

Boston Public Schools
Course 436-Grade 6 Mathematics – Revised Using CMP2 Materials
Scope and Sequence
2006 – 2007

The Scope and Sequence is a guide to be used by teachers when planning daily and weekly lessons. The scope and sequence sets forth the content of the mathematics curriculum and a suggested number of days for each topic. It is based on the suggested timeline developed by the publishers of our curriculum materials with adjustments made to reflect the particular needs of our district.

It is expected that the number of days that teachers and students will need to complete the topics listed in the scope and sequence will vary from class to class. Each term has discretionary days that teachers may use flexibly as the need arises to spend additional time on a topic and/or engage in enrichment activities. There are 26 discretionary days in this scope and sequence.

The scope and sequence includes key dates that teachers can use as reference points to determine the likelihood that a class will complete the mathematics curriculum for this course. Teachers and administrators should make regular use of the scope and sequence as one measure of assessing whether or not students are accessing the full curriculum for a course.

Note: Specific dates for the Formative Assessment and the Open Response section of the Final Exam will be forthcoming.

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
Data About Us			
1	1: Looking at Data	4 days	<ul style="list-style-type: none"> ◦ Use tables, line plots and bar graphs to display data. ◦ Use measures of central tendency and measures of spread to describe data. ◦ Describe the shape of data and how the median responds to changes in the number and magnitude of data values.
1	2:Types of Data	1 day	<ul style="list-style-type: none"> ◦ Note and distinguish between categorical and numerical data. ◦ Use bar graphs to display categorical and numerical data. ◦ Understand how the median and mode relate to numerical and categorical data.
1	3:Using Graphs to Group Data	2 days	<ul style="list-style-type: none"> ◦ Use Stem and leaf plots to group numerical data in intervals. ◦ Use ordered data in a stem plot to locate the median and mode. ◦ Compare two data sets using back to back stem-and-leaf plots. ◦ Compare two sets of data using statistics, such as median and mode.
1	4:Coordinate Graphs	2 days	<ul style="list-style-type: none"> ◦ Implement process of statistical investigation to answer questions. ◦ Analyze data using coordinate graphs to explore relationships among variables. ◦ Explore intervals for scaling the vertical and horizontal axis.
1	5:Mean	3 days	<ul style="list-style-type: none"> ◦ Understand mean as a number that balances a distribution. ◦ Create distributions with a designated mean. ◦ Find the mean of a set of data. ◦ Use the mean of a set of data. ◦ Distinguish between the mean, median, and mode as ways to describe what is typical about a set of data.
1	Reflections	1 day	

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
1	End Module/ Chapter Test	1 day	
End Data About Us		14 days	
Bits and Pieces I			
1	1:Fund Raising Fractions	5 days	<ul style="list-style-type: none"> ◦ Use the part-whole interpretation of fractions to create a set of fraction strips. ◦ Relate the fraction-strip model to the part-whole interpretation of fractions and to the symbolic representation of fractions. ◦ Begin to investigate equivalent fractions. ◦ Understand the meaning of fractions larger than a whole. ◦ Use Fractions to find fraction parts of whole-number quantities.
1	2:Sharing & Comparing Fractions	5 days	<ul style="list-style-type: none"> ◦ Recognize the role of the numerator and denominator when partitioning. ◦ Use fractions as operators. ◦ Understand that a place on a number line can have more than one fraction name and to use fractions to measure distance on a number line. ◦ Develop strategies for finding equivalent fractions. ◦ Develop strategies for comparing and ordering fractions. ◦ Understand the structure of fractions greater than one.
1	3:Moving Between Fractions and Decimals	5 days	<ul style="list-style-type: none"> ◦ Understand relationship between tenths and hundredths. ◦ Represent decimals as fractions with denominators of ten and one hundred. ◦ Read and write fractions and decimal numbers. ◦ Develop ways to find a decimal between 2 given decimals. ◦ Represent fractions and decimals on a hundreds grid. ◦ Develop strategies for comparing and ordering decimals. ◦ Recognize fractions as division problems.
1	4:Working with Percents	5 days	<ul style="list-style-type: none"> ◦ Use fraction partitioning to make sense of percents. ◦ Develop strategies to use in comparisons where the whole is less than one. ◦ Relate and develop connections between fractions, decimals, and percents. ◦ Develop strategies for expressing data in percent form. ◦ Work with situations where the whole is sometimes greater than 100 or less than 100.
1	Reflections	1 day	
1	End Module/ Chapter Test	1 day	
End Bits and Pieces One		22 days	
1	End Term One	45 days	Term ends on November 9, 2006 34 instructional Days 2 End Module/ Chapter Test days 8 discretionary days 1 formative assessment

