



## Grade 4 Essential Understandings

Standards of Mathematical Practice emphasized through the year in grades K-5:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

### Grade 4 – Marking Period 1

At the start of the school year, students will extend their understanding of place value from 1,000 to 1,000,000. Relationships between the values of digits in different places are developed and used to compare and round numbers. Students will round out the marking period by beginning to shift their focus to a deep understanding of whole number algorithms for addition and subtraction. Additionally, they will begin the work on developing algorithms for multiplication and division.

*Examples include:*

Standard form: 618,249

Word form: six hundred eighteen thousand,  
two hundred forty-nine

Expanded form:  $600,000 + 10,000 + 8,000 +$   
 $200 + 40 + 9$

Calculate  $4 \times 325$ .

Break apart  $4 \times 325$ .

Use the Distributive Property.

$$4 \times 325 = (4 \times 300) + (4 \times 25)$$

Multiply mentally, and then add.

$$1,200 + 100 = 1,300$$

Calculate  $8 \times 25$ .

Break apart  $8 \times 25$ .

$$8 \times 25 = (4 \times 2) \times 25$$

Use the Commutative and Associative Properties to multiply.

$$(2 \times 4) \times 25 = 2 \times (4 \times 25)$$

Multiply mentally.

$$2 \times 100 = 200$$

Mathematical Focus	Topic Goals
<b>Whole Numbers</b>	Understand multi-digit place value to 1,000,000. Read, write, and represent multi-digit whole numbers in standard and expanded form and compare two multi-digit numbers using $<$ , $>$ , $=$ symbols. Round multi-digit whole numbers. Fluently add and subtract multi-digit numbers
<b>Multiplication and Division</b>	Multiply whole numbers using equations, rectangular arrays and/or area models ( $2 \times 1$ , $3 \times 1$ , and $4 \times 1$ multiplication)

## Grade 4 – Marking Period 2

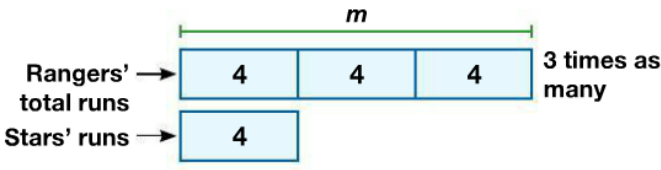
In marking period 2, students will continue their work on developing fluency with standard algorithms for multiplication and division. In topic 6 of enVision, students will shift their focus to solving word problems using the skills developed involving multi-digit whole-number addition, subtraction, multiplication, and division. As students solve word problems, they draw on previously learned meanings of the four operations, and they also come to understand a new meaning of multiplication: multiplication as comparison. Students will end the second marking period focusing on an understanding the meaning of factors and multiples by building

on their understanding of multiplication. The concepts of prime and composite number are also developed through connections to lesson on factors.

Examples include:

Max said the Rangers scored 3 times as many runs as the Stars. The Stars scored 4 runs. How many runs did the Rangers score?

Find 3 times as many as 4 runs.

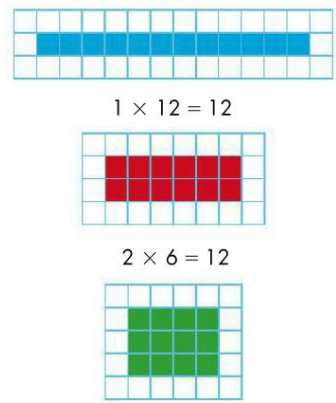


Rangers' total runs → 4 4 4 3 times as many

Stars' runs → 4

$m = 3 \times 4$   
 $m = 12$  runs

According to Max, the Rangers scored 12 runs.



$1 \times 12 = 12$

$2 \times 6 = 12$

$3 \times 4 = 12$

Factors of 12: 1, 2, 3, 4, 6, 12

Drawing all possible rectangles helps students see, for example, that a  $3 \times 4$  rectangle and a  $4 \times 3$  rectangle both show the same factors, 3 and 4.

