1,063 feet

25 meters

36 ft²

55°

Simply Good and Beautiful MATH 4

COURSE BOOK

Created by the Simply Good and Beautiful Math Team

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The Good and the Beautiful CURRICULUM

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ABOUT THE COURSE

Supplies Needed

- *Simply Good and Beautiful Math 4 Course Book*
- *Simply Good and Beautiful Math 4 Answer Key*
- *Math 4 Mental Math Map Mysteries*
- *Simply Good and Beautiful Math Scratch Pad* or other scratch paper
- Device to access videos (highly recommended)
- Pencils
- Crayons or colored pencils (keep on hand)
- 12-inch ruler
- Dice

Course Overview

Math 4 consists of 120 lessons divided into four units. Each unit ends with an assessment. The course is designed to be completed by the child independently, but parents/teachers can choose to be as involved in the lessons as they would like to be.

Lesson Overview

Most lessons are 3–4 pages and consist of four parts: video lesson, mini lesson, lesson practice, and review.

Video Lesson: Themed videos provide detailed teaching and interactive guided practice of the lesson topic. Scan the QR code or go to goodandbeautiful.com/Math4 to access the videos.

Mini Lesson: A concise written lesson on the topic.

Lesson Practice: Practice that is dedicated to the lesson topic.
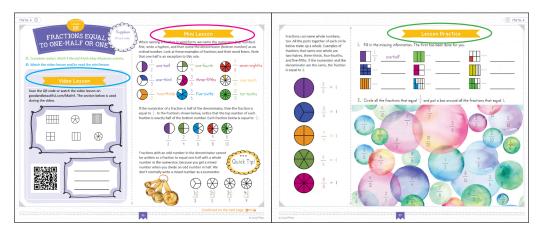
Review: Daily review of topics from previous lessons, including daily review of multiplication facts.
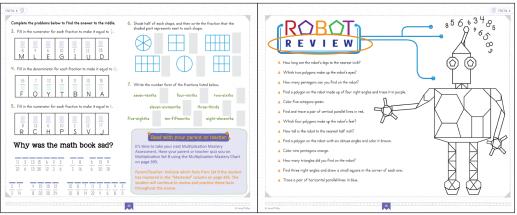
A Reference Guide is included at the end of the course book.

Getting Started

Simply open the course book. Students may choose to watch the video lesson or to read just the mini lesson. Please note that videos may contain material not included in the written mini lesson. After completing the video and/or mini lesson, the student should complete the lesson practice and review sections. Parents/teachers should grade their child's work daily and provide immediate help and feedback. Students who struggle with the lesson practice should be encouraged to review the mini lesson or the video for help.

Students should complete one section in their *Math 4 Mental Math Map Mysteries* book each time they complete a math lesson.

Frequently Asked Questions

How many lessons should my student do each week?

- There are 120 lessons in the course. If your student completes four lessons per week, he or she will complete the course in a standard school year with typical breaks for vacation or sickness.

How long do lessons take?

- The average time to complete a lesson is 35–45 minutes. This includes time to watch the video, complete the practice and review sections, and practice multiplication facts.

What if my child is too slow/fast?

- If your child takes longer than average but is understanding and retaining information, don't worry. You may want to break up the lessons. Complete the video and lesson practice at one time and the review section at another time.
- To avoid holes in his or her math foundation, we suggest not skipping entire levels if your child works more quickly than average but is learning new concepts. Consider having your child do multiple lessons a day to complete the course faster.
- If your child takes less time than average and seems to already know all the information, consider giving the Unit Assessments to see if he or she can skip any units or move on to the next course. Remember, the first few lessons of the course are review from Math 3, and it's expected that most students will know the information already.

What if my child cannot remember concepts?

- In the back of the course book is a reference guide. This page may be useful for your student to refer to as he or she is completing difficult concepts that require memorizing information such as conversions, volume, perimeter, area, long division, etc.

Does my student have to watch the videos?

- The videos contain the bulk of the teaching and are highly recommended. However, if your student feels confident in the topic being taught, he or she can skip the video and read the mini lesson instead. A student who struggles with the lesson practice should be encouraged to go back and watch the video.
- Some families prefer to have the parent/teacher teach the child using the mini lesson rather than have the child watch the video lesson independently.

