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# Introduction

The following Mathematics Scope and Sequence is meant to provide a holistic picture of the Kindergarten through Eighth Grade student's objectives. This curriculum reflects changes in accordance with the New York State *Learning Standards for Mathematics, Science, and Technology* as of May 2006. While this document is intended to guide specific content instruction, there may be appropriate situations when the grade level is altered to meet the needs of the learner.

The Five Content Strands of Mathematics are *Number Sense and Operations, Algebra, Geometry, Measurement, and Statistics and Probability* and are numbered according to the NYS *Learning Standards*. (See the codes as outlines in the specific grade level packets.) This Mathematics Standard (**MST-3**) is divided into the appropriate Key Ideas and Performance Indicators, as well as sample tasks for each. *Most importantly, the key ideas for each strand have been aligned with the Everyday Math program for K-6.* Whenever possible, page numbers from the 2003 edition have been cited in order to ensure cohesiveness within the program. While mathematical skills are taught, the teachers needs to correlate appropriate skills within content integrated within other content areas such as Science and Social Studies using *Essential Questions*.

Teachers are urged to utilize the Everyday Math spiral for teaching each unit. Concerns regarding below level achievement [*i.e., B(eginning) on a D(eveloping) or S(ecure) skill*] can be addressed through centers focused on explorations, games, as well as use of the *Everyday Math* software. Manipulatives that accompany the program should be maintained and extended, if necessary. It is important to note that **manipulatives do not teach mathematics themselves**. It is in their use, modeling, and guidance of an informed teacher that the manipulatives are effective to enhance student understanding.

Formative assessment is also necessary. Teaching is assessing. Find out **how** students are thinking about mathematical ideas and **what** they are able to accomplish. Instruction should mirror assessment and assessment should inform instruction. Monitoring of students' achievement is accomplished through data input and analysis into the *Everyday Math* unit spreadsheets.

## **Mathematics, Science, and Technology - Standard 3**

Students will:

- understand the concepts of and become proficient with the skills of mathematics;
- communicate and reason mathematically;
- become problem solvers by using appropriate tools and strategies;

through the integrated study of number sense and operations, algebra, geometry, measurement, and statistics and probability.

### ***The Five Content Strands***

#### ***Number Sense and Operations Strand***

Students will:

- a. understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems;
- b. understand meanings of operations and procedures, and how they relate to one another;
- c. compute accurately and make reasonable estimates.

#### ***Algebra Strand***

Students will:

- a. represent and analyze algebraically a wide variety of problem solving situations;
- b. perform algebraic procedures accurately;
- c. recognize, use, and represent algebraically patterns, relations, and functions.

#### ***Geometry Strand***

Students will:

- a. use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes;
- b. identify and justify geometric relationships, formally and informally;
- c. apply transformations and symmetry to analyze problem solving situations;
- d. apply coordinate geometry to analyze problem solving situations.

#### ***Measurement Strand***

Students will:

- a. determine what can be measured and how, using appropriate methods and formulas;
- b. use units to give meaning to measurements;
- c. understand that all measurement contains error and be able to determine its significance;
- d. develop strategies for estimating measurements.

#### ***Statistics and Probability Strand***

Students will:

- a. collect, organize, display, and analyze data;
- b. make predictions that are based upon data analysis;
- c. understand and apply concepts of probability.

## Bands Within the Content Strands

### **Number Sense and Operations**

- Number Systems
- Number Theory
- Operations
- Estimation

### **Algebra**

- Variables and Expressions
- Equations and Inequalities
- Patterns, Relations, and Functions
- Coordinate Geometry
- Trigonometric Functions

### **Geometry**

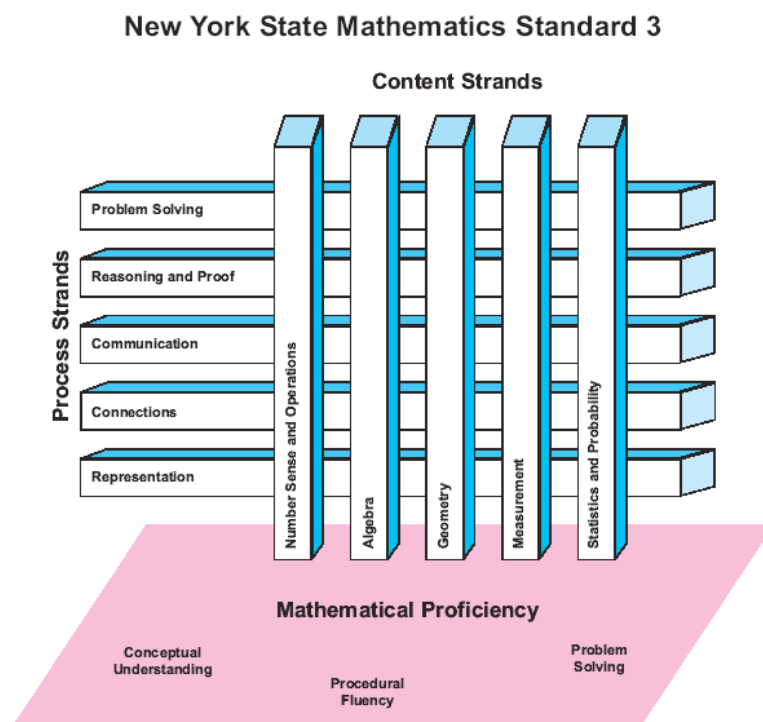
- Shapes
- Geometric Relationships
- Transformational Geometry
- Coordinate Geometry
- Constructions
- Locus
- Informal Proofs
- Formal Proofs

### **Measurement**

- Units of Measurement
- Tools and Methods
- Units
- Error and Magnitude
- Estimation

### **Statistics and Probability**

- Collection of Data
- Organization and Display of Data
- Analysis of Data
- Predictions from Data
- Probability



Adapted from *Mathematics Framework for the 1996, 2000, and 2003 National Assessment of Educational Progress*.

# Kindergarten

## 3.1: Number Sense and Operations

**3.1a: Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.**

<b>Number Systems</b>			
<b>NEW YORK STATE LEARNING STANDARDS FOR EVERYDAY MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY</b>	<b>PAGE NUMBER</b>
K.N.1 Count the items in a collection and know the last counting word tells how many items are in the collection (1 to 10)	Number of the Day and Growing Number	Count	10
	Line Routine	Collection	20
	Simon Says	Items	21
	Listen and Count	Last	22
	Eating to Zero	How many?	23
	Number Board (0-10)		24
	Weather Observation Routine		26
	“This Old Man”		27
	“Feely” Bag or Box		28
	“Look and Find” (Numbers 1-10)		29
	Egg-Carton Mathematics		80
	Spin A Number (1-10)		
	Concentration with Number Cards and Dominoes		89
	Number Books: Writing Numbers 0-10		112
Counting Pairs of Objects		167	
Ordinal Numbers: Standing in Line		208	
K.N.2 Count out (produce) a collection of a specified size 1 to 10	Simon Says	Count out	20
	Listen and Count		21
	Number Board (0-10)		23
	“This Old Man”		26
	“Feely” Bag or Box		27
	“Look and Find” (Numbers 1-10)		28
	Egg-Carton Mathematics		29
	Number Books: Writing Numbers 0-10		112
Counting Pairs of Objects		167	
K.N.3 Numerically label a data set of 1 to 5	Listen and Count	Count backwards	21
	Finger Counting	Symbols	36
	Number Books: Writing Numbers 0-10		112
	Top It		170
K.N.4 Verbally count by 1’s to 20	Cleanup Count Routine		17
	Give the Next Number		33
	Teacher Number Card Activities		66
	Listen and 30 (10-20)		116
	Interrupted Counts (0-50)		118
	Counting Walks		119
	Counting with Calculators		126
	Counting On With Calculators		130
Interrupted Skip Counts (0-50)		174	

K.N.5 Verbally count backwards from 10	Partner Match Eating to Zero Countdowns Snacking Subtraction Interrupted Skip Counts (0-50) Counting Backward with Calculators Ascending and Descending Order Say the Next Number (Counting Backward)		12 22 34 87 118 189 289 291
K.N.6 Represent collections with a finger pattern up to 10	“This Old Man” Countdowns Review Numbers (0-10) Finger Counting Teen Partner Game (10-20) Count Fingers by 5s		26 34 35 36 82 175
K.N.7 Draw pictures or other informal symbols to represent a spoken number up to 10	“This Old Man” Telephone Book No-Mess Finger Painting Numbers in the Sand Writing on Backs Number Books Writing Numbers 0-10 Meet the Calculator How Many? Reminder for Tally Marks Class Collection Project		26 68 70 77 79 112 120 122 176 260
K.N.8 Draw pictures or other informal symbols to represent how many in a collection up to 10	Number Board (0-10) Finger Counting Number Books Writing Numbers 0-10 Reminder for Tally Marks Class Collection Project		23 36 112 176 260
K.N.9 Write numbers 1-10 to represent a collection	Cleanup Count Routine Number Board (0-10) Sand Paper Numbers Number Books: Writing Numbers 0-10 Slate-Writing Activities Meet the Calculator How Many?		17 23 67 112 115 120 122
K.N.10 Visually determine how many more or less, and then using the verbal counting sequence, match and count 1-10	Eating to Zero Number Board (0-10) “Look and Find” (Numbers 1-10) Egg-Carton Mathematics Spin A Number (1-10) Monster Squeeze Game Children Make Monster Squeeze Game Top It Reading and Comparing Numbers	Match and count	22 23 28 29 80 84 86 170 262
K.N.11 Use and understand verbal ordinal terms, first to tenth	Dismantling the Monthly Calendar Stand, Squat, or Kneel Pattern Ordinal Numbers: Standing in Line		54 163 208

**3.1b: Students will understand meanings of operations and procedures, and how they relate to one another.**

**Operations**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY</b>	<b>PAGE NUMBER</b>
K.N.12 Solve and create addition and subtraction verbal word problems (use counting-based strategies, such as counting on and to ten)	Weather Observation Routine	Count on	24
	Snacking Subtraction	Count to ten	87
	Number Stories Throughout the Year	Solve	90
	One More or One Less		94
	Joining Objects		132
	Change-to-Less (Subtraction Stories)		
	Number Line Mathematics		196
	Pocket Game (Change to More, Change to Less)		198
	Operator, Operator		201
	Which Operation Do I Need?		202
	Class Storybook		209
	Rocker-Balance		228
	Bead String Name Collections		231
	Craft Stick Name Collections		232
Name Collections		282	
Graphing Sums of Dice Throws		296	
K.N.13 Determine sums and differences by various means	Weather Observation Routine	Sum	24
	Number Stories Throughout the Year	Difference	90
	Joining Objects	Take away	132
	Change-to-Less (Subtraction Stories)	Plus	196
	Number Line Mathematics	Minus	198
	Pocket Game (Change to More, Change to Less)	Less	201
	Operator, Operator	How many more?	202
	Which Operation Do I Need?		209
	Introduction to Collections of Number		210
	Names		217
	Disappearing Train		226
	Domino Name Collections		227
	Plus or Minus Game		228
	Class Storybook		230
	Hidden Sticks		232
	Craft-Stick Name Collections		276
	Number Clues		277
	Dice Addition		278
	“What Number Am I Thinking Of?”		279
How Many Hidden Objects?		282	
Rocker Balance Name Collections		296	
Graphing Sums of Dice Throws		297	
High Roller		298	
Number Model Cards			

**3.2: Algebra Strand**

**3.1.c Students will recognize, use, and represent algebraically patterns, relations, and functions.**

**Patterns, Relations, and Functions**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY</b>	<b>PAGE NUMBER</b>
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K.A.1 Use a variety of manipulatives to create patterns using attributes of color, size, or shape	Patterns with Craft Sticks	Patterns	75
	Patterns with Color	Attributes	76
	Follow My Pattern	Same	103
	Weaving on Cardboard Looms	Different	154
	Weaving Belts or Headbands on Straws		156
	How Many Ways for Three People to Line Up?		164
	Macaroni Necklaces		165
K.A.2 Recognize, describe, extend, and create patterns that repeat (i.e., ABABAB or ABAABAAAB)	Counting Patterns	Describe	38
	Patterns All Around	Extend pattern	39
	Beating Out a Time		97
	Class Patterning		102
	Follow My Pattern		103
	Stand, Squat, or Kneel Pattern		163
	“B-I-N-G-O”		183
	Three Object Patterns		187
	Shoe Patterns		188
	Number Grid		222
	“What’s My Rule?” with Pairs of Numbers		248
	“What’s My Rule?” Numbers in Sequence		
	“What’s My Rule?” Numbers Out of Sequence		250
“What’s My Rule?” Large Numbers		252	
		253	

### 3.3: Geometry Strand

3.3a Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.

