

# NEW YORK

# MATHEMATICS

## LEARNING STANDARDS

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# To the Student

This book will help you review, practice, and master the New York Mathematics Learning Standards and Core Curriculum. Here are the steps to follow to use this book.

1. Take the Tryout Test and check your answers. Use the chart at the bottom of this page to find out your strengths and weaknesses in the areas covered. Don't be discouraged if you don't get all the answers right or if you don't understand some questions. Remember the questions that are hard for you to answer. They will be the types of questions you need to work on the most.
2. Work through the lessons that follow the Tryout Test. Each lesson reviews example items and provides a practice test based on the performance indicators. Fill in the Keeping Score chart on page 83 as you complete each practice test.
3. After completing all the lessons, take the Mastery Test. Your score on this test will show your understanding of the Mathematics Learning Standards and Core Curriculum.

By following the steps outlined above, you will increase your mastery of the New York Mathematics Learning Standards and Core Curriculum.

<b>Lesson</b>	<b>Tryout Test Items</b>	<b>Mastery Test Items</b>
<b>1</b> Number Sense	3, 9, 12, 19, 29	5, 9, 12, 19, 29
<b>2</b> Operations	5, 7, 8, 18, 20, 23	3, 7, 8, 18, 20
<b>3</b> Patterns and Properties	1, 4, 6, 22, 30	1, 4, 6, 22, 23, 30
<b>4</b> Geometry	2, 15, 27, 28	2, 15, 27, 28
<b>5</b> Measurement	13, 16, 17, 21, 26	13, 16, 17, 21, 26
<b>6</b> Data Analysis	10, 11, 14, 24, 25, 31	10, 11, 14, 24, 25, 31

# Table of Contents

**Test-Taking Tips** . . . . . Inside Front Cover

**To the Student.** . . . . . 2

**Tryout Test** . . . . . 4

This test will tell you how well you understand the New York Learning Standards for Mathematics before using this book.

**Lesson 1—Number Sense**

Reading and Writing Whole

Numbers [3.N.2]. . . . . 13

Place Value [3.N.4]. . . . . 14

Expanded Notation [3.N.5]. . . . . 14

Comparing and Ordering Whole

Numbers [3.N.3, 3.A.1]. . . . . 15

Understanding Fractions

[3.N.10, 3.N.11, 3.N.12, 3.N.13] . . . . . 16

Open-Ended Practice:

Comparing and Ordering Whole

Numbers [3.N.3, 3.A.1]. . . . . 18

**Test Practice 1** . . . . . 19

**Lesson 2—Operations**

Addition [3.N.18] . . . . . 22

Subtraction [3.N.18] . . . . . 23

Multiplication [3.N.19, 3.N.21] . . . . . 24

Division [3.N.22] . . . . . 25

Basic Facts Drill: Multiplication . . . . . 26

Basic Facts Drill: Division . . . . . 27

Estimation [3.N.25, 3.N.27] . . . . . 28

Open-Ended Practice:

Selecting an Operation [3.N.24]. . . . . 30

**Test Practice 2** . . . . . 31

**Lesson 3—Patterns and Properties**

Geometric Patterns [3.A.2] . . . . . 34

Number Patterns [3.N.1, 3.A.2] . . . . . 35

Even and Odd Numbers

[3.N.16, 3.N.17] . . . . . 36

Multiplication Properties

[3.N.6, 3.N.7, 3.N.8] . . . . . 37

Addition Properties [3.N.6, 3.N.9] . . . . . 38

Open-Ended Practice:

Addition Properties [3.N.6, 3.N.9]. . . . . 39

**Test Practice 3** . . . . . 40

**Lesson 4—Geometry**

Two-Dimensional Shapes [3.G.1] . . . . . 43

Three-Dimensional Shapes

[3.G.3, 3.G.4]. . . . . 45

Symmetry [3.G.5] . . . . . 46

Open-Ended Practice:

Symmetry [3.G.5] . . . . . 47

**Test Practice 4** . . . . . 48

**Lesson 5—Measurement**

Length [3.M.1, 3.M.2, 3.M.10] . . . . . 51

Weight [3.M.3, 3.M.10] . . . . . 53

Capacity [3.M.4, 3.M.5, 3.M.6, 3.M.10] . . . . . 54

Counting Money [3.M.7] . . . . . 55

Telling Time [3.M.8, 3.M.9] . . . . . 56

Open-Ended Practice:

