

# FOUR QUARTER MATH FRAMEWORKS

for Comprehensive Instruction and Assessment

EXAMPLES OF QUARTER-BY-QUARTER PRIORITIES

Based on the Common Core standards and ISBE/ISAT Requirements.

Each week use a **Layered Curriculum** approach in which:

- ✓ Each week all students master **essential content and skills**.
- ✓ Each week students have opportunities to **exceed**—to do and learn more.

<i>Monday</i> Preview Orient Model Inspire	<i>Tuesday</i> Model and Guide	<i>Wednesday</i> Guide and Develop	<i>Thursday</i> Assess and Clarify	<i>Friday</i> Fix, Finish, Expand
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This set of quarter-by-quarter priorities was developed originally in collaboration with Chicago Public School teachers through a grant from the Illinois State Board of Education. It was revised based on the Common Core State Standards. The ISBE Goals are listed as schools transition from ISBE standards to the Common Core. Common Core math standards are incorporated, and those stated in smaller type come from the Common Core.

## Our Grade's Four-Quarter Math Framework

Insert the priorities for your students' progress each quarter. The following pages are examples—and resources for your choices of what students should learn each quarter. Also see the Common Core standards and CPS Learning Targets.

1st quarter	2nd quarter	3rd quarter	4th quarter

## KINDERGARTEN Example of a Four-Quarter Math Framework

### Kindergarten Overview from the Common Core State Standards

#### *Counting and Cardinality*

Know number names and the count sequence  
 Count to tell the number of objects  
 Compare numbers.

#### *Operations and Algebraic Thinking*

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from

1st quarter	2nd quarter	3rd quarter	4th quarter
<p>Goal 6: Numbers and Operations</p> <ul style="list-style-type: none"> <li>○ Count, read, write numbers 1-10</li> <li>○ Use matching and counting to tell if the number of objects is the same, more, or less than another.</li> </ul> <p>Goal 9: Geometry</p> <ul style="list-style-type: none"> <li>○ Identify and describe shapes</li> <li>○ Identify shapes as two-dimensional or three</li> <li>○ Model and draw shapes.</li> </ul> <p>Goal 10:</p> <ul style="list-style-type: none"> <li>○ Collect, organize and display data with pictographs</li> </ul>	<p>Goal 6: Numbers and Operations</p> <ul style="list-style-type: none"> <li>○ Count to answer “how many” questions</li> <li>○ Compare whole numbers</li> <li>○ Recognize number words to 10</li> <li>○ Solve addition and subtraction problems by using objects or drawings</li> <li>○ Add and subtract within 5</li> </ul> <p>Goal 7: Estimate and Measure</p> <ul style="list-style-type: none"> <li>○ Classify objects and count the objects in categories</li> </ul> <p>Goal 8: Algebra and Analytic Methods</p> <ul style="list-style-type: none"> <li>○ Describe patterns relationships</li> <li>○ Sort</li> <li>○ Classify</li> <li>○ Identify Patterns</li> </ul> <p>Goal 10: Collect, organize and display with graphs</p>	<p>Goal 6: Numbers and Operations</p> <ul style="list-style-type: none"> <li>○ Represent number facts to 20</li> <li>○ Add</li> <li>○ Count by 2’s, 10’s</li> <li>○ Count backwards</li> </ul> <p>Goal 7: Estimate and Measure</p> <ul style="list-style-type: none"> <li>○ Describe measurable attributes of objects.</li> <li>○ Directly compare two objects.</li> </ul> <p>Goal 8: Algebra and Analytic Methods</p> <ul style="list-style-type: none"> <li>○ Compose and decompose numbers from 11 to 10 into ten ones and some more ones.</li> </ul> <p>Goal 9: Geometry</p> <ul style="list-style-type: none"> <li>○ Compose simple shapes to form larger ones</li> </ul> <p>Goal 10: Collect, organize, display</p> <ul style="list-style-type: none"> <li>○ Data collection</li> <li>○ Interpretation</li> </ul>	<p>Goal 6: Numbers and Operations</p> <ul style="list-style-type: none"> <li>○ Count to 100 by ones and tens</li> <li>○ Subtract</li> <li>○ Word problems</li> </ul> <p>Goal 7: Estimate and Measure</p> <ul style="list-style-type: none"> <li>○ sizes</li> <li>○ time</li> </ul> <p>Goal 8: Algebra and Analytic Methods</p> <ul style="list-style-type: none"> <li>○ Decompose numbers less than or equal to 10 into pairs</li> </ul> <p>Goal 10: Collect, organize, display</p> <ul style="list-style-type: none"> <li>○ Data collection and interpretation</li> </ul>

**See the CPS Learning Targets (next page) for priorities for the year’s progress.**

# CPS Mathematics Learning Targets—KINDERGARTEN

By the end of Kindergarten, students will:

## **Number Sense**

- Read and write numbers up to 20
- Count by 1s up to 100
- Connect numbers to quantities
- Explore addition and subtraction situations using manipulatives, pictures, and symbols
- Explore quantity and number
- Begin to compare and order sets of objects

## **Measurement**

- Explore **Measurement** using non-standard units
- Construct a sense of time and order of events through daily activities
- Develop an initial understanding of comparing objects
- Incorporate estimation and **Measurement** in play activities

## **Algebra**

- Explore simple patterns such as sounds, shapes, colors, and sequences
- Describe and compare growth patterns (e.g., growing taller)