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
Shapes and Designs			
2	1: Bees and Polygons	2 days	<ul style="list-style-type: none"> ◦ Identify and define regular polygons, sides of a polygon, angles of a polygon, and vertices of a polygon. ◦ Discover through exploration and demonstration, which regular polygons can be used to tile a plane. ◦ Discover and demonstrate combinations of regular polygons that can be used to tile a plane.
2	2: Building Polygons	3 days	<ul style="list-style-type: none"> ◦ Demonstrate understanding that triangles are stable figures that keep their shape under stress. ◦ Discover through experimentation and demonstration “the triangle inequality” – the sum of the lengths of any two sides of a triangle is greater than the third. ◦ Discover and demonstrate that quadrilaterals and other polygons are not stable shapes and become distorted under stress. ◦ Discover and demonstrate that the sum of any three sides of a quadrilateral is greater than any fourth side.
2	3: Polygons and Angles – omit Inv. 3.4 and 3.6	3 days	<ul style="list-style-type: none"> ◦ Develop and demonstrate an understanding of what an angle is and find examples of angles in the real world. ◦ Demonstrate understanding that the measure of an angle is the size of the opening or turn between its sides. ◦ Identify that a full turn is divided into 360°, that a half turn measures 180° and that a quarter turn measures 90°. ◦ Find precise angle measures using an angle ruler. ◦ Use angle and angle measures in real life applications.
2	4: Polygon Properties and Tiling – Sect. 4.1-4.2 only	2 days	<ul style="list-style-type: none"> ◦ Use information about angles of polygons as number of sides increase. ◦ Discover angle sums for regular and irregular polygons.
2	Reflections	1 day	
2	End Module/ Chapter Test	1 day	
End Shapes and Designs		12 days	
Bits and Pieces II			
2	1: Estimating with Fractions	2 days	<ul style="list-style-type: none"> ◦ Develop estimation strategies for finding fraction and decimal sums. ◦ Use estimation in contextual situations where exact answer may not be needed to make an informed decision. ◦ Make decisions about whether an overestimate or an underestimate will suffice.

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
2	2: Adding and Subtracting Fractions	6 days	<ul style="list-style-type: none"> ◦ Use number sentences to express sums and differences. ◦ Explore the use of fractions as operators. (e.g. $\frac{2}{3}$ of 60 acres) ◦ Write number sentences to represent situations for adding and subtracting fractions and mixed numbers. ◦ Explore the inverse relationship between the addition and subtraction of Fractions. ◦ Develop and use efficient strategies for adding and subtracting fractions and mixed numbers. ◦ Develop an algorithm for adding and subtracting fractions.
2	3: Multiplying with Fractions	5 days	<ul style="list-style-type: none"> ◦ Estimate the products of fractions. ◦ Use models to represent the product of two fractions. ◦ Understand that finding a fraction <i>of</i> a number means multiplication. ◦ Develop and use efficient strategies and models for multiplying combinations of fraction, whole numbers, and mixed numbers. ◦ Determine when multiplication is an appropriate operation. ◦ Explore the relationships between two numbers and their product. ◦ Develop and use an efficient algorithm to solve any fraction multiplication problem.
2	4: Dividing with Fractions	5 days	<ul style="list-style-type: none"> ◦ Use models to represent division situations (a whole number divided by a fraction, a fraction divided by a whole number, and a fraction divided by a fraction.) ◦ Develop and use strategies for dividing a whole number by a fraction, a fraction by a whole number, and a fraction by a fraction. ◦ Understand when division is the appropriate operation. ◦ Develop an efficient algorithm to solve any fraction division problem. ◦ Explore the inverse operation of multiplication and division.
2	Reflections	1 day	
2	End Module/ Chapter Test	1 day	
End Bits and Pieces II		20 days	
Covering and Surrounding			
2	1: Measuring Perimeter and Area	4 days	<ul style="list-style-type: none"> ◦ Demonstrate that the area of an object is the number of unit squares needed to cover it and the perimeter of an object is the number of units of length needed to surround it. ◦ Demonstrate that two figures with the same area may have different perimeters and that two figures of the same perimeter may have different areas. ◦ Visualize what changes occur when tiles forming a figure are rearranged, added or subtracted.
2	2: Measuring Odd Shapes	1 day	<ul style="list-style-type: none"> ◦ Demonstrate understanding of the concepts of area and perimeter. ◦ Develop and apply techniques for estimating areas and perimeters of non-geometric figures. ◦ Develop strategies for organizing and comparing data. ◦ Use graphs to organize data and to make predictions.