Non-Standard Units [3.M.10] . . . . . 58

**Test Practice 5** . . . . . 59

**Lesson 6—Data Analysis**

Displaying Data [3.S.3, 3.S.4, 3.S.5] . . . . . 62

Reading and Interpreting Data [3.S.7] . . . . . 66

Making Predictions [3.S.8] . . . . . 66

Open-Ended Practice:

Comparing Graphs [3.S.6] . . . . . 67

**Test Practice 6** . . . . . 68

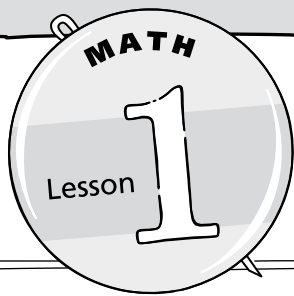
**Mastery Test** . . . . . 72

This test will tell you how well you understand the New York Learning Standards for Mathematics after using this book.

**Keeping Score** . . . . . 83

**Finding Percent** . . . . . 84

**Mathematics Chart**. . . . . Inside Back Cover



# Number Sense

Reading and Writing  
Whole Numbers  
Place Value  
Expanded Notation

Comparing and Ordering  
Whole Numbers  
Understanding Fractions



Examples 1–8: Read each question. Choose the best answer or write the answer to the question in the space you are given.

## Reading and Writing Whole Numbers

- 1 Write the number *eight hundred six* on the line below.

Answer: \_\_\_\_\_



## Remember

If there are no tens in a number, you write 0 in the tens place.

*three hundred nine*      **309**

If there are no ones in a number, you write 0 in the ones place.

*seven hundred fifty*      **750**

## Step-By-Step

To solve **example 1**, you must figure out how many hundreds, tens, and ones the number has.

- 1 How many hundreds are in the number? Write that number in the hundreds place.

8	_____	_____
<b>hundreds</b>	tens	ones

- 2 How many tens are in the number? Write that number in the tens place.

8	<input type="text"/>	_____
hundreds	<b>tens</b>	ones

- 3 How many ones are in the number? Write that number in the ones place.

8	0	<input type="text"/>
hundreds	tens	<b>ones</b>



## Place Value

2 How many tens are in the number 239?

- (A) 2                      (C) 5  
 (B) 3                      (D) 9



### Place Value

Each digit in a number has a **place value**. The place value tells you how much the digit is worth.

## Expanded Notation

3 Which shows the expanded notation of the number 542?

- (A)  $500 + 40 + 2$   
 (B)  $500 + 42 + 2$   
 (C)  $500 + 4 + 2$   
 (D)  $500 + 42$



### Remember

A number like 203 has no tens. Its expanded notation shows just hundreds and ones:

$$203 = 200 + 3$$

A number like 480 has no ones. Its expanded notation shows just hundreds and tens:

$$480 = 400 + 80$$

## Step-By-Step

For **example 2**, use a place-value chart to find the value of each digit.

1 Write the number in a place-value chart.

Hundreds	Tens	Ones
2		

2 Choose the number in the tens place.

## Step-By-Step

**Example 3** asks you to find the expanded notation of a number.

**Expanded notation** shows the place value of each digit in a number.

1 Say the first digit of the number followed by its place value. Then write that number in the expanded notation.

5 hundreds



500 +        +       

2 Say each of the other digits in the number followed by its place value. Write those numbers in the expanded notation.

4 tens

2 ones



500 +        +

## Comparing and Ordering Whole Numbers

- 4 One sunflower is 227 centimeters tall. Another is 235 centimeters tall. Which correctly compares the heights of the two sunflowers?

- Ⓐ  $227 = 235$       Ⓒ  $227 < 235$   
 Ⓑ  $235 < 227$       Ⓓ  $227 > 235$



### Remember

$>$  means *greater than*

$<$  means *less than*

$=$  means *equal to*

- 5 Write these numbers in order from least to greatest.

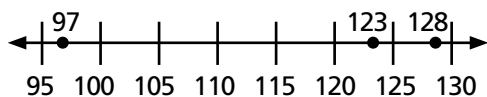
97    128    123

Answer: \_\_\_\_\_



### Comparing Numbers on a Number Line

You can also use a number line to compare numbers.