## **Geometry**

- Recognize shapes and structures in the environment
- Sort simple 2-dimensional and 3-dimensional shapes
- Find and name locations (e.g., “in front of,” “next to,” “behind”)

## **Data Analysis and Probability**

- Pose questions to gather and display data about themselves and their surroundings
- Predict what would happen next

## FIRST GRADE Example of a Four-Quarter Math Framework

1st quarter	2nd quarter	3rd quarter	4th quarter
<p><i>Goal 6: Numbers and Operations</i></p> <ul style="list-style-type: none"> <li>○ Count and read numerals to 100</li> <li>○ Addition of single digits</li> <li>○ Subtraction of single digits</li> <li>○ Count by 2's to 50</li> <li>○ Using words "greater than," "less than," and "equal to."</li> <li>○ Add and subtract within 20</li> </ul> <p><i>Goal 8: Algebra and Analytic Methods</i></p> <ul style="list-style-type: none"> <li>○ Use simple addition and subtraction number sentences</li> </ul> <p><i>Goal 7: Estimate and Measure</i></p> <ul style="list-style-type: none"> <li>○ Tell and write time in hours and half-hours</li> <li>○ Order three objects by length</li> </ul> <p><i>Goal 10:</i></p> <ul style="list-style-type: none"> <li>○ Number lines</li> </ul>	<p><i>Goal 6: Numbers and Operations</i></p> <ul style="list-style-type: none"> <li>○ Rounding by 5's, and 10's</li> <li>○ Count backwards from 20</li> <li>○ Count to 120.</li> <li>○ Addition/subtraction double digit (tens/ones) to 50</li> <li>○ Represent and solve problems involving addition and subtraction.</li> </ul> <p><i>Goal 8: Algebra and Analytic Methods</i></p> <ul style="list-style-type: none"> <li>○ Solve missing addend problems</li> <li>○ draw word problems</li> </ul> <p><i>Goal 7: Estimate and Measure</i></p> <ul style="list-style-type: none"> <li>○ Money value (penny, nickel, dime)</li> </ul> <p><i>Goal 9: Geometric shapes: Circle, square, triangles</i></p> <ul style="list-style-type: none"> <li>○ Build and draw shapes</li> </ul> <p><i>Goal 10:</i></p> <ul style="list-style-type: none"> <li>○ pictographs</li> </ul>	<p><i>Goal 6: Numbers and Operations</i></p> <ul style="list-style-type: none"> <li>○ Place value tens/ones</li> <li>○ Property of zero</li> <li>○ Apply properties of operations as strategies to add and subtract.</li> </ul> <p><i>Goal 7: Estimate and Measure</i></p> <ul style="list-style-type: none"> <li>○ Using ruler inch/feet</li> </ul> <p><i>Goal 9: Geometry</i></p> <ul style="list-style-type: none"> <li>○ Partition circles and rectangles into two and four equal shares.</li> </ul> <p><i>Goal 10:</i></p> <ul style="list-style-type: none"> <li>○ Organize, represent, and interpret data with up to three categories.</li> <li>○ Read and interpret bar graphs</li> </ul>	<p><i>Goal 6: Numbers and Operations</i></p> <ul style="list-style-type: none"> <li>○ Place value ones, tens, hundreds,</li> <li>○ Compare whole numbers up to 100</li> <li>○ Add within 100 including adding a two-digit number and a one-digit number</li> <li>○ Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90</li> </ul> <p><i>Goal 8: Algebra and Analytic Methods</i></p> <ul style="list-style-type: none"> <li>○ Determine if equations involving addition and subtraction are true or false</li> <li>○ Determine the unknown whole number in an addition or subtraction equation</li> </ul> <p><i>Goal 7: Estimate and Measure</i></p> <ul style="list-style-type: none"> <li>○ Liquid measures</li> </ul> <p><i>Goal 10:</i></p> <ul style="list-style-type: none"> <li>○ Read and interpret bar graphs</li> </ul>

**See the CPS Learning Targets (next page) for priorities for the year's progress.**

## **CPS Mathematics Learning Targets—FIRST GRADE**

By the end of Grade 1, students will:

### ***Number Sense***

- Count by 1s from zero past 100
- Skip count by 2s, 5s, and 10s past 100
- Estimate and count collection of objects using strategies and a calculator
- Use number words and numerals to represent quantities
- Understand ordinal, cardinal, odd, and even numbers
- Develop an understanding of base-ten up to 100 and use appropriate vocabulary
- Understand composing and decomposing single-digit whole numbers
- Understand and apply operations of addition and subtraction
- Understand  $\frac{1}{2}$  and  $\frac{1}{4}$  parts of a whole
- Understand and apply operations of addition and subtraction

### ***Measurement***

- Order and compare objects by attributes
- Explore *Measurement* using non-standard tools for length, weight/mass, and capacity/volume
- Develop an understanding of duration of time
- Develop an initial understanding of concepts of money

### ***Algebra***

- Understand common and uncommon attributes
- Describe relationships and solve problems involving simple patterns
- Describe and compare growth patterns
- Construct and solve simple number sentences with variables

### ***Geometry***

- Identify, model, compare, and sort simple 2-dimensional and 3-dimensional shapes in the environment
- Identify shapes that are the same
- Recognize shapes with a line of symmetry
- Develop an understanding of position of objects in space

