Math and More for Grades 5/6
NCTM Principles and Standards Correlation

Standard – Algebra

Instructional programs from prekindergarten through grade 12 should enable all students to:	Expectations In grades 3 through 5 all students should -	Patterns and Rules Investigations
Understand patterns, relations, and functions	• describe, extend, and make generalizations about geometric and numeric patterns;	1, 2, 3, 4, 5
	• represent and analyze patterns and functions, using words, tables, and graphs.	1, 2, 3, 4, 5
Represent and analyze mathematical situations and structures using algebraic symbols	• identify such properties as commutativity, associativity, and distributivity and use them to compute with whole numbers;	
	• represent the idea of a variable as an unknown quantity using a letter or symbol;	1, 3, 4, 5
	• express mathematical relationships using equations.	1, 3, 5
Use mathematical models to represent and understand quantitative relationships	• model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.	1, 2, 3, 4, 5
Analyze change in various contexts	• investigate how a change in one variable relates to a change in a second variable	1, 2, 3, 4, 5
	• identify and describe situations with constant or varying rates of change and compare them.	1

Instructional programs from prekindergarten through grade 12 should enable all students to:	Expectations In grades 6 through 8 all students should -	Patterns and Rules Investigations
Understand patterns, relations, and functions	• represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules;	1, 2, 3, 4, 5
	• relate and compare different forms of representation for a relationship;	1, 2, 3, 4, 5
	• identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.	
Represent and analyze mathematical situations and structures using algebraic symbols	• develop an initial conceptual understanding of different uses of variables;	1, 3, 4, 5
	• explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope	
	• use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships;	4, 5
	• recognize and generate equivalent forms for simple algebraic expressions and solve linear equations	4, 5
Use mathematical models to represent and understand quantitative relationships	• model and solve contextualized problems using various representations, such as graphs, tables, and equations	1, 2, 3, 4, 5
Analyze change in various contexts	• use graphs to analyze the nature of changes in quantities in linear relationships	

Standard – Geometry

Instructional programs from prekindergarten through grade 12 should enable all students to:	Expectations In grades 3 through 5 all students should -	Tiles and Tessellations Investigations
Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	• identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes;	2
	• classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids;	2
	• investigate, describe, and reason about the results of subdividing, combining, and transforming shapes;	1, 2
	• explore congruence and similarity;	1, 2, 3
	• make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.	1, 2, 3, 4, 5
Specify locations and describe spatial relationships using coordinate geometry and other representational systems	• describe location and movement using common language and geometric vocabulary;	1, 2, 3, 4, 5
	• make and use coordinate systems to specify locations and to describe paths;	
	• find the distance between points along horizontal and vertical lines of a coordinate system.	
Apply transformations and use symmetry to analyze mathematical situations	• predict and describe the results of sliding, flipping, and turning two-dimensional shapes;	3, 4, 5
	• describe a motion or series of motions that will show that two shapes are congruent;	3, 4, 5
	• identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs.	2
Use visualization, spatial reasoning, and geometric modeling to solve problems	• build and draw geometric objects;	1, 2, 3, 4, 5
	• create and describe mental images of objects, patterns, and paths;	1, 2, 3, 4, 5
	• identify and build a three-dimensional object for two-dimensional representation of that object;	
	• identify and build a two-dimensional representation of a three-dimensional object;	4
	• use geometric models to solve problems in other areas of mathematics such as number and measurement;	1
	• recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.	1, 2, 3, 4, 5

Standard – Geometry

Instructional programs from prekindergarten through grade 12 should enable all students to:	Expectations In grades 6 through 8 all students should -	Tiles and Tessellations Investigations
Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	• precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties;	1, 2
	• understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;	1, 2
	• create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.	1, 2, 3, 4, 5
Specify locations and describe spatial relationships using coordinate geometry and other representational systems	• use coordinate geometry to represent and examine the properties of geometric shapes;	
	• use coordinate geometry to examine special geometric shapes, such as regular polygons or those with pairs of parallel or perpendicular sides.	
Apply transformations and use symmetry to analyze mathematical situations	• describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling;	1, 2, 3, 4, 5
	• examine the congruence, similarity, and line or rotational symmetry of objects using transformations.	1, 2, 3, 4, 5
Use visualization, spatial reasoning, and geometric modeling to solve problems	• draw geometric objects with specified properties, such as side lengths or angle measures;	2, 3
	• use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume;	1
	• use visual tools such as networks to represent and solve problems;	1, 2, 3, 4, 5
	• use geometric models to represent and explain numerical and algebraic relationships;	2
	• recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.	1, 2, 3, 4, 5

Standard – Data Analysis and Probability

Instructional programs from prekindergarten through grade 12 should enable all students to:	Expectations In grades 3 through 5 all students should -	Statistics Investigations
Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	• design investigations to address a question and consider how data-collection methods affect the nature of the data set;	1, 2, 3, 4, 5
	• collect data using observations, surveys, and experiments;	3, 4, 5
	• represent data using tables and graphs such as line points, bar graphs, and line graphs;	1, 2, 3, 4, 5
	• recognize the differences in representing categorical and numerical data.	1, 2
Select and use appropriate statistical methods to analyze data	• describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed;	1, 2, 3
	• use measures of center, focusing on the median, and understand what each does and does not indicate about the data set;	2, 3, 4, 5
	• compare different representations of the same data and evaluate how well each representation shows important aspects of the data.	1, 2, 3, 4, 5
Develop and evaluate inferences and predictions that are based on data	• propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.	1, 2, 3, 4, 5
Understand and apply basic concepts of probability	• describe events as likely or unlikely and discuss the degree of likelihood using such words as certain, equally likely, and impossible;	4
	• predict the probability of outcomes of simple experiments and test the predictions;	4
	• understand that the measure of the likelihood of an event can be represented by a number from 0 to 1.	4

Standard – Data Analysis and Probability

Instructional programs from prekindergarten through grade 12 should enable all students to:	Expectations In grades 6 through 8 all students should -	Statistics Investigations
Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	• formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population;	1, 2, 3, 4, 5
	• select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots	
Select and use appropriate statistical methods to analyze data	• find, use, and interpret measures of center and spread, including mean and interquartile range;	2, 3, 4, 5
	• discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.	
Develop and evaluate inferences and predictions that are based on data	• use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken;	1, 2, 3, 4, 5
	• make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit;	
	• use conjectures to formulate new questions and plan new studies to answer them.	1, 2, 3, 4, 5
Understand and apply basic concepts of probability	• understand and use appropriate terminology to describe complementary and mutually exclusive events;	4
	• use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations;	4
	• compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.	