#### Shapes

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY	PAGE NUMBER
K.G.1 Describe characteristics and relationships of geometric objects	Pattern Blocks	Describe	16
	Singing Game		58
	“Do the Hokey Pokey”		60
	Shapes by Feel		71
	Using Straws to Make Geometry Shapes		73
	Nibble Shapes		78
	“What’s My Rule?” Fishing		99
	Paper-Folding Geometry		105
	Find the Block		106
	Body Shapes		108
	Rope Shapes		110
	Read My Mind Game		166
	Printing Shapes		195
	Comparing Shapes		218
	“I Spy”		220
	Shape Jigsaw Puzzle		269
	Covering Shapes		270
Make and Bake Cookie Shapes		272	
Solid Shapes Museum ( <i>Ongoing Activity</i> )		273	
“What’s My Rule?” with Four-Sided Polygons		274	

3.3b Students will identify and justify geometric relationships, formally and informally.			
Geometric Relationships			
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY	PAGE NUMBER
K.G.2 Sort groups of objects by size and size order (increasing and decreasing)	Partner Match	Sort	12
	Pattern Blocks	Longer	16
	Attribute Blocks	Shorter	37
	“What’s My Rule?” Fishing		99
	Find the Block		106
	Arranging Items by Length		135
	Read My Mind Game		166
	Solid Shapes Museum ( <i>Ongoing Activity</i> )		273

3.3c Students will apply transformations and symmetry to analyze problem solving situations.				
Transformational Geometry				
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY	PAGE NUMBER	
K.G.3 Explore vertical and horizontal orientation of objects	Pattern Blocks	Over	16	
	Singing Game	Under	58	
	“Do the Hokey Pokey”	Above	60	
		Below		
K.G.4 Manipulate two- and three-dimensional shapes to explore symmetry	Pattern Blocks		16	
	Symmetry with Paints		61	
	Symmetry in Nature – Autumn Leaves		62	
	Symmetry Fold-and-Cut Projects			65

3.3d Students will apply coordinate geometry to analyze problem solving situations.			
Coordinate Geometry			
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY	PAGE NOS.
K.G.5 Understand and use ideas such as over, under, above, below, on, beside, next to, and between	Pattern Blocks	Over	16
	“This Old Man”	Under	26
	Singing Game	Above	58
	“Do the Hokey Pokey”	Below	60
		Beside	
		Next to	
	On		

### 3.4: Measurement Strand

3.4a Students will determine what can be measured and how, using appropriate methods and formulas.			
Units of Measurement			
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY	PAGE NUMBER

K.M.1 Name, discuss, and compare attributes of length (longer than, shorter than)	Partner Match	Length	12
	Measuring Heights of Children	Longer than	13
	Building and Measuring in the Block Corner	Shorter than	
	Comparing Lengths		14
	Body Measures of Dinosaurs and Blue Whales		43
	Comparing Body Height to Objects		
	Slow and Fast		92
	Beanbag Game		95
	Arranging Items by Length		96
	Measuring with Children's Feet		98
	How Big Is a Foot?		135
	Need for Standard Measure of Length		136
	Marking Off Lengths		138
	Tools for Measuring Length		146
How Long Does It Take?		148	
Count Heartbeats		150	
		238	
		240	
K.M.2 Compare the length of two objects by representing each length with string or a paper strip	Partner Match	Length	12
	Measuring Heights of Children	Longer than	13
	Building and Measuring in the Block Corner	Shorter than	14
	Arranging Items by Length		
	Measuring with Children's Feet		135
	How Big Is a Foot?		136
	Need for a Standard Measure of Length		138
		146	
K.M.3 Relate specific times such as morning, noon, afternoon, and evening to activities and absence or presence of daylight	Order-of-Daily-Events Art Project	Morning	160
		Noon	
		Afternoon	
		Evening	
		Night	
		Daylight	

### 3.5: Statistics and Probability Strand

#### 3.5a Students will collect, organize, display, and analyze data.

Collection of Data			
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY	PAGE NUMBER
K.S.1 Gather data in response to questions posed by the teacher and students	Clean Up Count Routine		17
	Weather Observation Routine		24
	Building the Monthly Calendar Routine		30
	Birthday Bar Graph		100
	Pets Bar Graph		184
K.S.2 Help to make simple pictographs for quantities up to 10, where one picture represents 1	Number Board (0-10)		23
	Birthday Bar Graph		100
	Pets Bar Graph		184
Organization and Display of Data			
K.S.3 Sort and organize objects by two attributes (i.e., color, size, or shape)	Coins in the Classroom	Sort	15
	How Did You Come To School?	Same/different Attribute	244

K.S.4 Represent data using manipulatives	Number of Day and Growing Number Line		10
	Routine		32
	Age Change		100
	Birthday Bar Graph		161
	Favorite Colors Graph		296
	Graphing Sums of Dice Throws		
<b>Analysis of Data</b>			
K.S.5 Identify more, less, and same amounts from pictographs or concrete models	Building and Measuring in the Block Corner	More	14
	Eating to Zero	Less	22
	Number Board (0-10)	Same	23
	Weather Observation Routine		24
	“Feely” Bag or Box		27
	Age Change		32
	Birthday Bar Graph		100
	Favorite Colors Graph		161
	Pets Bar Graph		184

# Grade 1

## 3.1: Number Sense and Operations

**3.1a: Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.**

Number Systems		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
1.N.1 Count the items in a collection and know the last counting word tells how many items are in the collection (1 to 100)	1.3      2.3 1.4      5.4 8.8	
1.N.2 Count out (produce) a collection of a specified size (10 to 100 items), using groups of ten		K-Counting to 70 by 10s 2 <sup>nd</sup> Grade: 1.1, 1.8, 1.9, 1.11, 7.1 (skip counting)
1.N.3 Quickly see and label with a number, collections of 1 to 10	1.3      1.9 1.4      2.3	
1.N.4 Count by 1's to 100	3.8      5.4 3.9      9.1	
1.N.5 Skip count by 10's to 100	3.3      3.11 3.8      3.12 3.9      9.1	
1.N.6 Skip count by 5's to 50	2.9      3.8 3.2      3.9 3.3      3.11 3.12	
1.N.7 Skip count by 2's to 20	1.11     3.8 2.2      3.9 3.3      9.7	
1.N.8 Verbally count from a number other than one by 1's	1.2      2.1 1.5      3.5 1.11     3.6	
1.N.9 Count backwards from 20 by 1's	2.1	
1.N.10 Draw pictures or other informal symbols to represent a spoken number up to 20	1.2      1.12 1.7      2.2 1.8      5.9	Symbols
1.N.11 Identify that spacing of the same number of objects does not affect the quantity (conservation)	2.3      8.8 2.7      8.9	
1.N.12 Arrange objects in size order (increasing and decreasing)	5.6      7.1 9.6	increasing decreasing
1.N.13 Write numbers to 100	1.4      1.13 1.5      2.3-2.5 1.7      4.10 1.8      9.1 1.11     10.7	
1.N.14 Read the number words one, two, three...ten	1.3	

1.N.15 Explore and use place value	3.3 4.7 4.10 5.1-5.3 5.9	5.12 7.5 8.4 9.8 10.7	
1.N.16 Compare and order whole numbers up to 100	1.6 1.10	3.3 9.1	
1.N.17 Develop an initial understanding of the base ten system: 10 ones = 1 ten 10 tens = 1 hundred	4.7 5.1 5.3 5.9 5.12	6.6 8.2-8.4 8.7 9.8 10.7	
1.N.18 Use a variety of strategies to compose and decompose one-digit numbers	2.3 2.7 4.1 4.2 4.5	4.8 4.9 5.2 6.2 6.3 8.2	compose decompose

1.N.19 Understand the commutative property of addition	2.3 4.2 4.8 4.9 5.4	5.10 6.1 6.3-6.5 6.7 7.2 8.4	commutative property
1.N.20 Name the number before and the number after a given number, and name the number(s) between two given numbers up to 100 (with and without the use of a number line or a hundreds chart)	1.5 1.11 2.3 2.4 3.1	3.5 3.7 3.9 3.10 9.3	
1.N.21 Use before, after, or between to order numbers to 100 (with or without the use of a number line)	1.2 1.6 1.11 3.1	3.5 3.7 9.1 9.3	
1.N.22 Use the words higher, lower, greater, and less to compare two numbers	1.2 1.6 1.10 1.11 2.1 5.3	5.6 5.7 9.1 9.3 9.6 9.7	higher lower greater less
1.N.23 Use and understand verbal ordinal terms, first to twentieth	1.1 1.9		Days of the week during calendar time

**3.1b: Students will understand meanings of operations and procedures, and how they relate to one another.**

**Operations**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY/ • SUGGESTIONS</b>
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1.N.24 Develop and use strategies to solve addition and subtraction word problems	1.13 2.13 3.6 5.7	5.8 8.4 9.4 10.3 10.4	
1.N.25 Represent addition and subtraction word problems and their solutions as number sentences	1.13 2.13 5.7	5.8 8.4 9.4	
1.N.26 Create problem situations that represent a given number sentence	1.13 2.13	5.7 5.8 8.4	
1.N.27 Use a variety of strategies to solve addition and subtraction problems with one- and two-digit numbers without regrouping	2.11-2.13 3.6 3.14 4.1 4.5 4.11 4.12 6.1	6.2 6.4 6.5 6.8 6.11 6.12 8.4 9.4 10.4	
1.N.28 Demonstrate fluency and apply addition and subtraction facts to and including 10	2.11-2.13 3.6 3.14 4.6 4.8 4.9 4.11 4.12 5.7 5.8 5.10 5.11 6.1-6.5	6.7 6.8 6.11 6.12 7.2 8.4 8.5 8.8 8.9 9.2 9.4 10.5 10.6	
1.N.29 Understand that different parts can be added to get the same whole	2.7 2.12 3.12 3.14 4.1 4.2 4.5-4.9 4.11 4.12 5.2	5.4 5.5 5.7-5.10 6.7 7.2 8.6-8.9 9.6-9.8 10.2 10.4 10.5	

**3.1c: Students will compute accurately and make reasonable estimates.**

**Estimation**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY/ • SUGGESTIONS
1.N.30 Estimate the number in a collection to 50 and then compare by counting the actual items in the collection	2.3 3.4 5.4	

### 3.2: Algebra Strand

3.2c Students will recognize, use, and represent algebraically patterns, relations, and functions.		
Patterns, Relations, and Functions		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY/ • SUGGESTIONS
1.A.1 Determine and discuss patterns in arithmetic (what comes next in a repeating pattern, using numbers or objects)	1.9      5.12 3.1-3.5      1.13 3.8-3.11      6.8 3.13      8.6 5.1      9.2-9.4 5.2      9.7 5.10      10.3	repeating patterns