### ***Data Analysis and Probability***

- Use simple methods to gather, organize, and display data
- Compare information from tables and graphs
- Identify possible and impossible events

## SECOND GRADE Example of a Four-Quarter Math Framework

**Learning Skills: Listen ↔ Follow Directions ↔ Collaborate ↔ Write Learning Reports ↔ Use Graphic Organizers**

1st quarter	2nd quarter	3rd quarter	4th quarter
<p><i>Goal 6: Numbers and Operations</i></p> <ul style="list-style-type: none"> <li>○ counting by 2's, 3's, 5's, and 10's to 1,000</li> <li>○ Add and subtract one and two digit numbers within 20</li> <li>○ Math facts-number families, doubles</li> <li>○ Use place value to add and subtract</li> </ul> <p><i>Goal 7: Estimate and Measure</i></p> <ul style="list-style-type: none"> <li>○ Money-coins and value</li> <li>○ Money-add and subtract with regrouping</li> <li>○ Time-hour, 1/2hr, 5 min, minute</li> <li>○ Estimate lengths using inches, feet, centimeters, meters</li> </ul> <p><i>Goal 10:</i></p> <ul style="list-style-type: none"> <li>○ Collecting data from graphs, use to add and subtract, compare and find patterns.</li> </ul>	<p><i>Goal 6: Numbers and Operations Patterns review</i></p> <ul style="list-style-type: none"> <li>○ Add and subtract two digits with regrouping</li> <li>○ Comparing whole numbers (odd and even)</li> <li>○ Comparing numbers <math>&gt;</math>, <math>&lt;</math>, <math>=</math>, and unequal.</li> <li>○ Use addition to find the total number of objects in arrays with up to 5 rows and 5 columns</li> </ul> <p><i>Goal 8: Algebra and Analytic Methods</i></p> <ul style="list-style-type: none"> <li>○ Explain method used to solve problems (solutions)</li> <li>○ Write an equation to express the total as a sum of equal addends</li> </ul> <p><i>Goal 10:</i></p> <ul style="list-style-type: none"> <li>○ Making graphs</li> <li>○ Writing questions</li> <li>○ Analyzing data gathered from graphs, charts</li> </ul>	<p><i>Goal 6: Numbers and Operations</i></p> <ul style="list-style-type: none"> <li>○ Add and subtract (two and three digit with regrouping)</li> <li>○ Read and write numbers to 1,000 using base-ten numerals, number names, and expanded form</li> <li>○ Reinforce addition and subtraction facts and concepts.</li> <li>○ Introduce multiplication</li> </ul> <p><i>Goal 8: Algebra and Analytic Methods</i></p> <ul style="list-style-type: none"> <li>○ Read, write and solve word problems</li> <li>○ Illustrate fractions</li> </ul> <p><i>Goal 7: Estimate and Measure</i></p> <ul style="list-style-type: none"> <li>○ Relate addition and subtraction to length</li> <li>○ Compare lengths in standard units of measure</li> </ul> <p><i>Goal 9: Geometry</i></p> <ul style="list-style-type: none"> <li>○ Identify shapes- 2 and 3 dimensional objects</li> </ul> <p><i>Goal 10:</i></p> <ul style="list-style-type: none"> <li>○ Create interpret and analyze information from graphs.</li> </ul>	<p><i>Goal 6: Numbers and Operations</i></p> <ul style="list-style-type: none"> <li>○ Addition and subtraction (two and three digit numbers) with and without regrouping</li> <li>○ Know from memory all sums of two one-digit numbers</li> <li>○ Compare two three-digit numbers based on meanings of the tens, hundreds, and ones using symbols to record the comparisons</li> <li>○ Add up to four two-digit numbers using strategies based on place value and properties of operations</li> </ul> <p><i>Goal 8: Algebra and Analytic Methods</i></p> <ul style="list-style-type: none"> <li>○ Read, write and solve word problems</li> </ul> <p><i>Goal 9: Geometry</i></p> <ul style="list-style-type: none"> <li>○ Congruency</li> <li>○ Symmetry</li> <li>○ Perimeter, area and volume</li> </ul> <p><i>Goal 10:</i></p> <ul style="list-style-type: none"> <li>○ Multiplication</li> </ul>

**See the CPS Learning Targets (next page) for priorities for the year's progress.**

## CPS Mathematics Learning Targets—SECOND GRADE

By the end of Grade 2, students will:

### **Number Sense**

- Skip count by 1s, 2s, 5s, 10s, and 100s up to 100
- Use multiple models to understand numerical relationships and the base-ten system
- Estimate, compute, and use a calculator to solve simple 1-digit and 2-digit addition and subtraction problems
- Solve equal grouping/sharing problems
- Develop an understanding of  $\frac{1}{2}$ ,  $\frac{1}{3}$ , and  $\frac{1}{4}$  using circle and rectangle models

### **Measurement**

- Use *Measurement* units and tools appropriately to measure lengths and temperature
- Develop an understanding of time and duration of time
- Compare objects using length, weight, and temperature
- Develop an understanding of money
- Develop an understanding of perimeter and area

### **Algebra**

- Solve problems involving patterns
- Sort and classify objects
- Solve word problems for unknowns

### **Geometry**

- Develop an understanding of 2-dimensional and 3-dimensional shapes
- Develop an understanding of direction and distance
- Understand lines of symmetry