The numbers become greater as you move to the right on the number line.

### Step-By-Step

To solve **example 4**, line up the numbers by place value. Then compare the digits.

- 1 Line up the numbers by place value.

227  
235

- 2 Compare the digits in the hundreds place. The digits are the same.

227  
235

- 3 Compare the digits in the tens place. 2 is less than 3. So 227 is less than 235.

227  
235

- 4 Select the answer that means the same as *227 is less than 235*.

### Step-By-Step

Follow these steps to solve **example 5**.

- 1 The number with the fewest places is the least. Write that number first.

97

- 2 Compare 128 and 123. Start at the left. Look for the first place where the digits are different. Compare the digits. 3 is less than 8, so 123 is less than 128.

128  
123

- 3 Write the numbers in order from least to greatest.

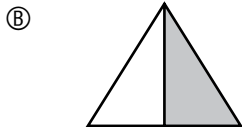
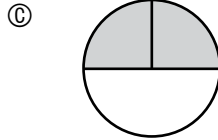
97



GO ON

## Understanding Fractions

6 Which drawing is  $\frac{2}{3}$  shaded?



## Step-By-Step

To solve **example 6**, you must know what the numbers in the fraction mean.

1 The bottom number of the fraction  $\frac{2}{3}$  tells you to look for a drawing that has 3 equal parts.

3 equal parts  $\longrightarrow \frac{2}{3}$

2 The top number of the fraction tells you that 2 of the parts are shaded:

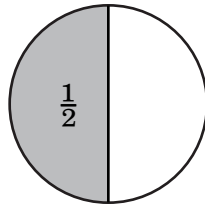
2 shaded parts  $\longrightarrow \frac{2}{3}$

3 Look for the shape that is divided into 3 equal parts and has 2 shaded parts.



## Fractions

A **fraction** is a number that names a **part of a whole**. In this drawing, there are 2 equal parts. 1 part is shaded. The fraction  $\frac{1}{2}$  names the part of the drawing that is shaded.



$\frac{\text{Number of shaded parts}}{\text{Total number of equal parts}} \longrightarrow \frac{1}{2}$

The bottom number of a fraction is called the **denominator**.  
The top number is called the **numerator**.

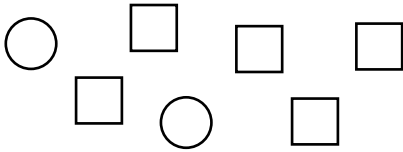
A fraction can also be used to name **parts of a group**. There are 5 stars in this group. 1 star is shaded. The fraction for the shaded part of the group is  $\frac{1}{5}$ .



$\frac{\text{Number of shaded stars}}{\text{Total number of stars}} \longrightarrow \frac{1}{5}$

## Understanding Fractions

- 7 What fraction of the shapes are circles?



(A)  $\frac{5}{7}$

(C)  $\frac{7}{2}$

(B)  $\frac{2}{5}$

(D)  $\frac{2}{7}$



### Hint

To remember the difference between the numerator and the denominator, think of the word *down* with the word *denominator*. The **d**enominator is **d**own—the bottom number of the fraction.

$$\frac{\text{numerator}}{\text{denominator}} \rightarrow \frac{1}{2}$$

## Step-By-Step

To solve **example 7**, first write the fraction in words. Then fill in the numbers.

- 1 Write a word fraction that compares the number of circles to the total number of shapes.

$$\frac{\text{Number of circles}}{\text{Total number of shapes}}$$

- 2 Count the total number of shapes. This is the denominator of the fraction.

$$\frac{\text{Number of circles}}{\text{Total number of shapes}} \rightarrow \frac{\quad}{7}$$

- 3 Count the number of circles. This is the numerator of the fraction.

$$\frac{\text{Number of circles}}{\text{Total number of shapes}} \rightarrow \frac{\quad}{7}$$



### Practice It

Shade the shapes to show each fraction. The first one has been done for you.

(A)  $\frac{2}{5}$

(D)  $\frac{1}{3}$

(B)  $\frac{5}{8}$

(E)  $\frac{3}{5}$

(C)  $\frac{3}{4}$

GO ON



## Open-Ended Practice

The example below will give you practice answering open-ended questions. Show OR describe each step of your work, even if you did it in your head (“mental math”) or used a calculator. Explain in writing why you chose each of your steps.

