Determine personal references for customary /metric units of mass**
- 7.M.4 Convert mass within a given system**
- 7.M.13 Justify the reasonableness of the mass of an object**
- 7.M.9 Determine the tool and technique to measure with an appropriate level of precision: mass**
- 7.M.10 Identify the relationships between relative error and magnitude when dealing with large numbers (i.e., money, population)**
- 7.G.3 Identify the two-dimensional shapes that make up the faces and bases of three-dimensional shapes (prisms, cylinders, cones, and pyramids)**
- 7.G.2 Calculate the volume of prisms and cylinders, using a given formula and a calculator**
- 7.M.11 Estimate surface area**
- 7.G.4 Determine the surface area of prisms and cylinders, using a calculator and a variety of methods**
- 7.A.6 Evaluate formulas for given input values (surface area, rate, and density problems)**

- 7.G.7 Find a missing angle when given angles of a quadrilateral
- 7.A.9 Build a pattern to develop a rule for determining the sum of the interior angles of polygons
- 7.M.8 Draw central angles in a given circle using a protractor (circle graphs)- Post March
- 7.G.1 Calculate the radius or diameter, given the circumference or area of a circle

Process Strands: Performance Indicators

- 7.PS.11 Work in collaboration with others to solve problems
- 7.PS.15 Choose methods for obtaining required information
- 7.PS.14 Determine information required to solve the problem
- 7.RP.4 Provide supportive arguments for conjectures
- 7.RP.6 Support an argument by using a systematic approach to test more than one case
- 7.CM.7 Compare strategies used and solutions found by others in relation to their own work
- 7.CM.9 Increase their use of mathematical vocabulary and language when communicating with others
- 7.CN.2 Recognize connections between subsets of mathematical ideas
- 7.CN.5 Understand how concepts, procedures and mathematical results in one area of mathematics can be used to solve problems in other areas of mathematics
- 7.R.6 Use representations to explore problem situations
- 7.R.5 Use standard and non-standard representations with accuracy and detail

Vocabulary

- | | |
|--|--------------------------------------|
| <i>adjacent side of a triangle</i> | <i>protractor</i> |
| <i>altitude</i> | <i>area of a circle</i> |
| <i>base of a 2-dimensional shape</i> | <i>base of a 3-dimensional shape</i> |
| <i>calculate</i> | <i>circumference</i> |
| <i>diameter</i> | <i>dimensions</i> |
| <i>exterior angle</i> | |
| <i>faces and bases of cones, cylinders, prisms, and pyramids</i> | |
| <i>hypotenuse</i> | <i>inequality</i> |
| <i>interior angle</i> | <i>polygon</i> |
| <i>surface area of prisms/cylinders</i> | <i>volume of cylinder/prism</i> |
| <i>convert capacity within a given system</i> | <i>rate</i> |
| <i>convert volume within a given system</i> | <i>evaluate</i> |
| <i>customary units of mass</i> | <i>magnitude</i> |
| <i>metric units of mass</i> | <i>density</i> |
| <i>personal references for units of mass</i> | |

Statistics and Probability

Content Strands: Performance Indicators

- 7.S.1 Identify and collect data using a variety of methods**
- 7.S.2 Display data in a circle graph**
- 7.S.6 Read and interpret data represented graphically (circle graph)**
- 7.S.6 Read and interpret data represented graphically (pictograph, bar graph, histogram, line graph, double line/bar graphs)**
- 7.S.7 Identify and explain misleading statistics and graphs**
- 7.S.3 Convert raw data into double bar graphs and double line graphs**
- 7.S.4 Calculate the range for a given set of data**
- 7.S.5 Select the appropriate measure of central tendency**
- 7.S.8 Interpret data to provide the basis for predictions and to establish experimental probabilities**
- 7.S.9 Determine the validity of sampling methods to predict outcomes**
- 7.S.10 Predict the outcome of an experiment**
- 7.S.11 Design and conduct an experiment to test predictions**
- 7.S.12 Compare actual results to predicted results**