### **Data Analysis and Probability**

- Use simple methods to collect, organize, compute, and interpret data
- Make predictions from simple data
- Use simple probability terms

## THIRD GRADE Example of a Four-Quarter Math Framework

1st quarter	2nd quarter	3rd quarter	4th quarter
<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Adding and subtracting (single, double, triple digits and money)</li> <li>○ Regrouping</li> <li>○ Place value (reading/numbers) up to 100,000</li> <li>○ Greater than and less than</li> <li>○ Number line</li> <li>○ Classify numbers, odd/even</li> <li>○ Interpret products of whole numbers, e.g., interpret <math>5^\circ - 7</math> as the total</li> <li>○ number of objects in 5 groups of 7 objects each</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Rounding to tens and hundreds</li> <li>○ Tell and write time to the nearest minute and measure time intervals</li> <li>○ in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Word problems single step</li> <li>○ Addition and subtraction including money</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Write and solve word problems</li> <li>○ Solve problems using graphs and tables</li> <li>○ Mean/average, median, mode</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities</li> <li>○ Determine the unknown whole number in a multiplication or division equation relating three whole numbers.</li> <li>○ Money (grouping and counting change, decimals)</li> <li>○ Elapsed time</li> <li>○ Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Rounding (tens, hundreds, thousands)</li> <li>○ Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Identify unnecessary information</li> <li>○ Evaluate methods and solutions</li> <li>○ Use variables and number sentences to represent solutions to problems</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Geometric figures (identify, describe, measure and compare)</li> <li>○ Perimeter, area, volume               <ul style="list-style-type: none"> <li>▪ 2-dimensional shapes</li> <li>▪ 3-dimensional shapes</li> <li>▪ congruence</li> <li>▪ coordinate system</li> <li>▪ hexagon</li> </ul> </li> <li>○ lines of symmetry</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Multiply 2 and 3 digits</li> <li>○ Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., <math>9^\circ - 80</math>, <math>5^\circ - 60</math>) using strategies based on place value and properties of operations.</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Compare quantities</li> <li>○ Volume</li> <li>○ Mass</li> <li>○ Metric units</li> <li>○ Standard measurement</li> <li>○ Rounding</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Solve multi-step problems involving data</li> <li>○ Interpretation</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Solve problems using graphs and charts</li> <li>○ Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.</li> <li>○ Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity.</li> <li>○ Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Long division</li> <li>○ Develop understanding of fractions as numbers: number line; equivalence</li> <li>○ Money</li> <li>○ Fluently multiply and divide within 100</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Rounding</li> <li>○ Time</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Word problems</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Solve problems using graphs and charts</li> <li>○ Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.</li> </ul>

**See the CPS Learning Targets (next page) for priorities for the year’s progress.**

## CPS Mathematics Learning Targets—THIRD GRADE

By the end of Grade 3, students will:

### **Number Sense**

- Use place value understanding of the base-ten number system to create multiple representation of numbers up to 100,000
- Identify, locate, order, and compare whole numbers, fractions, and decimals using monetary units
- Represent and use equivalent forms of simple fractions
- Compute using whole numbers and decimals (e.g. money)
- Understand relationships between addition and subtraction; multiplication and division
- Estimate using whole numbers and decimals
- Solve application problems using whole numbers and decimals (e.g., money - \$10.00 or less)
- Use arithmetic properties of identity

### **Measurement**

- Use *Measurement* units and tools appropriately to measure length, mass/weight, capacity/volume, and elapsed time
- Solve problems involving length, time and elapsed time, money, perimeter, area, volume/capacity, and mass/weight

### **Algebra**

- Solve problems involving patterns
- Solve problems using equations and number sentences
- Solve comparison problems

### **Geometry**

- Identify characteristics and properties of 2-dimensional and 3-dimensional shapes
- Solve problems using 2-dimensional and 3-dimensional shapes and properties
- Solve problems using the coordinate system
- Identify and sketch lines of symmetry
- Solve problems with reflection/flips, translations/slides, and rotations/turns

### **Data Analysis and Probability**

- Represent and analyze data using charts, tables, graphs, and Venn diagrams
- Find median and mode
- Use probability and counting principles in problem-solving situations