### Comparing and Ordering Whole Numbers

- 8 Four students in Mrs. Atwater’s class are reading the same book. The chart shows the number of pages each student has read.

Name	Pages Read
Amy	87
Jason	92
Chris	78
Nora	102

List the names in order from the student who has read the most to the student who has read the least.

**Answer:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Explanation:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Step-By-Step

Make a plan to solve **example 8**. Then show your work and explain your thinking. Write clearly and label each step as in the example below.

**My plan:** *I will compare the numbers. Then I will write them in order from greatest to least. Then I will match the numbers to the names.*

**Step 1:** Order the numbers (from greatest to least).

102 \_\_\_\_\_

**Step 2:** Match the names to the numbers.

102    Nora  
92    \_\_\_\_\_  
87    \_\_\_\_\_  
78    \_\_\_\_\_

**Explanation:** *I compared and ordered the numbers. Then I matched the numbers to the names to write the names in order from greatest to least.*

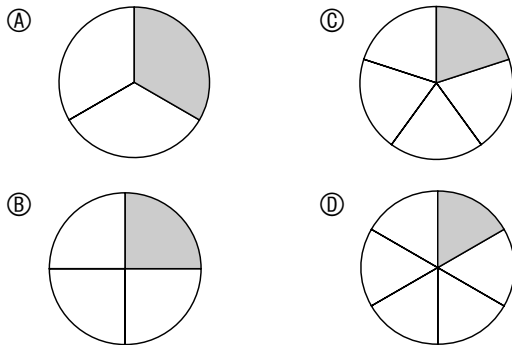


# Test Practice 1: Number Sense

Estimated time: 30 minutes

**Directions:** Read each question. Choose the best answer or write the answer to the question in the space given.

1 Which picture shows  $\frac{1}{3}$  of the circle shaded?



2 Write the number *six hundred forty*.

**Answer:** \_\_\_\_\_

3 Which is true?

- (A)  $135 > 500$
- (B)  $134 = 341$
- (C)  $612 < 576$
- (D)  $219 > 198$

4 Write the expanded notation for 207.

**Answer:** \_\_\_\_\_

5 When Mrs. Collins retired, she had taught a total of five hundred thirty-nine third graders. Which shows the number of students she taught?

- (A) 5,390
- (B) 5,039
- (C) 593
- (D) 539

6 Which fraction shows the shaded part of this group of stars?

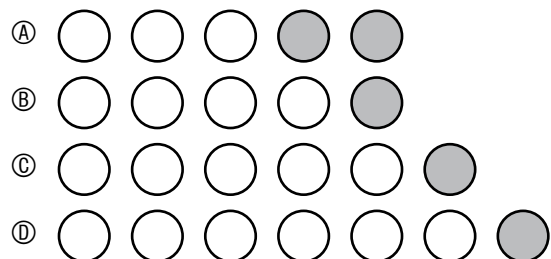


- (A)  $\frac{1}{6}$
- (B)  $\frac{1}{5}$
- (C)  $\frac{1}{3}$
- (D)  $\frac{1}{10}$

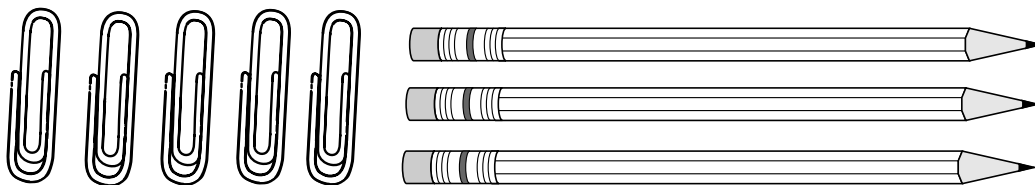
7 Write the number *two hundred fifty-nine* on the line below.