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
2	3: Constant Area – Changing Perimeter	2 days	<ul style="list-style-type: none"> ◦ Demonstrate understanding of how the perimeter of rectangles can vary even when the area is held constant. ◦ Construct diagrams and tables to organize and represent data. ◦ Apply the concepts of maxima and minima to finding the largest and smallest perimeters for rectangles of a fixed area.
2	4: Constant Perimeter, Changing Area	2 days	<ul style="list-style-type: none"> ◦ Learn that the areas of rectangles with a fixed perimeter can vary considerably. ◦ Construct diagrams and tables to organize and represent data. ◦ Find the minimum and maximum areas of rectangles with a fixed perimeter. ◦ Distinguish the case of fixed area from the case of fixed perimeter. ◦ Continue to develop a conceptual understanding of area and perimeter.
2	End Term Two	47 days	<p>Term ends January 31, 2007 39 instructional days 2 End Module/ Chapter Test days 6 discretionary days</p>
3	MID-YEAR EXAMINATION	2 days	<p>Administer Mid-Year Exam-Day One Review Mid-Year Exam-Day Two</p>
3	5: Measuring Parallelograms	3 days	<ul style="list-style-type: none"> ◦ Demonstrate that the areas of rectangles with fixed perimeter can vary considerably. ◦ Construct diagrams and tables to organize and represent data. ◦ Find the maximum and minimum areas of rectangles with a fixed perimeter. ◦ Distinguish the case of fixed area from fixed perimeter.
3	6: Measuring Triangles	4 days	<ul style="list-style-type: none"> ◦ Discover relationships between triangles and parallelograms. ◦ Use relationships between rectangles and parallelograms and triangles and parallelograms to develop techniques or formulas for finding areas and perimeters of parallelograms. ◦ Apply techniques for finding areas and perimeters of parallelograms, rectangles, and triangles to a variety of problem solving situations.
3	7: Going Around In Circles	5 days	<ul style="list-style-type: none"> ◦ Develop techniques for estimating the area of a circle. ◦ Discover that it takes slightly more than three diameters to equal the circumference of a circle. ◦ Discover that it takes slightly more than three radius squares to equal the area of the circle. ◦ Use ideas about area and perimeter to solve practical problems.
3	Reflections	1 day	
3	End Module/ Chapter Test	1 day	
End Covering and Surrounding		23 days	

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
Bits and Pieces III			
3	1: Decimals – More or Less!	4 days	<ul style="list-style-type: none"> ○ Estimate strategies for finding decimal sums and develop approaches to finding exact decimal sums and differences. ○ Develop place value understanding of decimal addition and subtraction. ○ Develop strategies and solve problems for adding and subtracting decimal numbers. ○ Connect strategies for addition and subtraction of decimals to those of fractions with powers of ten in the denominator ○ Develop and use efficient algorithms for adding and subtracting decimals. ○ Explore the inverse relationship between addition and subtraction in decimal settings.
3	2: Decimal Times	4 days	<ul style="list-style-type: none"> ○ Estimate the relative size of a decimal product prior to finding an exact answer. ○ Develop place value understanding of decimal multiplication. ○ Solve problem that require decimal multiplication. ○ Consider how finding the decimal part of and a fraction part of a quantity affects the relative size of a product. ○ Use place value to reason about decimal multiplication. ○ Explore the relationship between factors and products in decimals multiplication. ○ Develop estimation strategies for finding decimal products. ○ Generalize an approach to placing the decimal point into a product that involves counting and adding decimal places. ○ Consider when various strategies are useful for finding decimal products. ○ Understand what happens to place value and the position of the decimal when you multiply by products of ten.
3	The Decimal Divide	5 days	<ul style="list-style-type: none"> ○ Choose the correct operation to solve a problem. ○ Use models and context to solve division problems. ○ Estimate to find approximate solutions. ○ Use the relationship between fractions and decimals to develop an understanding of decimal division. ○ Use efficient algorithms for dividing decimals ○ Explore the relationship between multiplication and division in fact families. ○ Understand and predict the decimal representation of a fraction (terminating or repeating.)
3	4:Using Percents	4 days	<ul style="list-style-type: none"> ○ Understand that a percent is a decimal fraction with a denominator of 100. ○ Represent \$1.00 as 100 pennies, and relate partitioning to number line in to 100 parts. ○ Represent percents as decimals and use decimal computation to compute percents. ○ Explore the relationship between 1% and 10%, and use these to compute 5%, 15%, and 20%. ○ Work backwards to find the amount of the bill if you know the tip and the percent of tip for the bill. ○ Use percents in estimating or computing taxes, tips, and discounts. ○ Find what percent one number is of another number. ○ Solve problems using percents,