### 3.3: Geometry Strand

3.3a Students will use visualization & spatial reasoning to analyze characteristics & properties of geometric shapes.		
Shapes		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY/ • SUGGESTIONS
1.G.1 Match shapes and parts of shapes to justify congruency	3.4      7.1 4.7      7.5 6.7      7.6 7.1      10.5	congruency
1.G.2 Recognize, name, describe, create, sort, and compare two-dimensional and three-dimensional shapes	1.3      6.7 3.4      7.1-7.6	two-dimensional three-dimensional

3.3c Students will apply transformations and symmetry to analyze problem solving situations.		
Transformational Geometry		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY/ • SUGGESTIONS
1.G.3 Experiment with slides, flips, and turns of two-dimensional shapes	3.4 6.7 7.1	slides flips turns
1.G.4 Identify symmetry in two-dimensional shapes	6.7      7.5 7.1      7.7 9.5	symmetry

3.3d Students will apply coordinate geometry to analyze problem solving situations.		
Coordinate Geometry		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY/ • SUGGESTIONS
1.G.5 Recognize geometric shapes and structures in the environment	4.7      8.1 6.7      9.5 7.1-7.6      10.5	

### 3.4: Measurement Strand

3.4a Students will determine what can be measured and how, using appropriate methods and formulas.		
Units of Measurement		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY/ • SUGGESTIONS
1.M.1 Recognize length as an attribute that can be measured	4.2-4.6    7.3 5.11       8.3 6.6        9.5 6.9        10.1	attribute
1.M.2 Use non-standard units (including finger lengths, paper clips, students' feet and paces) to measure both vertical and horizontal lengths	4.2 4.3 4.6 6.6 6.9	non-standard units
1.M.3 Informally explore the standard unit of measure, inch	2.7 4.3-4.6 7.3 8.3 10.1	standard units

3.4b Students will use units to give meaning to measurements.		
Units of Measurement		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY/ • SUGGESTIONS
1.M.4 Know vocabulary and recognize coins (penny, nickel, dime, quarter)	2.8-2.11    4.3 3.2         6.8-6.10 3.11        7.1 3.12        8.1	
1.M.5 Recognize the cent notation as ¢	2.8-2.11    4.3 3.2         6.9 3.5         6.10 3.11        7.1 8.1	
1.M.6 Use different combinations of coins to make money amounts up to 25 cents	2.8-2.11    5.13 2.13        6.8-6.10 3.12        7.1 4.3         8.1 10.3	
1.M.7 Recognize specific times (morning, noon, afternoon, evening)	2.6         6.10 3.7         6.11	
1.M.8 Tell time to the hour, using both digital and analog clocks	2.5         4.4 2.6         4.8 2.13        4.9 3.7         6.10 3.8         6.11 10.2	
1.M.9 Know the days of the week and months of the year in sequence	1.9 4.9	Calendar routines
1.M.10 Classify months and connect to seasons and other events	1.12 4.1	Calendar routines

3.4d Students will develop strategies for estimating measurements.			
Estimation			
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON		VOCABULARY/ • SUGGESTIONS
1.M.11 Select and use non-standard units to estimate measurements	4.3 4.5	5.4 6.6 6.9	

### 3.5: Statistics and Probability Strand

3.5a Students will collect, organize, display, and analyze data.			
Collection of Data			
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON		VOCABULARY/ • SUGGESTIONS
1.S.1 Pose questions about themselves and their surrounding	1.12 2.2 3.13 4.7	4.9 6.12 7.4 10.1	calendar time weather chart
1.S.2 Collect and record data related to a question	1.7 1.12 2.2 3.13 4.7 4.9	5.9 6.12 7.4 10.1 10.6	calendar time weather chart
Organization and Display of Data			
1.S.3 Display data in simple pictographs for quantities up to 20 with units of one			K-Age Change Birthday Bar Graph and Pets Bar Graph (with pictures) calendar time
1.S.4 Display data in bar graphs using concrete objects with intervals of one	1.9 3.13 4.7	6.12 7.4 10.1	calendar time
1.S.5 Use Venn diagrams to sort and describe data			K-How Did You Come to School? Venn diagrams
Analysis of Data			
1.S.6 Interpret data in terms of the words: most, least, greater than, less than, or equal to	1.7 1.12	3.13 6.12 7.4	calendar time weather chart
1.S.7 Answer simple questions related to data displayed in pictographs (i.e., category with most, how many more in a category compared to another, how many all together in two categories)			K-Age Change Birthday Bar Graph and Pets Bar Graph (with pictures) calendar time routines

**3.5b Students will make predictions that are based upon data analysis.****Predictions from Data**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY/ • SUGGESTIONS</b>
1.S.8 Discuss conclusions and make predictions in terms of the words likely and unlikely	1.8	calendar time routines
1.S.9 Construct a question that can be answered by using information from a graph	1.7 1.8 3.13 10.1	calendar time routines

# Grade 2

## 3.1: Number Sense and Operations

3.1a Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.

### Number Systems

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.N.1 Skip count to 100 by 2's, 5's, 10's	1.11 7.1	Make sure it is to 100
2.N.2 Count back from 100 by 1's, 5's, 10's using a number chart	1.11	Make sure it is to 100 and back
2.N.3 Skip count by 3's to 36 for multiplication readiness	1.1 1.8 6.7	Count by 3 to 36; 4 to 40 – use grid
2.N.4 Skip count by 4's to 48 for multiplication readiness	1.1 1.8 11.6	Count by 3 to 36; 4 to 40 – use grid
2.N.5 Compare and order numbers to 100	1.2 1.12	< (less than) > (greater than) = (equals, equal to)  Add practice through home links
2.N.6 Develop an understanding of the base ten system: 10 ones = 1 ten 10 tens = 1 hundred 10 hundreds = 1 thousand	3.1 3.4 6.5 7.3 10.11	Ones Tens Hundred Thousand
2.N.7 Use a variety of strategies to compose and decompose two-digit numbers	1.9      7.4 3.1-3.2    8.3 3.4-3.5	Decompose Compose
2.N.8 Understand and use the commutative property of addition	1.11 2.4 2.6 2.8-2.9	Commutative property of addition (turn around facts)  Add commutative property
2.N.9 Name the number before and the number after a given number, and name the number(s) between two given numbers up to 100 (with and without the use of a number line or a hundreds chart)	1.3 1.4 7.2 7.8	Before After  Daily during calendar - Daily Before/After
2.N.10 Use and understand verbal ordinal terms		Ordinal numbers First, second.....  Morning Routine
2.N.11 Read written ordinal terms (first through ninth) and use them to represent ordinal relations	1.10 1.11	Third, fourth, fifth, sixth, seventh, eighth,

		ninth Add practice
2.N.12 Use zero as the identity element for addition	1.2 2.2-2.5 2.8	Zero Identity element for addition  • Teach identity element
2.N.13 Recognize the meaning of zero in the place value system (0-100)	1.7 1.9	3.1 3.4-3.5 10.11 Place Value

**Number Theory**

2.N.14 Use concrete materials to justify a number as odd or even		Odd Even
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**3.1b Students will understand meanings of operations and procedures, and how they relate to one another.**

**Operations**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.N.15 Determine sums and differences of number sentences by various means (i.e., families, related facts, inverse operations, addition doubles, and doubles plus one)	2.1 2.2 2.5 2.6 2.7 2.13 12.3	Sum Difference Fact families Inverse operations Addition doubles Doubles plus one
2.N.16 Use a variety of strategies to solve addition and subtraction problems using one- and two-digit numbers with and without regrouping	3.5      6.6 3.6      7.3 4.2      11.1 4.4      11.2	Digit Regrouping
2.N.17 Demonstrate fluency and apply addition and subtraction facts up to and including 18	2.8 2.12 3.5	Fluency
2.N.18 Use doubling to add 2-digit numbers	4.1      7.5 4.6-4.9      11.1 6.1	Doubling
2.N.19 Use compensation to add 2-digit numbers	4.1      4.6-4.9 4.4      6.1	
2.N.20 Develop readiness for multiplication by using repeated addition	2.7      11.5-11.7 6.8-6-10      11.9 11.3      12.4-12.5	
2.N.21 Develop readiness for division by using repeated subtraction, dividing objects into groups (fair share)	6.11 11.4 11.7 11.8	

**3.1c Students will compute accurately and make reasonable estimates.**

**Estimation**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.N.22 Estimate the number in a collection to 100 and then compare by counting the actual items in the collection	4.5 10.5-10.8	Estimate

### 3.2: Algebra Strand

3.2b Students will perform algebraic procedures accurately.

#### Equations and Inequalities

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.A.1 Use the symbols $<$ , $>$ , $=$ (with and without the use of a number line) to compare whole numbers up to 100	1.12 10.4	Whole number $<$ (less than) $>$ (greater than) $=$ (equals, equal to)

3.2c Students will recognize use and represent algebraically patterns relations and functions.

#### Patterns Relations and Functions

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.A.2 Describe and extend increasing or decreasing (+ -) sequences and patterns (numbers or objects up to 100)	2.10 2.11	Sequence Patterns

### 3.3: Geometry Strand

3.3a Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.

#### Shapes

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.G.1 Experiment with slides, flips, and turns to compare two-dimensional shapes	5.1 5.2	Slides (translation) Flips (reflection) Turns (rotation)
2.G.2 Identify and appropriately name two-dimensional shapes: circle, square, rectangle, and triangle (both regular and irregular)	4.3 5.2 5.3 5.5 5.6	Circle Square Rectangle Triangle Regular Irregular
2.G.3 Compose (put together) and decompose (break apart) two-dimensional shapes	5.2-5.6	Two-dimensional shape (2-D)

3.3b Students will identify and justify geometric relationships, formally and informally.

#### Geometric Relationships

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.G.4 Group objects by like properties	5.7 5.8 5.9	Properties  Variation of Attribute Train game

3.3c Students will apply transformations and symmetry to analyze problem solving situations.

#### Transformational Geometry

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.G.5 Explore and predict the outcome of slides, flips, and turns of two-dimensional shapes	5.2 5.3 5.6	
2.G.6 Explore line symmetry	5.9	Symmetry

### 3.4: Measurement Strand

3.4a Students will determine what can be measured and how, using appropriate methods and formulas.		
Units of Measurement		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.M.1 Use non-standard and standard units to measure both vertical and horizontal lengths	7.7 9.5 9.6	Non-standard units Standard units Vertical Horizontal Length
2.M.2 Use a ruler to measure standard units (including whole inches and whole feet)	7.7 9.2 9.3	
2.M.3 Compare and order objects according to the attribute of length	7.7      9.4 9.2      9.9 9.3	Attributes  Extend to compare and order
2. M.4 Recognize mass as a qualitative measure (i.e., Which is heavier? Which is lighter?)	9.1-9.6 9.9 9.10	Mass Heavier Lighter
2.M.5 Compare and order objects, using lighter than and heavier than	9.6 9.7	Light than Heavier than

3.4b Students will use units to give meaning to measurements.		
Units		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.M.6 Know and recognize coins (penny, nickel, dime, quarter) and bills (\$1, \$5, \$10, and \$20)	1.2 1.6 10.2 10.9	Penny    Quarter Nickel    Know Dime    Recognize
2.M.7 Recognize the whole dollar notation as \$1, etc.	1.2 1.6 10.3	Cent notation Dollar notation
2.M.8 Identify equivalent combinations to make one dollar	3.7 3.8 10.1	Combination Equivalent  EM Coin Cards Up to \$1
2.M.9 Tell time to the half hour and five minutes using both digital and analog clocks	3.3 12.1 12.2	Half-hour Digital Analog Clock Concentration

3.4d Students will develop strategies for estimating measurements.		
Estimation		
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS
2.M.10 Select and use standard (customary) and non-standard units to estimate measurements	9.1-9.10	Standard units Customary units Non-standard units

### 3.5: Statistics and Probability Strand

#### 3.5a Students will collect, organize, display, and analyze data.

##### Collection of Data

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / SUGGESTIONS
2.S.1 Formulate questions about themselves and their surroundings		Formulate Calendar routines
2.S.2 Collect and record data (using tallies) related to the question	1.5 6.2 6.3	Collect Record Data Tally (tallies) Calendar routines

##### Organization and Display of Data

2.S.3 Display data in pictographs and bar graphs using concrete objects or a representation of the object	1.5 6.3 12.6 12.7	Pictographs Bar graph Representation
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##### Analysis of Data

2.S.4 Compare and interpret data in terms of describing quantity (similarity or differences)	6.2 6.4 12.6 12.7	Compare    Difference Interpret    Quantity Data        Similarity Extend lesson
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#### 3.5b Students will make predictions that are based upon data analysis.