Mathematical Focus	Topic Goals
<p><b>Multiplication and Division</b></p>	<p>Multiply whole numbers using equations, rectangular arrays and/or area models (2x2 multiplication)</p> <p>Interpret a multiplication equation as a comparison, example 35 is 5 times as many as 7.</p> <p>Find all factor pairs for whole numbers 1-100.</p> <p>Divide multi-digit dividends with one-digit divisors, including interpreting remainders (2x1, 3x1, and 4x1 division).</p> <p>Solve multi-step word problems using the four operations. Problems will include interpreting a remainder and/or using equations with a letter standing for the unknown.</p>

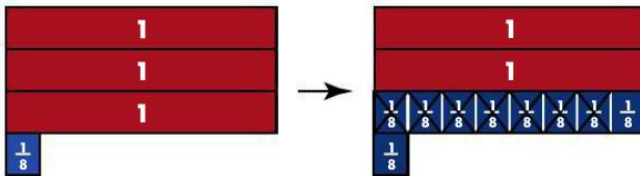
## Grade 4 – Marking Period 3

In the third marking period, students will focus on recognizing and generating equivalent fractions and on comparing fractions with different numerators and different denominators. This deep understanding of fraction equivalence and comparison provides a foundation for further work with fraction operations which will include adding and subtracting fractions with like denominators and multiplying fractions by whole numbers. In the latter half of the marking period students will explore line plots, specifically how to read and make them. This skill is important as line plots show data that serve as context for solving real world problems involving fractions and missed numbers. Finally, students will focus on developing an understanding of decimals and decimal notation. They will be challenged to use reasoning to compare decimals and to use their understanding of equivalent fractions to rewrite a fraction written in tenths as a fraction written in hundredths.

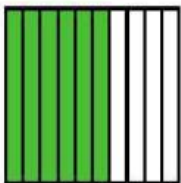
*Examples include:*

Adding and Subtracting fractions with the use of visual models.

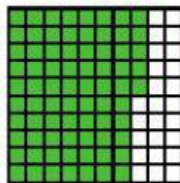
$$\begin{array}{r} 3\frac{1}{8} = 2 + \frac{8}{8} + \frac{1}{8} = 2\frac{9}{8} \\ -\frac{7}{8} = \phantom{2} + \frac{7}{8} = \phantom{2}\frac{7}{8} \\ \hline 2\frac{2}{8} \end{array}$$



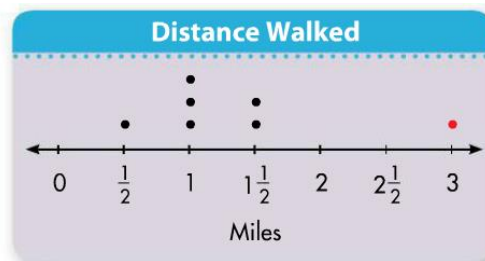
Decimals and line plots.



$$\frac{6}{10} = \frac{3}{5}$$

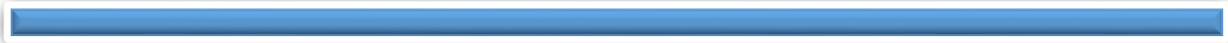


$$\frac{75}{100} = 0.75$$



The dot above 3 is far away from the other dots on the line plot.

Mathematical Focus	Topic Goals
<b>Fractions</b>	<p>Understand equivalent fractions.</p> <p>Compare fractions with symbols <math>&lt;</math>, <math>&gt;</math>, <math>=</math>.</p> <p>Add and subtract fractions with like denominators. Decompose a fraction into a sum of fractions with the same denominator in more than one way (example: <math>\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}</math>; <math>\frac{3}{8} = \frac{1}{8} + \frac{2}{8}</math>; <math>2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}</math>)</p> <p>Add and subtract fractions, including mixed numbers with like denominators.</p> <p>Add and subtract fractions to solve word problems. Understand a fraction is a multiple of a unit fraction. Ex: <math>\frac{5}{4}</math> as the product of <math>5 \times \frac{1}{4}</math>.</p> <p>Understand a multiple of <math>\frac{a}{b}</math> as a multiple of <math>\frac{1}{b}</math>, and use this understanding to multiply a fraction by a whole number. (Ex: understand <math>3 \times \frac{2}{5}</math> as <math>6 \times \frac{1}{5}</math>). Multiply a fraction by a whole number to solve problems.</p> <p>Add and subtract fractions on a line plot.</p>
<b>Measurement and Data</b>	<p>Use the four operations to solve word problems involving distances, intervals of time, and money.</p> <p>Make a line plot to display a data set of measurements in fractions of a unit.</p>
<b>Decimals</b>	<p>Use decimal notation for fractions with denominators 10 or 100. (Ex: rewrite 0.62 as <math>\frac{62}{100}</math>; describe a length as 0.62 meters; locate 0.62 on a number line diagram)</p> <p>Compare two decimals to hundredths by reasoning about their size.</p>