## FOURTH GRADE Example of a Four-Quarter Math Framework

1st quarter	2nd quarter	3rd quarter	4th quarter
<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Place Value</li> <li>○ Powers of ten</li> <li>○ Whole Numbers: Add, subtract, Multiply and divide by one two and three digits</li> <li>○ Use multiplication and division facts &lt; &gt; = 10,000</li> <li>○ Number line</li> <li>○ Add and subtract fractions with like denominators</li> <li>○ Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and</li> <li>○ problems that require expressing measurements given in a larger unit in terms of a smaller unit.</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Length, Area and perimeter</li> <li>○ Standard and metric measures</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Solve open number sentences</li> <li>○ Variables and equations</li> <li>○ Single step =, -, x, and division problems</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Graphs, charts, tables</li> <li>○ Compare, interpret data</li> <li>○ Number line</li> <li>○ Gather, organize, display data</li> <li>○ Graphing, tallies, mode, range</li> <li>○ Draw conclusions about probability</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Decimals-read, write identify (Thousand place)</li> <li>○ Compare decimals</li> <li>○ Fractions (relate to decimals)</li> <li>○ Percents</li> <li>○ Add, subtract, unlike fractions and mixed numbers</li> <li>○ Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted.</li> <li>○ Represent these problems using equations with a letter standing for the unknown quantity.</li> <li>○ Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</li> <li>○ Gain familiarity with factors and multiples.</li> <li>○ Compare two fractions with different numerators and different denominators</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Measure drawings models and angles</li> <li>○ Temperature and weight</li> <li>○ Conversions</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ 2 or more step word problems-measurement</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ rectangle</li> <li>○ reflection/flips rotations/turns</li> <li>○ translation/slides</li> <li>○ vertex</li> <li>○ congruence; symmetry</li> <li>○ parallel</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Identify model represent equivalent fractions</li> <li>○ Relate fractions/decimals</li> <li>○ Round decimals</li> <li>○ Use place value understanding to round multi-digit whole numbers to any place.</li> <li>○ Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators</li> <li>○ Compare two decimals to hundredths by reasoning about their size.</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Circle diameter radius and circumference</li> <li>○ Scale-maps</li> <li>○ Metric system</li> <li>○ Square units</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Multi-step measurement</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Figures, categorize</li> <li>○ Describe identify symmetry, shapes, sizes</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Interpret relationships</li> <li>○ Draw conclusions from data including probability</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Prime and composite numbers</li> <li>○ Percentages ratios proportions-select strategies</li> <li>○ Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations.</li> <li>○ Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Compare and order measures in standard and metric units</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Algebraic equations</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Properties and relationships-geometry lines, points, rays, angles</li> <li>○ Describe parts of geometric figures</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Mean or average of series of numbers</li> <li>○ Draw conclusions</li> <li>○ probability</li> </ul>

**See the CPS Learning Targets (next page) for priorities for the year's progress.**

## CPS Mathematics Learning Targets—FOURTH GRADE

By the end of Grade 4, students will:

### **Number Sense**

- Read, write, recognize, and model the base-ten number system and equivalent representations of numbers up to 1,000,000
- Use equivalent representations of fractions and decimals
- Identify, locate, order, and compare whole numbers, decimals, and fractions
- Compute using whole numbers, fractions, and decimals
- Estimate using whole numbers, fractions, and decimals
- Solve problems using number relationships
- Use ratios to describe problem situations
- Use commutative and distributive properties and inverse number relationships

### **Measurement**

- Use *Measurement* units and tools appropriately to measure weight/mass, length, volume/capacity, and angles
- Compare objects with respect to length, area, volume/capacity, temperature, and events with respect to time
- Solve problems using unit conversions within the same system for length, weight/mass, and time
- Estimate length, area, volume, and mass/weight

### **Algebra**

- Solve problems involving patterns
- Solve problems using equations and number sentences
- Represent mathematical situations using words, tables, and graphs

### **Geometry**

- Solve problems using 2-dimensional and 3-dimensional shapes and properties
- Solve problems using the coordinate system
- Use characteristics and properties of 2-dimensional and 3-dimensional shapes
- Identify and sketches lines of symmetry
- Solve problems with reflections/flips, translations/slides, and rotations/turns

### **Data Analysis and Probability**

- Collect, read, create, compare, interpret, and predict using data charts, tables, graphs, and Venn diagrams
- Solve problems using data
- Find range, median, and mode
- Use probability and counting principles in problem-solving situations

## FIFTH GRADE Example of a Four-Quarter Math Framework

1st quarter	2nd quarter	3rd quarter	4th quarter
<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Place value</li> <li>○ Powers of 10</li> <li>○ Decimals</li> <li>○ Ratios</li> <li>○ Proportions</li> <li>○ Percents</li> <li>○ Use place value understanding to round decimals to any place.</li> <li>○ Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction</li> </ul> <p><b>Goal 7: Estimate and Measure Standard</b></p> <ul style="list-style-type: none"> <li>○ Metric</li> <li>○ Rounding</li> <li>○ Elapsed time</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Single step addition, subtraction, multiplication, division</li> <li>○ measurement conversions</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Graphing-line, circle, bar</li> <li>○ Probability of an event</li> <li>○ Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Fractions-improper, mixed, simplify</li> <li>○ Add, subtract, and multiply fractions</li> <li>○ Division and multiplication of decimals and fractions</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Estimation, rounding, division</li> <li>○ Unit conversions</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Multi-step problems using fractions, decimals, measurement, and conversion.</li> <li>○ Analyze problem solving strategies</li> <li>○ Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Angles</li> <li>○ Polygons</li> <li>○ Circle</li> <li>○ Solids</li> <li>○ Area, perimeter, volume <ul style="list-style-type: none"> <li>▪ congruence</li> <li>▪ coordinate system</li> <li>▪ cube</li> <li>▪ cylinder</li> <li>▪ diameter</li> </ul> </li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Tallying</li> <li>○ line plot, stem and leaf</li> <li>○ Make predictions based on data in a graph or set of data</li> <li>○ Range, mean, median, mode</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Use percents, decimals, fractions in problem solving</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Algebraic representation</li> <li>○ Solve for the unknown</li> <li>○ Analyze problem solving strategies</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Weight</li> <li>○ Mass</li> <li>○ Volume</li> <li>○ Speed</li> <li>○ Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Averages</li> <li>○ Range, mean, median, mode</li> <li>○ probability</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Identify relationships: whole number, fraction, percentage, decimal</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Algebra concepts</li> <li>○ Compare alternative strategies to solve problems</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Time, distance, area</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Classify two-dimensional figures in a hierarchy based on properties.</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Use graphs and tables to interpret data in science and social studies</li> </ul>