##### Predictions from Data

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / SUGGESTIONS
2.S.5 Discuss conclusions and make predictions from graphs	7.9 12.6 12.7	Conclusion Prediction

# Grade 3

## 3.1: Number Sense and Operations

**3.1a Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
3.N.1 Skip count by 25's, 50's, 100's to 1,000	1.2      5.4 1.8-1.9      5.8 2.2-2.3      5.12 3.2      7.8 4.5      8.1 4.9      9.5 5.1      10.10 11.9	• Count by 25's, 50's & 100, 1000's	*	
3.N.2 Read and write whole numbers to 1,000	1.2      5.1-5.4 1.8      6.6 2.5      6.12 4.2-4.3	Whole number	*	
3.N.3 Compare and order numbers to 1,000	1.2      7.3 1.9      7.9 1.10      8.2 2.2      8.5-8.7 2.8      10.5 3.6      10.7-10.8 5.2-5.5      10.10 5.7-5.10      11.2-11.3 6.6 (includes decimals)		*	
3.N.4 Understand the place value structure of the base ten number system: 10 ones = 1 ten ; 10 tens = 1 hundred ; 10 hundreds = 1 thousand	1.2 1.6 1.8 1.10-1.12 2.1 2.3 2.7 3.3 4.1 4.6 All of 5 6.1-6.4 6.6-6.7	6.10 6.12 7.1-7.3 7.5-7.7 7.9 8.1-8.3 8.6 9.2 9.4-9.9 9.12 10.2 11.1-11.2 11.4-11.5 11.8	Ones Tens Hundreds Thousands Ten thousands Hundred thousands Millions	*
3.N.5 Use a variety of strategies to compose and decompose three-digit numbers	1.8 1.11 2.1-2.2 7.7 8.1-8.2 8.4-8.5 9.5-9.13	10.1-3 10.5 10.7 11.1 11.3 11.5 11.7-11.9		*

3.N.6 Use and explain the commutative property of addition and multiplication	2.1 2.6 2.8	3.6-3.8 4.6	Commutative (turn-around facts)  • Use and explain commutative property in these lessons • Practice with routines • See Teacher's Reference Manual	*
3.N.7 Use 1 as the identity element for multiplication	7.3	Add to: 4.5-4.6	Identity element of multiplication  • Use and explain vocabulary/concept when teaching 1 tables • See Teacher's Reference Manual	*
3.N.8 Use the zero property of multiplication	7.3	Add to: 4.5-4.6	Zero property of multiplication	*
3.N.9 Understand and use the associative property of addition	3.1-3.3 3.5 4.1	4.8 Add to: 5.12	Associative property of addition  • Use and explain associative property of addition • See Teacher's Reference Manual	*
3.N.10 Develop an understanding of fractions as part of a whole unit and as parts of a collection	5.3 5.7 8.1-8.7 9.1-9.12	10.1- 10.7 10.9- 10.10 11.3- 11.5 11.9	• Fraction Top It	*

3.N.11 Use manipulatives, visual models, and illustrations to name and represent unit fractions ( $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}$ and $\frac{1}{10}$ ) as part of a whole or a set of objects	5.3 5.7 8.1-8.7 9.1-9.8 9.11-9.13	10.1-10.7 10.9- 10.10 11.3-11.5 11.9	• Fraction Top It	*	
3.N.12 Understand and recognize the meaning of numerator and denominator in the symbolic form of a fraction	5.3 5.7 8.1-8.7 9.1-9.13	10.1-10.7 10.9- 10.10 11.3-11.5 11.9	Numerator Denominator  • See Teacher's Reference Manual	*	
3.N.13 Recognize fractional numbers as equal parts of a whole	5.3 5.7 8.1-8.8 9.1-9.8 9.11-9.13	10.1-10.7 10.9- 10.10 11.3-11.5 11.9	• Fraction Top It	*	
3.N.14 Explore equivalent fractions ( $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ )	5.7 6.5 8.4-8.7 9.3 9.7 9.13	10.2-10.3 10.6 10.9 11.1 11.3-11.5 11.7	Equivalent fractions  • Use Fraction Cards • Play Fraction Top It • See Teacher's Reference Manual		*
3.N.15 Compare & order unit fractions ( $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ ) & find their approx. locations on a number line	5.7 5.9 8.3-8.7 9.2 9.4 9.7-9.8 9.10-9.11	10.3 10.4 10.8 10.10 11.2-11.4 11.6			*
<b>Number Theory</b>					
3.N.16 Identify odd and even numbers	Add to: 4.2	10.3 10.9	Odd Even	*	
3.N.17 Develop an understanding of the properties of odd/even numbers as a result of addition or subtraction	Teacher could make additional problems like those in: 10.3 10.9		1 <sup>st</sup> Grade Lessons: 3.2, 3.13 2 <sup>nd</sup> Grade Lessons: 1.13, 2.1 Boxes; 4.3	*	

**3.1b Students will understand meanings of operations and procedures, and how they relate to one another.**

**Operations**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
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3.N.18 Use a variety of strategies to add and subtract 3-digit numbers (with and without regrouping)	3.2-3.8 4.1-4.2 4.4-4.5 4.7-4.8 5.6	5.10 5.12 6.3 7.1 7.3-7.4 7.7	Strategy Digit Regrouping (same as trade first)	*	
3.N.19 Develop fluency with single-digit multiplication facts	4.2-4.3 4.5-4.9 5.1-5.9 5.11-5.12 6.1-6.2 6.6 6.8-6.10 6.12	7.1-7.9 8.1-8.2 8.3-8.7 9.1-9.13 10.1- 10.11 11.1- 11.9	Fluency  • Use fact triangles • Fact Triangle Flip • Fact of the Day • Multiplication Bingo • Multiplication Top It • Multiplication Baseball		<b>Assess Post-March for above 5 x 10. In context</b>
3.N.20 Use a variety of strategies to solve multiplication problems with factors up to 12 x 12	4.1-4.9 5.1-5.12 6.2 6.6 6.8-6.10 6.12 7.1-7.9	8.1-8.2 8.4 8.7 9.1-9.13 10.1- 10.11 11.1- 11.9	Solve  • Use fact triangles • Fact Triangle Flip • Use arrays • Fact extensions • 3-factors Multiplication Baseball		*
3.N.21 Use the area model, tables, patterns, arrays, and doubling to provide meaning for multiplication	1.7-1.8 1.11 3.6-3.8 4.1-4.9 5.1-5.9 5.11-5.12 6.2-6.4 6.6 6.8	6.10 6.12 7.1-7.9 8.2 9.1-9.13 10.2 10.5- 10.6 11.6- 11.9	Area model Tables Patterns Arrays Doubling	*	
3.N.22 Demonstrate fluency and apply single-digit division facts	4.3 4.5-4.9 5.1-5.2 5.4-5.6 5.9 6.1-6.2 6.6-6.9 6.11-6.12	7.1-7.6 8.4 9.1-9.13 10.3 10.5 10.10 11.4 11.6- 11.9	• Practice through fact triangles practice • Division Array		<b>Assess Post-March for above 50 divided by 10 and grade 3 for below 50 divided by 10. In context</b>

3.N.23 Use tables, patterns, halving, and manipulatives to provide meaning for division	1.5 1.7-1.8 1.11 4.1-4.9 5.1 5.4-5.5 5.9 6.1-6.3 6.6 6-8-6.9	6.11-6.12 7.4-7.6 8.4 9.1-9.13 10.3 10.5 11.4 11.6-11.9	Tables Patterns Halving Manipulative  • What's My Rule • Frames and Arrows • Multiplication/ division grid		*
3.N.24 Develop strategies for selecting the appropriate computational and operational method in problem solving situations. Students will compute accurately and make reasonable estimates.	2.2 2.5 2.7-2.9 3.1-3.8 4.1-4.9 5.1-5.8 5.10 5.12 6.2-6.3	6.8-6.9 7.1 7.3-7.7 7.9 8.1-8.7 9.1-9.13 10.1-10.11 11.1 11.3-11.9	Estimate  • Practiced throughout • What's My Rule • Frames and Arrows • Mental Math and Math messages • Minute Math Book	*	

**3.1c Students will compute accurately and make reasonable estimates.**

Estimation					
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON		VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
3.N.25 Estimate numbers up to 500	1.10 2.7-2.9 3.1 3.3-3.6 5.1 5.4-5.5 5.11 6.1 6.3 6.7 6.11 7.1	7.7-7.9 8.1 8.4-8.6 9.1-9.3 9.5 9.9 9.12 10.1 10.4 11.2 11.6-11.7 11.9	Estimate  • Guessing Jars	For numbers 0-199	For numbers past 200
3.N.26 Recognize real world situations in which an estimate (rounding) is more appropriate	1.10 5.4-5.5 6.3 6.11	7.7-7.8 8.6 9.1-9.3	Rounding		*
3.N.27 Check reasonableness of an answer by using estimation	1.10 3.3-3.6 5.1 5.4-5.5 5.11 6.1 6.3 6.11	8.4-8.6 9.1-9.3 9.5 9.9 9.12 10.1 10.4 11.2	Reasonableness	*	

	7.1 7.7-7.9 8.1	11.6-11.7 11.9		
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### 3.2: Algebra Strand

3.2b Students will recognize use and represent algebraically patterns relation sand functions.

#### Equations and Inequalities

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / SUGGESTIONS	Pre March Instruction	Post March Instruction
3.A.1 Use the symbols $<$ , $>$ , $=$ (with and without the use of a number line) to compare whole numbers and unit fractions ( $\frac{1}{2}$ , $\frac{1}{3}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{1}{6}$ and $\frac{1}{10}$ ),	1.9-1.10 2.3 2.5 3.1 3.4 3.7 4.1 4.4 5.3	5.11 6.1 6.5 8.3-8.7 9.13 10.7-10.8 11.1 11.5		Post-March for fractions
3.A.2 Describe and extend numeric (+/-) and geometric patterns	1.6 1.11 1.12 2.3	2.6 5.1 7.1 9.1	* •Frames & Arrows •Number grid puzzles •Templates for geometric patterns	

### 3.3: Geometry Strand

Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.