**Answer:** \_\_\_\_\_

8 In which set are  $\frac{1}{5}$  of the circles shaded?



9 Find the fraction that shows the number of pencils in the group.



(A)  $\frac{5}{8}$

(C)  $\frac{3}{3}$

(B)  $\frac{3}{8}$

(D)  $\frac{5}{5}$

10 Which shows the expanded notation for the number 693?

(A)  $600 + 9 + 3$

(C)  $600 + 90 + 30$

(B)  $600 + 93$

(D)  $600 + 90 + 3$

11 Write the numbers in order from greatest to least.

345    453    354

Answer: \_\_\_\_\_

12 What is the value of 4 in the number 648?

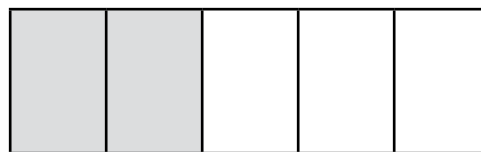
(A) 4 thousands

(C) 4 tens

(B) 4 hundreds

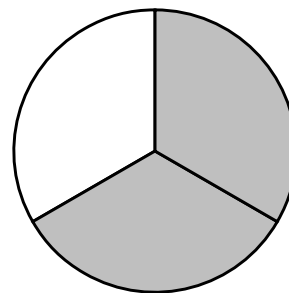
(D) 4 ones

13 Write the fraction name of the shaded part of the shape.



Answer: \_\_\_\_\_

14 Write the fraction that names the shaded part of the circle.



Answer: \_\_\_\_\_

15 The chart shows the weights of some animals at the petting zoo.

**Weights of Animals at the Petting Zoo**

Animal	Weight (in pounds)
Emu	132
Goat	105
Llama	335
Ostrich	307

Write the animal names in order from lightest to heaviest on the Answer line below.

Show OR describe each step of your work, even if you did it in your head (“mental math”).

**Answer:** \_\_\_\_\_

**Explanation:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



Points Earned/Total Possible = \_\_\_\_\_/23

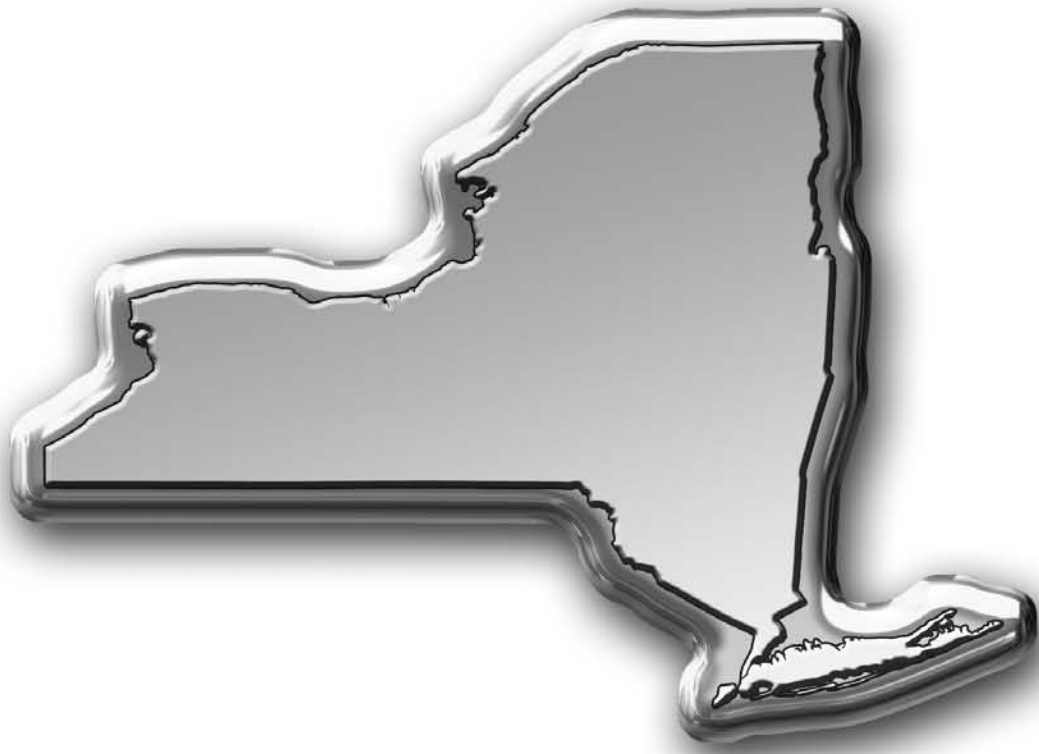
Review,  
Practice,  
& Mastery of

Teacher Guide • Grade 3

# NEW YORK

## MATHEMATICS

### LEARNING STANDARDS



## To the Teacher

The *Review, Practice, and Mastery* program is a refresher course. It provides a self-directed approach to reviewing and practicing the New York Mathematics Learning Standards and Core Curriculum. This booklet covers the Grade 3 Mathematics Content Strands.