**See the CPS Learning Targets (next page) for priorities for the year's progress.**

## CPS Mathematics Learning Targets—FIFTH GRADE

By the end of Grade 5, students will:

### **Number Sense**

- Read, write, recognize, and model base-ten number system and equivalent representation of numbers
- Read, write, model, convert, and use operations with fractions, decimals, and percents
- Compare and order numbers including fractions, decimals, and percents
- Compute fluently using whole numbers, decimals, and fractions
- Estimate using whole numbers, decimals, and fractions
- Solve problems using whole numbers, decimals, and fractions
- Use arithmetic properties such as identity, commutative, and distributive
- Use proportional reasoning
- Write, recognize, model, and interpret numerical expressions for a given situation

### **Measurement**

- Use *Measurement* units and tools appropriately
- Estimate length, area, volume, mass/weight, and angles
- Solve problems, including real-world problems, involving length, perimeter, area, volume (right rectangular prisms only), mass/weight, and angles
- Solve problems with unit conversions for time, length, mass/weight
- Solve problems with elapsed time
- Solve problems with scales in maps

### **Algebra**

- Solve problems using patterns, input-output tables, and inverse operations
- Solve problems using **Algebraic** expressions and equations
- Use tables of written and pictorial representations of whole numbers
- Solve problems with unknown quantities

### **Geometry**

- Identify, describe, sketch, and classify 2-dimensional shapes including circles
- Identify, describe, and sketch parallel, perpendicular, and intersecting lines
- Identify, describe, and sketch acute, obtuse, and right angles
- Use congruent and similar figures
- Copy line segments and angles using a straight edge and a compass
- Use characteristics and properties of 2-dimensional and 3-dimensional shapes
- Identify and sketch lines of symmetry
- Solve problems with reflections/flips, translations/slides, and rotations/turns
- Identify, locate, plot, and describe paths using the coordinate system

### **Data Analysis and Probability**

- Create, read, interpret, and make predictions from data tables, bar graphs, pictographs, line plots, Venn diagrams, and circle graphs
- Solve problems using data in graphs
- Find mean, median, mode, and range
- Use probability and counting principles in problem-solving situations

## 6<sup>th</sup> Grade Example of a Four-Quarter Math Framework

1st quarter	2nd quarter	3rd quarter	4th quarter
<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Whole numbers through trillions</li> <li>○ Compare and order quantities</li> <li>○ Powers and exponents</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Whole and decimal numbers (addition, subtraction, multiplication, and division)</li> <li>○ Integer number line</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Order of operations</li> <li>○ Write algebraic expressions</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Qualifiers</li> <li>○ Gather, organize, and display data</li> <li>○ Schedules</li> <li>○ Tables</li> <li>○ Range, mean, median, and mode</li> <li>○ Tallies</li> <li>○ Line plots</li> <li>○ Line, bar, and circle graphs</li> <li>○ Use rates and derived units in real-life situations</li> <li>○ Scattergrams, stem and leaf plot and box and whisker plot</li> <li>○ Develop understanding of statistical variability.</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Fractions (add, subtract, divide, multiply)</li> <li>○ Equivalent fractions</li> <li>○ Unlike denominators</li> </ul> <p><b>Goal 9 Geometry</b></p> <ul style="list-style-type: none"> <li>○ Geometric patterns and figures</li> <li>○ 2 to 3-dimensional shapes</li> <li>○ Line segments</li> <li>○ Bisectors</li> <li>○ Angles</li> <li>○ Triangles</li> <li>○ Circles</li> <li>○ Polygons</li> <li>○ Tessellation</li> <li>○ Congruence</li> <li>○ Construct Scale Drawings</li> <li>○ Measure and draw angles to the nearest 5 degrees using a protractor</li> <li>○ Create drawings or models representing specific measures</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Simplify algebraic expressions</li> <li>○ Represent and analyze relationships between dependent and independent variables.</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Communicate the results of a survey or experiment and use them to predict future results and make relevant decisions based on data gathered</li> <li>○ probability</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Fraction, decimal and percent relationships</li> <li>○ Order of operations</li> </ul> <p><b>Goal 7: Estimate and Measure</b> Circumference</p> <ul style="list-style-type: none"> <li>○ Weight, capacity, length, temperature, and time</li> <li>○ Perimeter, Area and volume</li> <li>○ Measure and draw angles</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Create, describe, and solve problems involving open sentences</li> <li>○ Solve multi-step problems involving</li> <li>○ Numbers, currency, fractions, decimals and percents</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Solve real-world and mathematical problems involving area, surface area, and volume</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Ratios and probability</li> <li>○ Explain the concept of “Sample”</li> <li>○ Analyze, predict, discuss, and defend possible outcomes, probability, and odds involving cards, dice and board games.</li> <li>○ Summarize and describe distributions</li> </ul>	<p>Algebra</p> <ul style="list-style-type: none"> <li>○ Emphasize algebraic thinking during fourth quarter.</li> </ul> <p><b>algebra</b></p> <ul style="list-style-type: none"> <li>○ Associative property</li> <li>○ equations</li> <li>○ expressions</li> <li>○ inequalities</li> <li>○ inverse relations</li> <li>○ linear equation</li> <li>○ number sentences</li> <li>○ pattern problems</li> <li>○ table of values</li> <li>○ unknown quantities</li> <li>○ variable</li> </ul>