#### Shapes

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / SUGGESTIONS	Pre March Instruction	Post March Instruction
3.G.1 Define and use correct terminology when referring to shapes (circle, triangle, square, rectangle, rhombus, trapezoid, and hexagon)	3.4-3.5 4.8 5.6 6.1-6.12 7.2 7.4	7.6 7.9 9.1 9.10-9.11 10.4	* Circle Triangle Square Kite Rhombus Trapezoid Hexagon Quadrangle Parallelogram Adjacent side Rectangle	
3.G.2 Identify congruent and similar figures	Explor. 6.10 6.11	Explor. 7.9 10.8		*
3.G.3 Name, describe, compare, and sort three-dimensional shapes: cube, cylinder, sphere, prism, and cone	6.11-6.12 7.1 7.3 7.5 7.7	8.1 9.5 10.2-10.3 10.6 10.8	* Cube Cylinder Sphere Prism Cone Sphere Pyramid Polyhedron Face Edge Vertex Base Parallel	

		Face Three dimensional Two dimensional	*	
3.G.4 Identify the faces on a three-dimensional shape as two-dimensional shapes	6.11-6.12 7.1 7.3			

**Students will apply transformations and symmetry to analyze problem solving situations.**

**Transformational Geometry**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
3.G.5 Identify and construct lines of symmetry	6.9.6.12 7.6 7.2 9.1	Symmetry	*	

**3.4: Measurement Strand**

**Students will determine what can be measured and how, using appropriate methods and formulas.**

**Units of Measurement**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
3.M.1 Select tools and units (customary) appropriate for the length measured	1.4 8.3-8.4 3.1-3.8 8.7 4.1-4.9 9.3 5.3-5.4 9.7 5.6 9.12-9.13 5.9-5.10 10.1-10.2 6.1 10.4 6.4-6.7 10.8 6.9 10.10 6.11 11.2		*	
3.M.2 Use a ruler/yardstick to measure to the nearest standard unit (whole and ½ inches, whole feet, and whole yards)	1.4 8.7 3.2-3.5 9.2-9.3 3.6-3.8 9.7 4.1-4.9 9.12 5.3-5.4 10.1-10.2 5.11-5.12 10.4 6.4-6.7 10.6 6.9 10.8 6.11 10.10 8.3-8.4 11.2		*	
3.M.3 Measure objects, using ounces and pounds	10.1 10.11 10.3-10.7 11.2 10.9		*	

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
3.M.4 Recognize capacity as an attribute that can be measured	10.1 10.4-10.9 10.11 11.2	Capacity Attribute	*	
3.M.5 Compare capacities (i.e., Which contains more? Which contains less?)	10.1 10.4-10.6 10.9		*	
3.M.6 Measure capacity, using cups, pints, quarts, and gallons	10.1      10.11 10.4-10.8      11.2	Cup Pint Quart Gallon	*	

**Students will use units to give meaning to measurements.**

**Units**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
3.M.7 Count and represent combined coins and dollars, using currency symbols (\$0.00)	1.6      5.3 1.8-1.11      5.7-5.8 2.1-2.3      6.3 2.6-2.7      6.5 3.1      9.3 3.5      9.5-9.8 3.7-3.8      9.10 4.1      9.12 4.5-4.8      10.3	Currency	*	
3.M.8 Relate unit fractions to the face of the clock: Whole = 60 minutes $\frac{1}{2}$ = 30 minutes $\frac{1}{4}$ = 15 minutes	6.8      Add to chapters 8-10		*	

**3.5a Students will collect, organize, display, and analyze data.**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS					
Collection of Data					
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON		VOCABULARY// • SUGGESTIONS	Pre March Instruction	Post March Instruction
3.M.9 Tell time to the minute, using digital and analog clocks themselves and their surroundings	1.1 1.4-1.7	3.5 4.3	Digital Data Analog Observation		*
3.S.2 Collect data using observation and surveys, and record appropriately	1.9 1.11 1.16 2.6	4.5 5.12 7.2 11.7-11.9	• Students complete top of each	*	*
<b>Organization and Display of Data</b>					
3.S.3 Construct a frequency table to represent a collection of data	2.4.5 2.9.10	10.11.2 11.8	Frequency table • Clock	*	
3.S.4 Identify the parts of pictographs and bar graphs	1.5	10.10	Pictograph Bar graph		
3.M.10 Select and use standard (customary) and non-standard units to estimate measurements	3.1.8.3 4.9.4 10.7-10.8	10.11.2 10.4-10.6	Bar graph Non-standard unit Standard unit Customary unit	*	
3.S.5 Display data in pictographs and bar graphs	1.5 1.8 3.1 6.5	10.4 10.7- 10.8 10.10	• extend Find the Difference	*	
	8.6 9.13	11.2 11.8- 11.9			
3.S.6 State the relationships between pictographs and bar graphs	1.5		6 <sup>th</sup> Grade Lesson: 1.10	*	
<b>Analysis of Data</b>					
3.S.7 Read and interpret data in bar graphs and pictographs	1.5-1.6 1.12 2.5-2.6 5.4 5.9	6.2 6.5 6.10 9.1 9.3 11.9		*	

**3.5: Statistics and Probability Strand**

**3.5b Students will make predictions that are based upon data analysis.**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS					
Predictions from Data					
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON		VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
3.S.8 Formulate conclusions and make predictions from graphs	1.5	2.6	Conclusions Predictions	*	

**Grade 4**

**3.1: Number Sense and Operations**

3.1a Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.	
Number Systems	

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
4.N.2 Read and write whole numbers to 10,000	2.3-2.4 5.3-5.4 5.7-5.11		*	
4.N.3 Compare and order numbers to 10,000	5.7-5.8 5.10-5.11	•Number Top It	*	
4.N.4 Understand the place value structure of the base ten number system: 10 ones = 1 ten 10 tens = 1 hundred 10 hundreds = 1 thousand 10 thousands = 1 ten thousand	2.4 2.7 4.10 5.7-5.11		*	
4.N.5 Recognize equivalent representations for numbers up to four digits and generate them by decomposing and composing numbers	2.2 2.7-2.9 5.10	Composing Decomposing	*	
4.N.6 Understand, use, and explain the associative property of multiplication	3.9-3.10	Associative property of multiplication	*	
4.N.7 Develop an understanding of fractions as locations on number lines and as divisions of whole numbers	7.1-7.5 7.9 7.11			*
4.N.8 Recognize and generate equivalent fractions (halves, fourths, thirds, fifths, sixths, and tenths) using manipulatives, visual models, and illustrations	7.6-7.8	Halves Fourths Thirds	Fifths Sixths Tenths	*
		•Everyday Math Cards		
4.N.9 Use concrete materials and visual models to compare and order unit fractions or fractions with the same denominator (with and without the use of a number line)	7.1-7.5 7.9-7.10 7.12	•Everyday Math Cards •Pattern blocks •Geoboards		*
4.N.10 Develop an understanding of decimals as part of a whole	4.1-4.3 4.9-4.10 9.1-9.3	•Money •Coin Cards		*
4.N.11 Read and write decimals to hundredths, using money as a context	4.1-4.6 4.10 5.2	Hundredth  •Money •Coin Cards		*
4.N.12 Use concrete materials and visual models to compare and order decimals (less than 1) to the hundredths place in the context of money	4.5 4.9-4.10	•Base 10 blocks •Decimal Top It		*

**Number System**

4.N.13 Develop an understanding of the properties of odd/even numbers as a result of multiplication	3.4-3.6 3.9		*	
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**3.1b Students will understand meanings of operations and procedures, and how they relate to one another.**

**Operations**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
4.N.14 Use a variety of strategies to add and subtract numbers up to 10,000	1.2-1.5    2.9 2.1-2.3    3.5 2.5        3.7 2.7		*	
4.N.15 Select appropriate computational and operational methods to solve problems	2.2-2.3    4.1 2.7        4.5 2.9        5.5 3.4-3.7    6.1-6.3 3.9-3.11		*	
4.N.16 Understand various meanings of multiplication and division	3.1-3.6 3.9		*	
4.N.17 Use multiplication and division as inverse operations to solve problems	3.1 3.4-3.6 3.9	Inverse Operation  •Frames & Arrows •“What’s My Rule?”	*	
4.N.18 Use a variety of strategies to multiply two-digit numbers by one-digit number (with and without regrouping)	4.2        6.1 5.1-5.2    6.3 5.5-5.7    9.2 5.9		*	
4.N.19 Use a variety of strategies to multiply two-digit numbers by two-digit numbers (with and without regrouping)	5.5-5.7 5.9 6.1 6.3 9.2			*
4.N.20 Develop fluency in multiplying and dividing multiples of 10 and 100 up to 1,000	5.1-5.2 6.1 6.3	•Baseball multiplication •Fact extension version	*	
4.N.21 Use a variety of strategies to divide two-digit dividends by one-digit divisors (with and without remainders)	3.4-3.6 3.9 6.1 6.3-6.5 7.6	•Division Array	*	
4.N.22 Interpret the meaning of remainders	6.4		*	
4.N.23 Add and subtract proper fractions with common denominators	7.4-7.5	•Everyday Math cards		*
4.N.24 Express decimals as	4.1        7.8	•Percent/Decimal/Fraction		*

an equivalent form of fractions to tenths and hundredths	4.4 4.6	9.1-9.3 9.6 9.8-9.9	Concentration		
4.N.25 Add and subtract decimals to tenths and hundredths using a ( <i>blank?</i> ) hundreds chart	4.4-4.5				*

**3.1c Students will compute accurately and make reasonable estimates.**

**Estimation**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
4.N.26 Round numbers less than 1,000 to the nearest tens and hundreds	5.3-5.4 5.10	• Slates	*	
4.N.27 Check reasonableness of an answer by using estimation	3.6 4.3	4.8 53.-5.4	*	

**3.2: Algebra Strand**

**3.2 a Students will represent and analyze algebraically a wide variety of problem solving situations.**

**Variables and Expressions**

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
4.A.1 Evaluate and express relationships using open sentences with one operation	3.9-3.10	• “What’s My Rule?” • Frames & Arrows • Name that Number	*	
4.A.2 Use the symbols $<$ , $>$ , $=$ , and $\neq$ (with and without the use of a number line) to compare whole numbers and unit fractions and decimals (up to hundredths)	3.10 4.2	• Add $\neq$ • Top-It • Fraction/ Percent Concentration		*
4.A.3 Find the value or values that will make an open sentence true, if it contains $<$ or $>$	3.8-3.10		*	

**3.2c Students will recognize use and represent algebraically patterns relation sand functions.**

**Patterns Relations and Functions**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
4.A.4 Describe extend and make generalizations about numeric ( $\div \times - +$ ) and geometric patterns	3.1 3.9 5.2 5.4		*	
4.A.5 Analyze a pattern or a whole-number function and state the rule given a table or an input/output box	Math Boxes from Lessons: 3.5-3.8, 3.10	<ul style="list-style-type: none"> <li>• "What's My Rule?"</li> <li>• Frames and Arrows</li> </ul> 3 <sup>rd</sup> Grade Lessons: 2.1, 2.3-2.4, 3.8	*	

**3.3: Geometry Strand**

**3.3a Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.**

**Shapes**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
4.G.1 Identify and name polygons, recognizing that their names are related to the number of sides and angles (triangle, quadrilateral, pentagon, hexagon, and octagon)	1.2-1.8	Triangle Quadrilateral Pentagon Hexagon Octagon  • Geometry poster	*	
4.G.2 Identify points and line segments when drawing a plane figure	1.2-1.4 1.8	Point Line	*	
4.G.3 Find perimeter of polygons by adding sides	8.1-8.2 8.7	Perimeter	*	
4.G.4 Find the area of a rectangle by counting the number of squares needed to cover the rectangle	8.3-8.7	Area	*	
4.G.5 Define and identify vertices, faces, and edges of three-dimensional shapes	8.5	Vertices Faces Edges Three-dimensional shapes	*	

**3.3b Students will identify and justify geometric relationships, formally and informally.**

**Geometric Relationships**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
4.G.6 Draw and identify intersecting, perpendicular, and parallel lines	1.2-1.4 1.8	Intersecting Perpendicular Parallel lines		*