## Grade 4 – Marking Period 4

In the last marking period, students will focus on converting measurements from larger to smaller units within one system of measurement. These measurements involve customary units of length, capacity, weight, and time as well as metric units of length, capacity, and mass. Students will also solve real-world problems involving rectangles by applying area and perimeter formulas. Students will also focus on patterns and rules using addition, subtraction, multiplication and division rules. They will examine terms of the patterns and describe the features they observe.

Lastly, students will develop a deep understanding of angle concepts and angle measurement as well as how shapes can be analyzed, described and classified using the properties of sides, angles, and lines of symmetry.

Examples include:

**Another Example!**  
 Convert 6 yards to inches. There are 12 inches in 1 foot, and there are 3 feet in 1 yard.

$$12 \times 3 = 36$$


There are 36 inches in 1 yard.

$$6 \times 36 = 216 \text{ inches}$$

↑      ↑  
 Number of yards    Inches per yard

There are 216 inches in 6 yards.

You need to find how many smaller units are in a number of larger units. Then, multiply the number of larger units by the number of smaller units in each larger unit.




**B How many leaflets are on 4 cloverleaves?**

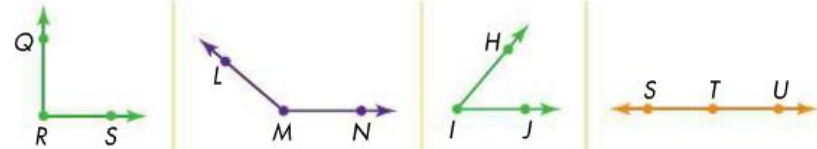
Rule: Multiply by 3

Number of Cloverleaves	Number of Leaflets
1	3
2	6
3	9
4	12

There are 12 leaflets on 4 cloverleaves. The number of leaflets is a multiple of the number of cloverleaves.

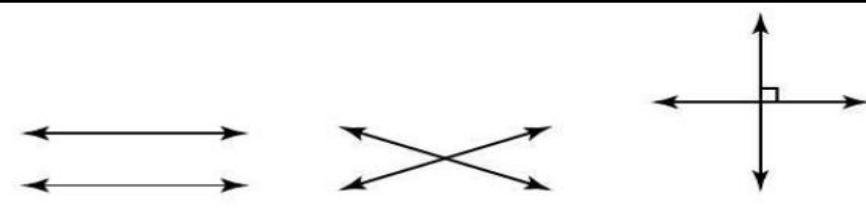


**Properties of angles:**



Right angle      Obtuse angle      Acute angle      Straight angle

Students will consider the relationships between lines.



**Parallel lines** never intersect.

**Intersecting lines** pass through the same point.

**Perpendicular lines** are lines that intersect to form right angles.

Mathematical Focus	Topic Goals
<b>Measurement and Data</b>	Convert equivalent measurements in the same measurement system (Ex: 12 in = 1 ft) Solve measurement word problems with distance, time, liquid volumes, masses of objects, and money. Apply area and perimeter formulas for rectangles.
<b>Geometry</b>	Identify and draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines in 2-dimensional figures. Measure and draw angles. Classify 2-dimensional figures by parallel/perpendicular line segments and angles. Understand line of symmetry for 2-dimensional figures.
<b>Patterns</b>	Understand and generate patterns with numbers or shapes.