Use the following steps to incorporate *Review, Practice, and Mastery* into your classroom.

1. Have students take the Tryout Test. You may wish to have students enter their answers in the reproducible Student Information and Answer Sheet on pages 10–12 of this teacher guide. After completing the Tryout Test, have students check their answers. Then have them use the reproducible Skills Chart on page 8 of this teacher guide to assess their strengths and weaknesses in the areas covered. (The chart below is also available in the student book.)
2. Have students work through the lessons, paying close attention to the areas in which they need improvement. You will see that each lesson page correlates to one or more of the topics in the New York Content Strands. Each lesson is followed by a practice test that focuses on the skills covered in the lesson. Have students fill in the Keeping Score chart on page 83 of the student book after they complete each test.
3. After completing all the lessons, have students take the Mastery Test to check their progress. Again, you may wish to have students enter their answers on the reproducible Student Information and Answer Sheet on pages 13–15 of this teacher guide.

The chart that begins on page 16 of this teacher guide correlates the lessons to the New York Mathematics Learning Standards and Core Curriculum for grade 3.

Lesson	Tryout Test Items	Mastery Test Items
<b>1</b> Number Sense	3, 9, 12, 19, 29	5, 9, 12, 19, 29
<b>2</b> Operations	5, 7, 8, 18, 20, 23	3, 7, 8, 18, 20
<b>3</b> Patterns and Properties	1, 4, 6, 22, 30	1, 4, 6, 22, 23, 30
<b>4</b> Geometry	2, 15, 27, 28	2, 15, 27, 28
<b>5</b> Measurement	13, 16, 17, 21, 26	13, 16, 17, 21, 26
<b>6</b> Data Analysis	10, 11, 14, 24, 25, 31	10, 11, 14, 24, 25, 31

# Tryout Test, Skills Chart

Question	1. Number Sense	2. Operations	3. Patterns and Properties	4. Geometry	5. Measurement	6. Data Analysis	
1							
2							
3							
4							
5							
6							
7							
8							
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10							
11							
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19							
20							
21							
22							
23							
24							
25							
26					/2		
27				/2			
28				/2			
29	/2						
30			/3				
31						/3	
<b>Total</b>	<b>/6</b>	<b>/6</b>	<b>/7</b>	<b>/6</b>	<b>/6</b>	<b>/8</b>	<b>/39</b>



Use this chart to find your strengths and weaknesses in the skills covered on the math part of New York's state test.

- Place the number of points earned in each white box. For each incorrect answer, place a 0 in the white box.
- Add each column and write the total points earned in the box at the bottom of the column.
- For example, if you answer questions 3, 9, and 12 correctly, you have 3 out of 6 correct on the Number Sense part of the test. You may want to focus on these skills as you work through the lessons.

# New York Mathematics Learning Standards

This chart matches the Grade 3 New York Learning Standards and Core Curriculum to the lessons in *Review, Practice, and Mastery*.