4.G.7 Identify points and rays when drawing angles	1.2-1.4 1.8			*
4.G.8 Classify angles as acute, obtuse, right, and straight	1.2-1.5 1.8 6.8	Acute Obtuse Right Straight		*

### 3.4: Measurement Strand

**3.4a Students will determine what can be measured and how, using appropriate methods and formulas.**

#### Units of Measurement

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
4.M.1 Select tools and units (customary and metric) appropriate for the length being measured	2.8      5.1 4.7      5.5 4.9		*	
4.M.2 Use a ruler to measure to the nearest standard unit (whole, ½ and ¼ inches, whole feet, whole yards, whole centimeters, and whole meters)	2.8 4.7 4.9 5.1		*	
4.M.3 Know and understand equivalent standard units of length: 12 inches = 1 foot 3 feet = 1 yard	8.1 Math Boxes: 7.13	• “What’s My Rule?” • Name Collection Box  3 <sup>rd</sup> Grade Lessons: 3.3, 10.1	*	
4.M.4 Select tools and units appropriate to the mass of the object being measured (grams and kilograms)	8.1 11.1 11.7		*	
4.M.5 Measure mass, using grams	11.1 11.7		*	
4.M.6 Select tools and units appropriate to the capacity being measured (milliliters and liters)	11.7	3 <sup>rd</sup> Grade Lesson: 10.6 5 <sup>th</sup> Grade Lessons: 9.10, 11.6	*	
4.M.7 Measure capacity, using milliliters and liters		3 <sup>rd</sup> Grade Lesson: 10.6 5 <sup>th</sup> Grade Lessons: 9.10, 11.6	*	

**3.4b Students will use units to give meaning to measurements.**

#### Units

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
4.M.8 Make change, using combined coins and dollar amounts	4.5	3 <sup>rd</sup> Grade Lessons: 1.9, 1.10, 2.5	*	
4.M.9 Calculate elapsed time in hours and half hours,	3.8		*	

not crossing A.M./P.M.				
4.M.10 Calculate elapsed time in days and weeks, using a calendar	5.3	3 <sup>rd</sup> Grade Lessons: 1.2, 11.8, Project 4	*	

### 3.5: Statistics and Probability Strand

#### 3.5a Students will collect, organize, display, and analyze data.

##### Collection of Data

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
4.S.1 Design investigations to address a question from given data	2.5-2.6 2.8 3.6	9.6 12.1		*
4.S.2 Collect data using observations, surveys, and experiments and record appropriately	2.5-2.6 2.8 3.3	9.6 12.1 12.4 12.5		*

##### Organization and Display of Data

4.S.3 Represent data using tables, bar graphs, and pictographs	2.5-2.6 2.8 8.8	9.6-9.7 12.1	*	
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##### Analysis of Data

4.S.4 Read and interpret line graphs	2.5-2.6 3.3 8.6 12.1			*
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#### 3.5b Students will make predictions that are based upon data analysis.

##### Predictions from Data

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
4.S.5 Develop and make predictions that are based on data	2.5-2.6 2.8 3.6 3.11 8.8	9.7 11.4 12.1- 12.5	*	
4.S.6 Formulate conclusions and make predictions from graphs	2.5-2.6 2.8 3.6 3.11 7.7	9.6-9.7 10.2 11.4 12.1 12.6	*	

# Grade 5

## 3.1: Number Sense and Operations

**3.1a Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.**

### Number Systems

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
5.N.1 Read and write whole numbers to millions	2.2-2.3      7.2-7.3 2.10          8.6 3.1-3.2      9.2		*	
5.N.2 Compare and order numbers to millions	2.10		*	
5.N.3 Understand the place value structure of the base ten number system 10 ones = 1 ten 10 tens = 1 hundred 10 hundreds = 1 thousand 10 thousands = 1 ten thousand 10 ten thousands = 1 hundred thousand 10 hundred thousands = 1 million	2.2-2.3 2.10 3.1-3.2 4.1 6.6 7.2-7.3	Ones Tens Hundreds Thousand Ten thousand Hundred Thousand Million	*	
5.N.4 Create equivalent fractions, given a fraction	2.6          6.8 5.3-5.4      8.1	Equivalent	*	
5.N.5 Compare and order fractions including unlike denominators (with and without the use of a number line) Note: Commonly used fractions such as those that might be indicated on ruler, measuring cup, etc.	2.5 5.1-5.3 8.1-8.2 8.5 8.12	Numerator Denominator  • Fraction Top It	*	
5.N.6 Understand the concept of ratio	12.1-12.5 12.6-12.8	Ratio  • Student Reference Book pg. 96-106	*	
5.N.7 Express ratios in different forms	12.3-12.4		*	
5.N.8 Read, write, and order decimals to thousandths	2.2-2.3 5.5 6.5 6.8 6.10	Tenths Hundredths Thousandths	*	
5.N.9 Compare fractions using <, >, or =	5.3 6.1 8.5	< (less than) > (greater than) - (equals, equal to)	*	
5.N.10 Compare decimals using <, >, or =	4.1      5.7 5.11     7.55	Use decimal	*	

5.N.11 Understand that percent means part of 100, and write percents as fractions and decimals	2.6 4.1-4.2 5.5-5.6 5.8 6.5	6.8 6.10 8.8 8.10 9.5 12.2	Percent Percentage Fraction Decimal	*	
<b>Number Theory</b>					
5.N.12 Recognize that some numbers are only divisible by one and themselves (prime) and others have multiple divisors (composite)	1.1 1.6 1.9 12.1		Composite, prime, divisors  Factor Captor	*	
5.N.13 Calculate multiples of a whole number and the least common multiple of two numbers	12.1		Student Reference Book pg 64 & 65	*	
5.N.14 Identify the factors of a given number	1.1 1.3-1.6 1.9	5.4 12.1		*	
5.N.15 Find the common factors and the greatest common factor of two numbers	12.1		Student Reference Book pg 236	*	

**3.1b Students will understand meanings of operations and procedures, and how they relate to one another.**

**Operations**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
5.N.16 Use a variety of strategies to multiply three-digit by three-digit numbers Note: Multiplication by anything greater than a three-digit multiplier/ multiplicand should be done using technology.	2.8-2.9	Multiplicand  •Lattice •Multiplication Wrestling (partial products)	*	
5.N.17 Use a variety of strategies to divide three-digit numbers by one- and two-digit numbers Note: Division by anything greater than a two-digit divisor should be done using technology.	1.1 1.5 4.1-4.2 4.4-4.5 5.10	Divisor  •Division Dash •Division Top It	*	
5.N.18 Evaluate an arithmetic expression using order of operations including multiplication, division, addition, subtraction and parentheses	7.4-7.6 8.7 10.2 12.4	Expression Operation	*	
5.N.19 Simplify fractions to lowest terms	5.1-5.3 6.1	8.5-8.6 9.6	Simplify Lowest term	*
5.N.20 Convert improper	5.2-5.3		Improper Fraction	*

fractions to mixed numbers, and mixed numbers to improper fractions	8.6 8.8			
5.N.21 Use a variety of strategies to add and subtract fractions with like denominators	5.3 6.8-6.10 7.1 8.2	8.11 9.6 10.6	Mixed Number Like denominator  •SRB pg. 65, 68	*
5.N.22 Add and subtract mixed numbers with like denominators	8.2-8.4 8.11 9.6 10.6		•SRB pg. 70-72	*
5.N.23 Use a variety of strategies to add, subtract, multiply, and divide decimals to thousandths	2.2-2.3 2.8 2.10		4.4 7.8 10.3	•  *

### 3.1c Students will compute accurately and make reasonable estimates

#### Estimation

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
5.N.24 Round numbers to the nearest hundredth and up to 10,000	2.7 4.1	•SRB pg 45-46	*	
5.N.25 Estimate sums and differences of fractions with like denominators	9.7		*	
5.N.26 Estimate sums differences, products, and quotients of decimals		2.2-2.3 2.7-2.9 4.4-4.5	*	
5.N.27 Justify the reasonableness of answers using estimation	2.1 2.5 2.7-2.8 2.10	4.5 8.11 9.7 10.3	*	

## 3.2: Algebra Strand

### 3.2a Students will represent and analyze algebraically a wide variety of problem solving situations

#### Variables and Expressions

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
5.A.1 Define and use appropriate terminology when referring to constants, variables, and algebraic expressions	4.6	Inverse operation Variable Algebraic expression Constants	*	
5.A.2 Translate simple verbal expressions into algebraic expressions	2.4 2.7 4.5-4.6	10.1 10.3 10.7		*

### 3.2b Students will perform algebraic procedures accurately.

#### Variables and Expressions

NEW YORK STATE	UNIT/LESSON	VOCABULARY /	Pre March	Post March
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<b>LEARNING STANDARDS FOR MATHEMATICS</b>		<b>• SUGGESTIONS</b>	<b>Instruction</b>	<b>Instruction</b>
5.A.3 Substitute assigned values into variable expressions and evaluate using order of operations	2.3-2.4 4.6 7.5 8.7 9.6-9.7 10.1	Substitute Order of Operation		*
<b>Equations and Inequalities</b>				
<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
5.A.4 Solve simple one-step equations using basic whole-number facts	2.2 2.4 3.3 4.6	One-step equations		*
5.A.5 Solve & explain simple one-step equations using inverse operations involving whole Nos.	8.10 10.3	Inverse  • Use Frames & Arrows • Use “What’s My Rule?”		*
5.A.6 Evaluate the perimeter formula for given input values	10.8 Math Boxes:2.6, 2.9, 7.3, 7.11, 10.3, 10.10	Perimeter Formula  4 <sup>th</sup> Grade Lessons 8.1-8.2  The focus of using an algebraic formula is only in 6 <sup>th</sup> grade lessons: 1.9, 9.8-9.9, 9.11	*	

**3.2c Students will recognize, use, and represent algebraically patterns, relations, and functions.**

**Patterns, Functions, and Relations**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
5.A.7 Create and explain patterns and algebraic relationships (i.e.,2,4,6,8...) algebraically: $2n$ (doubling)	1.7-1.9 8.3 10.3-10.5	Algebraic Algebraically  • Use Frames & Arrows • Use “What’s My Rule?”	*	
5.A.8 Create algebraic or geometric patterns using concrete objects or visual drawings (i.e., rotate and shade geometric shapes)	3.8 3.10 10.2 10.5	Geometric Rotate Flip Turn	*	

**3.3: Geometry Strand**

**3.3a Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.**

**Shapes**

<b>NEW YORK STATE</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY /</b>	<b>Pre</b>	<b>Post March</b>
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<b>LEARNING STANDARDS FOR MATHEMATICS</b>		<b>• SUGGESTIONS</b>	<b>March Instruction</b>	<b>Instruction</b>
5.G.1 Calculate the perimeter of regular and irregular polygons	1.1 3.6	Irregular polygon	*	

**3.3b Students will identify and justify geometric relationships, formally and informally.**

<b>Geometric Relationships</b>				
<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
5.G.2 Identify pairs of similar triangles	3.6	Similar  SRB Glossary	*	
5.G.3 Identify the ratio of corresponding sides of similar triangles		Corresponding sides  6 <sup>th</sup> Grade Lessons: 8.9, 8.11-8.12 (other shapes) 8.10	*	
5.G.4 Classify quadrilaterals by properties of their angles and sides	3.4-35 3.7 9.4	Angle Side Property	*	
5.G.5 Know that the sum of the interior angles of a quadrilateral is 360 degrees	3.3 3.6 3.9	Interior angle	*	
5.G.6 Classify triangles by properties of their angles and sides	1.1 3.6 4.6 6.9		*	
5.G.7 Know that the sum of the interior angles of a triangle is 180 degrees	3.9		*	
5.G.8 Find a missing angle when given two angles of a triangle	3.9 4.6		*	
5.G.9 Identify pairs of congruent triangles	3.6	Congruent	*	
5.G.10 Identify corresponding parts of congruent triangles	3.6	Corresponding parts	*	