**See the CPS Learning Targets (next page) for priorities for the year’s progress.**

## CPS Mathematics Learning Targets—SIXTH GRADE

By the end of Grade 6, students will:

### **Number Sense**

- Model, represent, interpret, and compare equivalent representations of numbers
- Solve problems involving characteristics and properties of number relationships and number systems and justify a mathematical concept or relationship
- Apply rules and properties of arithmetic and perform operations with numbers in problem-solving situations using estimation to approximate results
- Use proportional reasoning in solving problems

### **Measurement**

- Use *Measurement* units and *Measurement* tools appropriately
- Solve problems involving measurable attributes

### **Algebra**

- Represent and solve mathematical situations with expressions, equations, and inequalities
- Represent and solve mathematical situations with expressions, equations, and inequalities

### **Geometry**

- Identify, describe, and solve problems involving the characteristics and properties of 2-dimensional and 3-dimensional figures
- Identify, describe, and predict results of transformations of objects in the plane and on a coordinate system
- Recognize and determine attributes of, and relationships between, geometric figures

### **Data Analysis and Probability**

- Create, compare, and analyze data in a variety of representations
- Solve problems, make predictions, and use probability in problem solving situations

## 7<sup>th</sup> Grade Example of a Four-Quarter Math Framework

1st quarter	2nd quarter	3rd quarter	4th quarter
<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Rational numbers</li> <li>○ Percent</li> <li>○ Fractions decimals Equivalent fraction</li> <li>○ Ratios</li> <li>○ GCF, LCM</li> <li>○ Number expressions</li> <li>○ Analyze proportional relationships and use them to solve real-world and mathematical problems</li> <li>○ Order of operations</li> <li>○ Consumer application (discount/irrational numbers)</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Area, volume, weight, time</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Graph data</li> <li>○ Properties of numbers</li> <li>○ Linear equations</li> <li>○ Write algebraic expressions</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Frequency distributions</li> <li>○ Probability as a fraction or percent</li> <li>○ Permutations</li> <li>○ Combinations</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Inverse relationships (+, -, x, /)</li> </ul> <p><b>Goal 7: Estimate and measure</b></p> <ul style="list-style-type: none"> <li>○ Ordered pairs</li> <li>○ Proportional change</li> <li>○ Scale</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Variables</li> <li>○ Ordered pairs</li> <li>○ Coordinate plane</li> <li>○ Simplify algebraic expressions</li> <li>○ Use properties of operations to generate equivalent expressions</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Angles</li> <li>○ Parallel and perpendicular lines</li> <li>○ Congruence</li> <li>○ Geometric figures</li> <li>○ Solve real-life and mathematical problems involving angle measure, area, surface area, and volume</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Create and interpret graphs</li> <li>○ Mean, median, mode, range</li> <li>○ “best fit”</li> <li>○ Investigate chance processes and develop, use, and evaluate probability models</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Expanded notation</li> <li>○ Exponential notation</li> <li>○ Scientific notation</li> <li>○ Rational/irrational numbers</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Measurement</li> <li>○ Rate</li> <li>○ Area, volume, weight</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Evaluate expressions</li> <li>○ Patterns</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Collect, analyze data</li> <li>○ Draw conclusions</li> <li>○ Use random sampling to draw inferences about a population</li> <li>○ Draw informal comparative inferences about two populations</li> </ul>	<p>Algebra</p> <ul style="list-style-type: none"> <li>○ Emphasize algebraic thinking during fourth quarter.</li> </ul> <p><b>algebra</b> Represent, translate, and interpret relationships between equations and/or inequalities and graphs in the coordinate plane.</p> <ul style="list-style-type: none"> <li>○ Additive identity property</li> <li>○ Additive inverse property</li> <li>○ Associative property</li> <li>○ Balance</li> <li>○ Compound inequality</li> <li>○ Equations</li> <li>○ exponent</li> <li>○ expressions</li> <li>○ function</li> <li>○ inequalities</li> <li>○ inverse relations</li> <li>○ linear equation</li> <li>○ permutation</li> <li>○ prime factorization</li> <li>○ rational number</li> <li>○ scientific notation</li> <li>○ table of values</li> <li>○ variable</li> </ul> <p><b>Algebraic Thinking</b> Represent, simplify, and solve mathematical relationships and situations with expressions, equations, and inequalities.</p>

**See the CPS Learning Targets (next page) for priorities for the year’s progress.**

## CPS Mathematics Learning Targets—SEVENTH GRADE

By the end of Grade 7, students will:

### **Number Sense**

- Model, recognize, translate, and apply equivalent representations of numbers in meaningful contexts
- Solve problems involving characteristics and properties of numbers, relationships, and number systems and justify a mathematical concept or relationship
- Apply rules and properties of arithmetic and perform operations with rational numbers in problem-solving situations using estimation to approximate results
- Solve problems using proportional reasoning in problem situations

### **Measurement**

- Use *Measurement* units and *Measurement* tools in problem-solving
- Solve problems involving measurable attributes