Process Strands: Performance Indicators

- 7.PS.5 Make conjectures from generalizations**
- 7.PS.12 Interpret solutions within the given constraints of a problem**
- 7.PS.1 Use a variety of strategies to understand new mathematical content and to develop more efficient methods**
- 7.PS.17 Evaluate the efficiency of different representations of a problem**
- 7.RP.8 Apply inductive reasoning in making and supporting mathematical conjectures**
- 7.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**
- 7.CM.1 Provide a correct, complete, coherent, and clear rationale for thought process used in problem solving**
- 7.CN.6 Recognize and provide examples of the presence of mathematics in their daily lives**
- 7.CN.8 Investigate the presence of mathematics in careers and areas of interest**
- 7.CN.9 Recognize and apply mathematics to other disciplines, areas of interest, and societal issues**
- 7.R.4 Explain how different representations express the same relationship**
- 7.R.10 Use mathematics to show and understand social phenomena (i.e., determine profit from sale of yearbooks)**
- 7.R.11 Use mathematics to show and understand mathematical phenomena (i.e., use tables, graphs, and equations to show a pattern underlying a function)**
- 7.RP.3 Evaluate conjectures by distinguishing relevant from irrelevant information to reach a conclusion or make appropriate estimates**
- 7.RP.5 Develop, verify and explain an argument, using mathematical ideas and language**

Vocabulary

circle graph

double bar graph

measures of central tendency

predict

validity of sample methods

function

conduct

double line graph

misleading

range

equation

Algebra

Content Strands: Performance Indicators

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

7.A.5 Solve one-step inequalities (positive coefficients only)

7.G.10 Graph the solution set of an inequality on a number line
(positive coefficients only)

Process Strands: Performance Indicators

7.PS.4 Observe patterns and formulate generalizations

7.PS.6 Represent problem situations verbally, numerically, algebraically, and graphically

7.RP.7 Devise ways to verify results or use counterexamples to refute incorrect statements

7.CM.10 Use appropriate language, representations, and terminology when describing objects, relationships, mathematical solutions, and rationale

7.CM.11 Draw conclusions about mathematical ideas through decoding, comprehension and interpretation of mathematical visuals, symbols, and technical writing

7.CN.7 Apply mathematical ideas to problem situations that develop outside of mathematics

7.R.2 Explain, describe, and defend mathematical ideas using representations

7.R.8 Use representation as a tool for exploring and understanding mathematical ideas

Vocabulary

algebraic equation

algebraic pattern

solution set verbal expression

algebraically

algebraic expression

inequality

positive coefficient

Algebra & Geometry

(Post-March)

Content Strands: Performance Indicators

- 7.A.7 Draw the graphic representation of a pattern from a table of data**
- 7.A.8 Create algebraic patterns using charts/tables, graphs, equations, and expressions**
- 7.A.10 Write an equation to represent a function from a table of values**
- 7.A.2 Add and subtract monomials with exponents of one**
- 7.A.3 Identify a polynomial as an algebraic expression containing one or more terms**
- 7.A.4 Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation**
- 7.G.5 Identify the right angle, hypotenuse, and legs of a right triangle**
- 7.G.6 Explore the relationship between the lengths of the three sides of a right triangle to develop the Pythagorean Theorem**
- 7.G.8 Use the Pythagorean Theorem to determine the unknown length of a side of a right triangle**
- 7.G.9 Determine whether a given triangle is a right triangle by applying the Pythagorean Theorem and using a calculator**

Process Strands: Performance Indicators

- 7.PS.7 Understand that there is no one right way to solve mathematical problems but that different methods have advantages and disadvantages**
- 7.PS.8 Understand how to break a complex problem into simpler parts or use a similar problem type to solve a problem**
- 7.PS.9 Work backwards from a solution**
- 7.RP.1 Recognize that mathematical ideas can be supported by a variety of strategies**
- 7.CM.2 Provide an organized argument which explains rationale for strategy selection**
- 7.CN.3 Connect and apply a variety of strategies to solve problems**
- 7.CN.4 Model situations mathematically using representations to draw conclusions and formulate new situations**
- 7.R.1 Use physical objects, drawings, charts, tables, graphs, symbols, equations, and objects created using technology as representations**
- 7.R.7 Investigate relationships between different representations and their impact on a given problem**
- 7.CM.8 Formulate mathematical questions that elicit, extend, or challenge strategies, solutions, and/or conjectures of others**

Vocabulary

binomial
input values
monomial
trinomial
solution set

combine like terms
like terms
polynomial
solution
table of values

term

legs of a right triangle

Measurement

Content Strand: Performance Indicators

7.M.1 Calculate distance using a map scale

7.M.5 Calculate unit price using proportions

7.M.6 Compare unit prices

7.M.7 Convert money between different currencies with the use of an exchange rate table and a calculator

Process Strands: Performance Indicators

7.PS.2 Construct appropriate extensions to problem situations

7.PS.10 Use proportionality to model problems

7.PS.16 Justify solution methods through logical argument

7.RP.2 Use mathematical strategies to reach a conclusion

7.R.9 Use mathematics to show and understand physical phenomena (i.e., make and interpret scale drawings of figures or scale models of objects)

Vocabulary

calculate distance

compare unit prices

exchange rate table

calculate unit price

convert money

map scale