**3.3c Students will apply transformations and symmetry to analyze problem solving situations**

<b>Transformational Geometry</b>				
<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
5.G.11 Identify and draw lines of symmetry of basic geometric shapes	Math Boxes: 8.1, 8.3, 8.13	Symmetry  4 <sup>th</sup> Grade Lesson: 10.4 Project 4	*	

**3.3d Students will apply coordinate geometry to analyze problem solving situations.**

**Coordinate Geometry**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
5.G.12 Identify and plot points in the first quadrant	9.1-9.3 9.9 10.6	Quadrant Plot  • Hidden Treasure Game	*	
5.G.13 Plot points to form basic geometric shapes (identify and classify)	3.7 9.1 9.2-9.3 9.9		*	
5.G.14 Calculate perimeter of basic geometric shapes drawn on a coordinate plane (rectangles and shapes composed of rectangles having sides with integer lengths and parallel to the axes)	Parts of Unit 9	Perimeter Coordinate plane	*	

**3.4: Measurement Strand**

**3.4a Students will determine what can be measured and how, using appropriate methods and formulas.**

**Units of Measurement**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
5M.1 Use a ruler to measure to the nearest inch, and inch	5.6 7.9	•SRB pg. 166-198	*	
5.M.2 Identify customary equivalent units of length	7.9	Customary Equivalent  •SRB pg. 166-198	*	
5.M.3 Measure to the nearest centimeter	5.6	Centimeter	*	
5.M.4 Identify equivalent metric units of length	6.2	Identify Metric Equivalent 4 <sup>th</sup> Grade Lessons: 4.7-4.9	*	
5.M.5 Convert measurement within a given system	1.1 6.2 9.10	Convert system	*	

**Tools and Methods**

5.M.6 Determine the tool and technique to measure with an appropriate level of precision: lengths and angles	3.3-3.6 3.10 6.2 7.9 8.2	Technique Precision	*	
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3.4b Students will use units to give meaning to measurements				
Units				
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
5.M.7 Calculate elapsed time in hours and minutes	2.10 5.12 10.5	Elapsed time	*	
5.M.8 Measure and draw angles using a protractor	3.4 3.9 4.3	Protractor	*	

3.4c Students will develop strategies for estimating measurements				
Estimation				
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
5.M.9 Determine personal references for customary units of length (i.e., your pace is approximately 3 feet; your height is approximately 5 feet, etc.)	4.3 5.9	Personal reference Approximate	*	
5.M.10 Determine personal references for metric units of length	4.3		*	
5.M.11 Justify the reasonableness of estimates	3.2 4.4-4.5	Reasonableness	*	

### 3.5: Statistics and Probability Strand

3.5a Students will collect, organize, display, and analyze data				
Collection of Data				
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
5.S.1 Collect and record data from a variety of sources (i.e., newspapers, magazines, polls, charts, and surveys)	2.5 6.3 3.1 6.5 5.9 10.5-10.6 6.1 12.7	Collect data Record data	*	
Organization and Display of Data				
5.S.2 Display data in a line graph to show an increase or decrease over time	6.6 10.5-10.7 9.1 12.7	Display data Line graph Increase Decrease	*	
Analysis of Data				
5.S.3 Calculate the mean for a given set of data and use to describe a set of data	1.1 6.1 2.5-2.6 6.3 3.4 6.5-6.6 12.7	Mean Set of data	*	

3.5b Students will make predictions that are based upon data analysis					
Predictions from Data					
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON		VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
5.S.4 Formulate conclusions and make predictions from graphs	2.5 3.2 3.4 5.9 5.12	6.1-6.2 6.5-6.6 6.10 8.11 10.5-10.7	Formulate Conclusions Predictions	*	

3.5c Students will understand and apply concepts of probability.					
Probability					
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON		VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
5.S.5 List the possible outcomes for a single-event experiment	2.5 6.10 12.1-12.2		Outcomes Single event Experiment		*
5.S.6 Record experiment results using fractions/ratios	12.1 12.3-12.8		Experiment results Ratio		*
5.S.7 Create a sample space and determine the probability of a single event, given a simple experiment (i.e., rolling a number cube)	2.6 6.5 12.2		Sample space Probability Simple experiment		*

# Grade 6

## 3.1: Number Sense and Operations

**3.1a Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.**

### Number Systems

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.N.1 Read and write whole numbers to trillions	2.5-2.6	Whole numbers	*	
6.N.2 Define and identify the commutative and associative properties of addition and multiplication	3.2 6.5	Commutative property Associative property	*	
6.N.3 Define and identify the distributive property of multiplication over addition	9.1-9.5	Distributive property	*	
6.N.4 Define and identify the identity and inverse properties of addition and multiplication	6.1-6.5	Identity properties Inverse properties	*	
6.N.5 Define and identify the zero property of multiplication	3.1 3.2	Add zero property of multiplication	*	
6.N.6 Understand the concept of rate	3.5 8.1-8.5	Rate	*	
6.N.7 Express equivalent ratios as a proportion	8.1 8.3      8.4-8.7	Ratios Proportion	*	
6.N.8 Distinguish the difference between rate and ratio	8.3-8.7 8.9-8.12	Define difference between rate and ratio	*	
6.N.9 Solve proportions using equivalent fractions	8.1-8.3 8.5-8.8	Proportion Equivalent fractions	*	
6.N.10 Verify the proportionality using the product of the means equals the product of the extremes	8.3-8.8	Means Extremes Proportionality	*	
6.N.11 Read, write, and identify percents of a whole (0% to 100%)	4.11      8.4-8.5 5.1      8.7-8.8 5.7		*	
6.N.12 Solve percent problems involving percent, rate, and base	4.11      8.4-8.5 5.1      8.7-8.8	Percent      Base Rate	*	
6.N.13 Define absolute value and determine the absolute value of rational numbers (including positive and negative)	6.3 Enrichment	Absolute value Rational numbers SRB pg 994	*	
6.N.14 Locate rational numbers on a number line (including positive and negative)	4.2	Rational numbers	*	
6.N.15 Order rational numbers (including positive and negative)	4.2-4.3 8.8	Rational numbers	*	

**3.1b Students will understand meanings of operations and procedures, and how they relate to one another.**

**Operations**

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.N.16 Add and subtract fractions with unlike denominators	4.3 6.1 4.8-4.9 6.6 5.9 8.6-8.7	Fractions Denominators	*	
6.N.17 Multiply and divide fractions with unlike denominators	4.6-4.9 6.6 5.9 8.6 6.1-6.2		*	
6.N.18 Add, subtract, multiply, and divide mixed numbers with unlike denominators	3.10 6.1-6.2 4.1-4.4 6.6 4.6-4.9 8.6 5.9	Unlike denominators	*	
6.N.19 Identify the multiplicative inverse (reciprocal) of a number	4.6 6.1-6.2 5.9 6.6	Reciprocal Multiplicative inverse	*	
6.N.20 Represent fractions as terminating or repeating decimals	4.1 4.7-4.9 4.3 5.9 4.5	Terminating decimals Repeating decimals	*	
6.N.21 Find multiple representations of rational numbers (fractions, decimals, and percents 0 to 100)	4.3-4.5 5.1 4.7-4.9 5.7 4.11 5.9 8.7-8.8	Multiple representations Rational numbers Decimals Percents	*	
6.N.22 Evaluate numerical expressions using order of operations (may include exponents of two and three)	6.6 6.8 9.12	Order of operations	*	
6.N.23 Represent repeated multiplication in exponential form	2.7 2.8	Exponential form	*	
6.N.24 Represent exponential form as repeated multiplication	2.4		*	
6.N.25 Evaluate expressions having exponents where the power is an exponent of one, two, or three	2.7 9.12	Expression	*	

**3.1c Students will compute accurately and make reasonable estimates.**

**Estimation**

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.N.26 Estimate a percent of quantity (0% to 100%)	8.8	Justify	*	
6.N.27 Justify the reasonableness of answers using estimation (including rounding)	8.9	Justify	*	

**3.2: Algebra Strand**

**3.2a Students will represent and analyze algebraically a wide variety of problem solving situations.**

**Variables and Expressions**

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
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6.A.1 Translate two-step verbal expressions into algebraic expressions	3.3 3.9 6.5	6.7-6.8 7.7 9.3	Expression Translate	*	
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### 3.2b Students will perform algebraic procedures accurately

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.A.2 Use substitution to evaluate algebraic expressions (may include exponents of one, two and three)	3.3-3.8 6.7-6.8	7.7 9.10	Substitution Algebraic expression Exponent	For 2 or more variables in expression
<b>Equations and Inequalities</b>				
6.A.3 Translate two-step verbal sentences into algebraic equations	6.5 6.7-6.10 7.2	8.2 9.1 9.4-9.6	Equations Algebraic	*
6.A.4 Solve and explain two-step equations involving whole numbers using inverse operations	6.5 6.7-6.11 7.2 8.2	9.1 9.3-9.6 9.11	Whole numbers Inverse operations	*
6.A.5 Solve simple proportions within context	8.1 8.2	8.7	Proportion	*
6.A.6 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.)	3.4 3.6 3.8 4.11	6.7-6.8 9.8-9.9 9.11- 9.12	Formula Circumference Area Volume Distance Temperature Interest	*

## 3.3: Geometry Strand

### 3.3a Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.

<b>Shapes</b>				
STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.G.1 Calculate the length of corresponding sides of similar triangles, using proportional reasoning	5.6 8.10 9.13	Similar Corresponding	*	
6.G.2 Determine the area of triangles and quadrilaterals (squares, rectangles, rhombi, and trapezoids) and develop formulas	6.7 9.1-9.2	9.8-9.9 9.11	Square Rectangle Rhombi Trapezoid	*
6.G.3 Use a variety of strategies to find the area of regular and irregular polygons	9.1 9.8-9.9 9.11	Regular polygon Irregular polygon	*	
6.G.4 Determine the volume of rectangular prisms by counting cubes and develop the formula	9.9 9.11	Prism Volume	*	
6.G.5 Identify radius, diameter, chords and central angles of a circle	1.8 9.8	Radius Chords Diameter Central angle	*	
6.G.6 Understand the relationship	9.8	Diameter	*	

between the diameter and radius of a circle		Radius		
6.G.7 Determine the area and circumference of a circle, using the appropriate formula	9.8-9.9 9.11	Circle Arc Sector	*	
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	1.8 5.1 5.3	Central angle	*	
6.G.9 Understand the relationship between the circumference and the diameter of a circle	1.8		*	

### 3.3d Students will apply coordinate geometry to analyze problem solving situations.

#### Coordinate Geometry

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.G.10 Identify and plot points in all four quadrants	5.4      5.5	Quadrant		*
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)	5.4      5.5	Coordinate plane Integer		*

## 3.4: Measurement Strand

### 3.4a Students will determine what can be measured and how, using appropriate methods and formulas.

#### Units of Measurement

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.M.1 Measure capacity and calculate volume of a rectangular prism	9.10	Capacity Rectangular prism	*	
6.M.2 Identify customary units of capacity (cups, pints, quarts, and gallons)	1.11	Cup          Quart Pint          Gallon	*	
6.M.3 Identify equivalent customary units of capacity (cups to pints, pints to quarts, and quarts to gallons)	1.11	Customary unit Equivalent	*	
6.M.4 Identify metric units of capacity (liter and milliliter)	1.11	Metric unit • SRB pg 337	*	
6.M.5 Identify equivalent metric units of capacity (milliliter to liter and liter to milliliter)	1.11	Milliliter Liter • SRB pg 337	*	

#### Tools and Methods

6.M.6 Determine the tool and technique to measure with an appropriate level of precision: capacity	9.13	Precision	*	
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### 3.4d Students will develop strategies for estimating measurements.