### **Algebra**

- Identify a relationship and make generalizations from arithmetic or geometric sequences
- Represent, simplify, and solve mathematical relationships and situations with expressions, equations, and inequalities
- Represent, translate, and interpret relationships between equations and/or inequalities and graphs in the coordinate plane

### **Geometry**

- Describe, solve problems, and make and test conjectures involving the characteristics, properties, and relationships between geometric figures
- Identify, describe, and predict results of transformations of objects in the plane and on a coordinate system

### **Data Analysis and Probability**

- Create, compare, critique, interpret, and compute with data in a variety of representations
- Apply the measures of central tendency and spread in problem-solving situations
- Solve problems, make predictions, and use probability in problem-solving situations
- Solve problems involving permutations and combinations

## 8<sup>th</sup> Grade Example of a Four-Quarter Math Framework

1st quarter	2nd quarter	3rd quarter	4th quarter
<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Represent and use numbers in equivalent forms, percentages, repeating decimals</li> <li>○ Add, subtract, multiply, divide rational numbers, inverse relationships of math functions in equations</li> <li>○ LCM &amp; GCF</li> <li>○ Exponents and roots</li> <li>○ Consumer application (discount/irrational numbers)</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Measure area, length, volume, and surface area problems for geometric shapes, use appropriate units.               <ul style="list-style-type: none"> <li>▪ complementary angles</li> <li>▪ conversion</li> <li>▪ coordinate system</li> <li>▪ cube</li> <li>▪ estimate</li> <li>▪ isosceles trapezoid</li> <li>▪ line segment</li> <li>▪ mass/weight</li> <li>▪ measurable attributes</li> </ul> </li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Determine whether equations or data given in tables define functions</li> <li>○ Basic properties associative, commutative, orders of operations of real numbers, solve linear equations using addition, multiplication and inverse operations</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Compare real numbers using ratios and proportions</li> <li>○ Scientific notation</li> <li>○ Exponents and roots</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Vertices as ordered pairs to determine area and perimeter of polygon, change in linear dimensions of an object changes perimeter, compare Fahrenheit and Celsius</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Domain of independent variables, range of dependent variables, solve problems written as expressed, describe how change in one variable affects others</li> <li>○ Define, use, interpret linear relationships and represent them with graphs and equations.</li> <li>○ Translate algebraic expressions into phrases and sentences, graph inequalities</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Measures of central tendency, displaying data</li> <li>○ Analyze, predict, discuss possible outcomes, estimate probability from a series of trials</li> </ul>	<p><b>Goal 6: Numbers and Operations</b></p> <ul style="list-style-type: none"> <li>○ Rational and irrational numbers, square roots, relationships among subsets of real numbers</li> <li>○ Consumer applications problems, inductive and deductive reasoning, justify solutions for problems</li> </ul> <p><b>Goal 7: Estimate and Measure</b></p> <ul style="list-style-type: none"> <li>○ Draw models</li> <li>○ Use derived units and indirect methods for obtaining measures</li> </ul> <p><b>Goal 8: Algebra and Analytic Methods</b></p> <ul style="list-style-type: none"> <li>○ Analyze real world situations and patterns to see if linear or other simple relationships exist</li> <li>○ Define, evaluate, and compare functions</li> <li>○ Use functions to model relationships between quantities</li> </ul> <p><b>Goal 9: Geometry</b></p> <ul style="list-style-type: none"> <li>○ Understand and apply the Pythagorean Theorem</li> </ul> <p><b>Goal 10:</b></p> <ul style="list-style-type: none"> <li>○ Visualize and represent three dimensional objects in two dimensions</li> </ul>	<p><b>Algebra</b></p> <ul style="list-style-type: none"> <li>○ Additive identity property</li> <li>○ Additive inverse property</li> <li>○ Associative property</li> <li>○ Balance</li> <li>○ Compound inequality</li> <li>○ Equations</li> <li>○ exponent</li> <li>○ expressions</li> <li>○ function</li> <li>○ inequalities</li> <li>○ inverse relations</li> <li>○ linear equation</li> <li>○ permutation</li> <li>○ prime factorization</li> </ul>

**See the CPS Learning Targets (next page) for priorities for the year's progress.**

## CPS Mathematics Learning Targets—EIGHTH GRADE

By the end of Grade 8, students will:

### **Number Sense**

- Model, recognize, and translate among equivalent representations of numbers in meaningful contexts
- Represent, order, and compare rational and irrational numbers in meaningful contexts
- Apply rules and properties of arithmetic and perform operations with real numbers in problem-solving situations using estimation to approximate results
- Solve problems using proportional reasoning and relationships in problem-solving situations

### **Measurement**

- Use *Measurement* units and *Measurement* tools in problem-solving situations and determine accuracy of results
- Solve problems involving measurable attributes

### **Algebra**

- Identify a relationship, and make generalizations from linear or non-linear sequences in meaningful contexts
- Represent, simplify, and solve mathematical relationships and situations using expressions, equations, and inequalities
- Identify, interpret, represent, and solve functions in a coordinate system

### **Geometry**

- Visualize, describe, and solve problems involving the characteristics, properties, and relationships between geometric figures
- Identify, represent, describe, and predict results of transformations of objects in a plane and on a coordinate system

### **Data Analysis and Probability**

- Create, compare, and explain data displayed in a variety of representations
- Describe and use the measures of central tendency and spread in problem-solving situations
- Solve problems, make predictions, and use probability in problem-solving situations