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
3	5:More About Percents	2 days	<ul style="list-style-type: none"> ○ Develop a strategy for finding the percent of discount an amount taken of a priced represents. ○ Use percents in estimating taxes, tips, and discounts. ○ Solve problems involving percents. ○ Make and interpret circle graphs to represent data.
3	Reflections	1 day	
3	End Module/ Chapter Test	1 day	
End Bits and Pieces II		21 days	
Variables and Patterns			
3	1:Variables and Coordinate Graphs	3 days	<ul style="list-style-type: none"> ○ Collect data from an experiment and make a table and a graph to organize and represent the data. ○ Search for explanations for patterns and variations in data. ○ Understand that a variable is a quantity that changes and to recognize variables in the real world. ○ Understand that in order to make a graph that shows the relationship between two variables, you need to identify the two variables, choose an axis for each, and select an appropriate scale for each axis. ○ Interpret information given in a graph.
	Open Response	1 day	○ Final Exam - Open Response
3	End Term Three	46 days	Term ends on April 13, 2007 36 instructional days 2 End Module/ Chapter Test days 5 discretionary days. 2 mid-year exam days 1 open response –final exam day
4	2:Graphing Change	5 days	<ul style="list-style-type: none"> ○ Make sense of data given in the form of a table or a graph. ○ Read a narrative of a situation that changes over time and make a table and graph that represent these changes. ○ Read data given in a table and make a graph from the table. ○ Compare tables, graphs, and narratives and understand the advantages and disadvantages of each form of representation.
4	3: Analyzing Graphs and Tables	4 days	<ul style="list-style-type: none"> ○ Change the form of representation of data from tables to graphs and vice versa. ○ Search for patterns of change. ○ Describe situations that change in predictable ways, write rules in words for predicting the change. ○ Compare forms of representation of data.
4	4: Patterns and Rules	3 days	<ul style="list-style-type: none"> ○ Understand the relationship between rate, time, and distance. ○ Represent information regarding rates in tables and graphs and to use tables and graphs to compare rates. ○ Search for patterns of predictable change. ○ Learn to express in words and symbols situations that change in predictable ways.
4	Reflections	1 day	
4	End Module/ Chapter Test	1 day	

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
	End Variables and Patterns	17 days	
How Likely Is It?			
4	MCAS REVIEW	5 days	Review for Grade Six MCAS
4	1: A First Look at Chance	2 days	<ul style="list-style-type: none"> ◦ Build intuition that probability, or chance, has to do with events that are uncertain but that have a pattern of regularity over the long run. ◦ Determine relative frequencies from experimental data and use them to predict behavior over the long run. ◦ Observe that small numbers of trials may produce wide variation in results. ◦ Display collected data in graphs or tallies and use them to find experimental probabilities. ◦ Recognize equally likely events.
4	2: More Experiments with Chance	2 days	<ul style="list-style-type: none"> ◦ Gain experience finding experimental probabilities of unequally likely events. ◦ Understand that chance (probability) is an estimate of behavior over the long run. ◦ Understand that to make good decisions based on experimental probabilities, the probabilities must be based on a large number of trials. ◦ Understand that a game of chance is fair only if each player has the same chance of winning, not just a possible chance of winning.
4	3: Using Spinners to predict chances	3 days	<ul style="list-style-type: none"> ◦ Develop strategies for finding experimental probabilities with spinners. ◦ Understand that to make good decisions based on experimental probabilities, the probabilities must be based on a large number of trials.
4	4:Theoretical Probabilities	3 days	<ul style="list-style-type: none"> ◦ Understand the two ways to obtain probabilities: by gathering data from experiments (experimental probability) and by analyzing possible and favorable outcomes(theoretical probability). ◦ Understand the relationship between experimental and theoretical probabilities: when an experimental probability is based on a large number of trials, it is a good estimate of the theoretical probability. ◦ Develop strategies for finding theoretical probabilities, such as making an organized list of all possible outcomes. ◦ Develop an understanding of the word random.
4	5: Analyzing Games of Chance	3 days	<ul style="list-style-type: none"> ◦ Understand the two ways to obtain probabilities: by gathering data from experiments (experimental probability) and by analyzing possible and favorable outcomes (theoretical probability). ◦ Develop strategies for finding theoretical probabilities, such as making an organized list of all possible outcomes. ◦ Gain a better understanding of what it means for events to be equally likely in situations in which individual outcomes are combined to obtain the events of interest.
4	Reflections	1 day	
4	End Module/ Chapter Test	1 day	
End How Likely Is It?		15 days	

T E R M	Investigation	Days	Learning Outcomes After completing each section, students will be able to:
	FINAL EXAM	1 day	Administer final examination
	End Term Four	45 days	Term ends on or about June 21, 2007 (This date may vary due to school cancellations during the year.) 32 instructional /days 2 End Module/ Chapter Test days. 7 discretionary days. 1 final exam day
	End Academic Year	days	School year ends on June 21, 2007 141 instructional days 8 End Module/ Chapter Test days 26 discretionary days. 5 district assessment days