#### Estimation

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
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6.M.7 Estimate volume, area, and circumference (see figures identified in geometry strand)	9.8	Volume Area Circumference	*	
6.M.8 Justify the reasonableness of estimates	5.1 5.2 9.13	Reasonableness	*	
6.M.9 Determine personal references for capacity	1.11		*	

### 3.5: Statistics and Probability Strand

#### 3.5a Students will collect, organize, display, and analyze data.

##### Collection of Data

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
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	3.10	Sampling		*

##### Organization and Display of Data

6.S.2 Record data in a frequency table	7.1-7.3 7.8	Frequency table • add to lessons		*
6.S.3 Construct Venn diagrams to sort data	7.6	Venn Diagram		*
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)	1.2 1.5-1.8 3.10 4.10	Pictograph Bar graph		*

##### Analysis of Data

6.S.5 Determine the mean, mode and median for a given set of data	1.3 1.4	1.11 9.9	Mean Median Mode	*
6.S.6 Determine the range for a given set of data	1.2		Range	*
6.S.7 Read and interpret graphs	1.2 1.5-1.8 1.11	3.5-3.6 3.10 4.10		*

#### 3.5b Students will make predictions that are based upon data analysis.

##### Predictions from Data

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.S.8 Justify predictions made from data	1.2-1.10 3.6	Prediction	*	

#### 3.5c Students will understand and apply concepts of probability.

##### Probability

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
6.S.9 List possible outcomes for	7.1	Outcomes		*

compound events	7.3-.7.7	Compound event		
6.S.10 Determine the probability of dependent events	7.1 7.3-7.6	Probability Dependent event		*
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	7.1-7.7	Possible outcomes Fundamental Counting Principle		*

# Grade 7

## 3.1: Number Sense and Operations

**3.1a Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.**

### Number Systems

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
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 (e.g., explore different approximations of $\pi$ )				
7.N.3 Place rational and irrational numbers (approximations) on a number line and justify the placement of the numbers				
7.N.4 Develop the laws of exponents for multiplication and division				
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				
		<b>Number Theory</b>		
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.10 Determine the prime factorization of a given number and write in exponential form				

**3.1b Students will understand meanings of operations and procedures, and how they relate to one another.**

### Operations

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
7.N.11 Simplify expressions using order of operations <i>Note: Expressions may include absolute value and/or integral exponents greater than 0.</i>				
7.N.12 Add, subtract, multiply, and				

divide integers				
7.N.13 Add and subtract two integers (with and without the use of a number line)				
7.N.14 Develop a conceptual understanding of negative and zero exponents with a base of ten and relate to fractions and decimals (e.g., $10^{-2} = .01 = 1/100$ )				
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.17 Classify irrational numbers as non-repeating/non-terminating decimals				

### 3.1c Students will compute accurately and make reasonable estimates.

#### Estimation

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
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				

## 3.2: Algebra Strand

### 3.2a Students will represent and analyze algebraically a wide variety of problem solving situations.

#### Variables and Expressions

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
7.A.1 Translate two-step verbal expressions into algebraic expressions				

### 3.2b Students will perform algebraic procedures accurately

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
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				
Equations and Inequalities				
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.A.5 Solve one-step inequalities (positive coefficients only) (See 7.G.10)				
7.A.6 Evaluate formulas for given input values (surface area, rate, and density problems)				

**3.2c Students will recognize, use, and represent algebraically patterns, relations, and functions.**

**Patterns, Functions, and Relations**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
7.A.7 Draw the graphic representation of a pattern from an equation or from a table of data				
7.A.8 Create algebraic patterns using charts/tables, graphs, equations, and expressions				
7.A.9 Build a pattern to develop a rule for determining the sum of the interior angles of polygons				
7.A.10 Write an equation to represent a function from a table of values				

**3.3: Geometry Strand**

**3.3a Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.**

**Shapes**

<b>NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
7.G.1 Calculate the radius or diameter, given the circumference or area of a circle				
7.G.2 Calculate the volume of prisms and cylinders, using a given formula and a calculator				
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.4 Determine the surface area of prisms and cylinders,				

using a calculator and a variety of methods				
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### 3.3b Students will identify and justify geometric relationships, formally and informally.

#### Geometric Relationships

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
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.7 Find a missing angle when given angles of a quadrilateral				
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				

### 3.3d Students will apply coordinate geometry to analyze problem solving situations.

#### Coordinate Geometry

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
7.G.10 Graph the solution set of an inequality (positive coefficients only) on a number line (See 7.A.5)				

## 3.4: Measurement Strand

### 3.4a Students will determine what can be measured and how, using appropriate methods and formulas.

#### Units of Measurement

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
7.M.1 Calculate distance using a map scale				
7.M.2 Convert capacities and volumes within a given system				
7.M.3 Identify customary and metric units of mass				
7.M.4 Convert mass within a given system				
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				
7.M.8 Draw central angles in a given circle using a protractor (circle graphs)				
<b>Tools and Methods</b>				
7.M.9 Determine the tool and technique to measure with an appropriate level of precision: mass				

**3.4d Students will develop strategies for estimating measurements.**

<b>Estimation</b>				
STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
7.M.10 Identify the relationships between relative error and magnitude when dealing with large numbers (e.g., money, population)				
7.M.11 Estimate surface area				
7.M.12 Determine personal references for customary /metric units of mass				
7.M.13 Justify the reasonableness of the mass of an object				

### 3.5: Statistics and Probability Strand

**3.5a Students will collect, organize, display, and analyze data.**

<b>Collection of Data</b>				
STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
7.S.1 Identify and collect data using a variety of methods				
<b>Organization and Display of Data</b>				
7.S.2 Display data in a circle graph				
7.S.3 Convert raw data into double bar graphs and double line graphs				
<b>Analysis of Data</b>				
7.S.4 Calculate the range for a given set of data				
7.S.5 Select the appropriate measure of central tendency				
7.S.6 Read and interpret data represented graphically (pictograph, bar graph, histogram, line graph, double line/bar graphs or circle graph)				

**3.5b Students will make predictions that are based upon data analysis.**

<b>Predictions from Data</b>				
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<b>STATE STANDARD</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
7.S.7 Identify and explain misleading statistics and graphs				

**3.5c Students will understand and apply concepts of probability.**

**Probability**

<b>STATE STANDARD</b>	<b>UNIT/LESSON</b>	<b>VOCABULARY / • SUGGESTIONS</b>	<b>Pre March Instruction</b>	<b>Post March Instruction</b>
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				

# Grade 8

## 3.1: Number Sense and Operations

**3.1b Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.**

### Number Systems

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.N.1 Develop and apply the laws of exponents for multiplication and division				
8.N.2 Evaluate expressions with integral exponents				
8.N.3 Read, write, and identify percents less than 1% and greater than 100%				
8.N.4 Apply percents to: Tax Percent increase/decrease Simple interest Sale price Commission Interest rates Gratuities				

**3.1c Students will compute accurately and make reasonable estimates.**

### Estimation

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.N.5 Estimate a percent of quantity, given an application				
8.N.6 Justify the reasonableness of answers using estimation				

## 3.2: Algebra Strand

**3.2a Students will represent and analyze algebraically a wide variety of problem solving situations.**

### Variables and Expressions

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.A.1 Translate verbal sentences into algebraic inequalities				
8.A.2 Write verbal expressions that match given mathematical expressions				
8.A.3 Describe a situation involving relationships that matches a given graph				
8.A.4 Create a graph given a description or an expression for a situation involving a linear or nonlinear relationship				

8.A.5 Use physical models to perform operations with polynomials				
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**3.2b Students will perform algebraic procedures accurately**

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.A.6 Multiply and divide monomials				
8.A.7 Add and subtract polynomials (integer coefficients)				
8.A.8 Multiply a binomial by a monomial or a binomial (integer coefficients)				
8.A.9 Divide a polynomial by a monomial (integer coefficients) <i>Note: The degree of the denominator is less than or equal to the degree of the numerator for all variables.</i>				
8.A.10 Factor algebraic expressions using the GCF				
8.A.11 Factor a trinomial in the form $ax^2 + bx + c$ ; $a=1$ and $c$ having no more than three sets of factors				
<b>Equations and Inequalities</b>				
8.A.12 Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by intersecting lines				
8.A.13 Solve multi-step inequalities and graph the solution set on a number line				
8.A.14 Solve linear inequalities by combining like terms, using the distributive property, or moving variables to one side of the inequality (include multiplication or division of inequalities by a negative number)				

**3.2c Students will recognize, use, and represent algebraically patterns, relations, and functions.**

<b>Patterns, Functions, and Relations</b>				
NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instructio n	Post March Instruction
8.A.15 Understand that numerical information can be represented in multiple ways: arithmetically, algebraically, and				

graphically				
8.A.16 Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line				
8.A.17 Define and use correct terminology when referring to function (domain and range)				
8.A.18 Determine if a relation is a function				
8.A.19 Interpret multiple representations using equation, table of values, and graph				

### 3.3: Geometry Strand

**3.3a Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.**

#### Shapes

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.G.0 Construct the following, using a straight edge and compass: <ul style="list-style-type: none"> <li>segment congruent to a segment</li> <li>Angle congruent to an angle</li> <li>Perpendicular bisector</li> <li>Angle bisector</li> </ul>				

**3.3b Students will identify and justify geometric relationships, formally and informally.**

#### Geometric Relationships

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.G.1 Identify pairs of vertical angles as congruent				
8.G.2 Identify pairs of supplementary and complementary angles				
8.G.3 Calculate the missing angle in a supplementary or complementary pair				
8.G.4 Determine angle pair relationships when given two parallel lines cut by a transversal				
8.G.5 Calculate the missing angle measurements when given two parallel lines cut by				

a transversal				
8.G.6 Calculate the missing angle measurements when given two intersecting lines and an angle				

### 3.3c Students will apply transformations and symmetry to analyze problem solving situations

#### Transformational Geometry

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.G.7 Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations)				
8.G.8 Draw the image of a figure under rotations of 90 and 180 degrees				
8.G.9 Draw the image of a figure under a reflection over a given line				
8.G.10 Draw the image of a figure under a translation				
8.G.11 Draw the image of a figure under a dilation				
8.G.12 Identify the properties preserved and not preserved under a reflection, rotation, translation, and dilation				

### 3.3d Students will apply coordinate geometry to analyze problem solving situations.

#### Coordinate Geometry

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.G.13 Determine the slope of a line from a graph and explain the <i>meaning of slope as a constant rate of change</i>				
8.G.14 Determine the y-intercept of a line from a graph and be able to explain the y-intercept				
8.G.15 Graph a line using a table of values				
8.G.16 Determine the equation of a line given the slope and the y-intercept				
8.G.17 Graph a line from an equation in slope-intercept form ( $y = mx + b$ )				
8.G.18 Solve systems of equations graphically (only linear, integral solutions, $y = mx + b$ format, no				

vertical/horizontal lines)				
8.G.19 Graph the solution set of an inequality on a number line				
8.G.20 Distinguish between linear and nonlinear equations $ax^2 + bx + c$ ; $a=1$ (only graphically)				
8.G.21 Recognize the characteristics of quadratics in tables, graphs, equations, and situations				

### 3.4: Measurement Strand

3.4a Students will determine what can be measured and how, using appropriate methods and formulas.

#### Units of Measurement

STATE STANDARD	UNIT/LESSON	VOCABULARY / • SUGGESTIONS	Pre March Instruction	Post March Instruction
8.M.1 Solve equations/proportions to convert to equivalent measurements within metric and customary measurement systems <i>Note: Also allow Fahrenheit to Celsius and vice versa.</i>				