Number Sense and Operations Strand	
<b>Lesson 1</b> Number Sense	<p>3.N.1 <i>See lesson 3, Patterns and Properties</i></p> <p>3.N.3 Compare and order numbers to 1,000</p> <p>3.N.4 Understand the place value structure of the base ten number system:</p> <ul style="list-style-type: none"> <li>• 10 ones = 1 ten</li> <li>• 10 tens = 1 hundred</li> <li>• 10 hundreds = 1 thousand</li> </ul> <p>3.N.5 Use a variety of strategies to compose and decompose three-digit numbers</p> <p>3.N.6–9 <i>See lesson 3, Patterns and Properties</i></p> <p>3.N.10 Develop an understanding of fractions as part of a whole unit and as parts of a collection</p> <p>3.N.11 Use manipulatives, visual models, and illustrations to name and represent unit fractions (<math>\frac{1}{2}</math>, <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{1}{6}</math>, and <math>\frac{1}{10}</math>) as part of a whole or a set of objects</p> <p>3.N.12 Understand and recognize the meaning of numerator and denominator in the symbolic form of a fraction</p> <p>3.N.13 Recognize fractional numbers as equal parts of a whole</p> <p>3.A.1 Use the symbols <math>&lt;</math>, <math>&gt;</math>, <math>=</math> (with and without the use of a number line) to compare whole numbers</p> <p>3.N.16 <i>See lesson 3, Patterns and Properties</i></p> <p>3.N.17 <i>See lesson 3, Patterns and Properties</i></p>
<b>Lesson 2</b> Operations	<p>3.N.18 Use a variety of strategies to add and subtract 3-digit numbers (with and without regrouping)</p> <p>3.N.19 Develop fluency with single-digit multiplication facts (for 5 x 10 and below)</p> <p>3.N.21 Use the area model, tables, patterns, arrays, and doubling to provide meaning for multiplication</p> <p>3.N.22 Demonstrate fluency and apply single-digit division facts (for 50 divided by 10 and below)</p> <p>3.N.24 Develop strategies for selecting the appropriate computational and operational method in problem solving situations</p> <p>3.N.25 Estimate numbers up to 200</p> <p>3.N.27 Check reasonableness of an answer by using estimation</p>



<b>Algebra Strand</b>	
<b>Lesson 3</b> Patterns and Properties	<p>3.A.1 See lesson 1, Number Sense</p> <p>3.A.2 Describe and extend numeric (+, -) and geometric patterns</p> <p>3.N.1 Skip count by 25's, 50's, and 100's to 1,000</p> <p>3.N.2 Read and write whole numbers to 1,000</p> <p>3.A.1 Use the symbols &lt;, &gt;, = (with and without the use of a number line) to compare whole numbers</p> <p>3.N.6 Use and explain the commutative property of addition and multiplication</p> <p>3.N.7 Use 1 as the identity element for multiplication</p> <p>3.N.8 Use the zero property of multiplication</p> <p>3.N.9 Understand and use the associative property of addition</p> <p>3.N.16 Identify odd and even numbers</p> <p>3.N.17 Develop an understanding of the properties of odd/even numbers as a result of addition or subtraction</p>
<b>Geometry Strand</b>	
<b>Lesson 4</b> Geometry	<p>3.G.1 Define and use correct terminology when referring to shapes (circle, triangle, square, rectangle, rhombus, trapezoid, and hexagon)</p> <p>3.G.3 Name, describe, compare, and sort three-dimensional shapes: cube, cylinder, sphere, prism, and cone</p> <p>3.G.4 Identify the faces on a three-dimensional shape as two-dimensional shapes</p> <p>3.G.5 Identify and construct lines of symmetry</p>
<b>Measurement Strand</b>	
<b>Lesson 5</b> Measurement	<p>3.M.1 Select tools and units (customary) appropriate for the length measured</p> <p>3.M.2 Use a ruler/yardstick to measure to the nearest standard unit (whole and <math>\frac{1}{2}</math> inches, whole feet, and whole yards)</p> <p>3.M.3 Measure objects, using ounces and pounds</p> <p>3.M.4 Recognize capacity as an attribute that can be measured</p> <p>3.M.5 Compare capacities (i.e., Which contains more? Which contains less?)</p> <p>3.M.6 Measure capacity, using cups, pints, quarts, and gallons</p> <p>3.M.7 Count and represent combined coins and dollars, using currency symbols (\$0.00)</p> <p>3.M.8 Relate unit fractions to the face of the clock: <ul style="list-style-type: none"> <li>• Whole = 60 minutes</li> <li>• <math>\frac{1}{2}</math> = 30 minutes</li> <li>• <math>\frac{1}{4}</math> = 15 minutes</li> </ul> </p> <p>3.M.9 Tell time to the minute, using digital and analog clocks</p> <p>3.M.10 Select and use standard (customary) and non-standard units to estimate measurements</p>

## Statistics and Probability Strand

### Lesson 6 Data Analysis

- 3.S.3 Construct a frequency table to represent a collection of data
- 3.S.4 Identify the parts of pictographs and bar graphs
- 3.S.5 Display data in pictographs and bar graphs
- 3.S.6 State the relationships between pictographs and bar graphs
- 3.S.7 Read and interpret data in bar graphs and pictographs
- 3.S.8 Formulate conclusions and make predictions from graphs