Is Math 4 completed independently by the child?

- Yes, Math 4 is designed for your student to mostly complete independently, though at times children may need parent/teacher assistance to understand a concept. Parents/teachers will need to grade their child's work and should do so on a daily basis when possible, providing immediate feedback.

Is Math 4 a spiral or mastery program?

- Math 4 is mainly a spiral course, constantly reviewing concepts your student has learned to ensure understanding and retention of information.

What if there isn't room to complete the work?

- Students should always keep scratch paper on hand while completing the lessons. The *Simply Good and Beautiful Math Scratch Pad* is available for purchase.

Do you include any specific doctrine?

- No, the goal of our curriculum is not to teach doctrines specific to any particular Christian denomination but to teach general principles such as honesty, hard work, and kindness. All Bible references in our curriculum use the King James Version.

LESSONS 1-30

Extra Supplies Needed

- ruler
- colored pencils or crayons

New Concepts Taught

- commutative property of multiplication
- compare numbers through hundred millions
- estimations (sums and differences)
- measurement to a quarter inch
- order numbers through hundred millions

Parent/Teacher Tips

The first several lessons in this unit review foundational concepts that students should have mastered in previous math levels. It is expected and appropriate that these lessons will be fairly easy for the child. These lessons may be finished in much less time than the lesson average.

Concepts Reviewed and Expanded Upon

- addition (three or more addends)
- addition/subtraction (multi-digit, money)
- angle classifications
- commutative property of addition
- conversion (units of length)
- division (arrays, equal groups)
- elapsed time beyond 1 hour
- expanded form through hundred millions
- fact families and inverse operations
- fractions and mixed numbers
- fractions equal to one-half and one
- geometric figures and polygons
- mental math (addition and subtraction)
- multiplication
- number patterns
- place value through billions
- round whole numbers to billions
- scales
- solving for unknowns
- subtraction across zeros
- time

Multiplication Mastery in Math 4

Action Item
Get one or more of the resources in green to prepare for Lesson 5.

Why

Many topics taught in Math 4 depend on a solid understanding of multiplication facts. Multiplication is a core, foundational math topic. It can be very frustrating trying to master certain subjects, like those listed below, without first having your multiplication facts memorized.

Area	Measurement Conversions
Fractions	Division
Factors	Prime/Composite Numbers

In Math 4 you will practice all of your multiplication facts. Because they are easy to understand and master, the 1s, 2s, 10s, and 11s facts are not included in our multiplication practice resources (listed on the right), and they are not included in the mastery charts. However, they are practiced in lessons and reviews. In Units 1 and 2, you will work on mastering two sets of multiplication facts per unit.

How

If the student has not mastered all the multiplication facts, please provide him or her with one or more of the resources below. The course book will guide the student through the process of practicing, testing, mastering, and reviewing multiplication facts while using these resources.

Musical Multiplication

Available for purchase at goodandbeautiful.com.

Good and Beautiful Multiplication Flashcards

A PDF is available for free at goodandbeautiful.com. (Go to the Math 4 product page, and then click on "FAQs, Helps & Extras.") Physical copies are also available for flashcards.

Each of the resources in green in the right column above divides multiplication into four sets.

SET A: 3×3, 6×6, 5×3, 8×4, 8×8, 3×4, 5×5, 9×9, 6×4

SET B: 4×4, 4×5, 7×3, 7×4, 8×5, 8×7, 9×3, 9×4, 9×5

SET C: 5×6, 5×7, 6×3, 6×8, 7×6, 7×7, 7×9, 8×3, 9×6, 9×8

SET D: 12×3, 12×4, 12×5, 12×6, 12×7, 12×8, 12×9, 12×11, 12×12

When Each Set Should Be Mastered

You will practice and review all facts throughout the entire course.

SET A: Memorize before the end of Unit 1

SET B: Memorize before the end of Unit 1

SET C: Memorize before the end of Unit 2

SET D: Memorize before the end of Unit 2

You may be wondering why the times tables are not mastered together (such as all the 4s at one time). While skip counting is a great concept and one we teach, we have found that mixing up the times tables helps the child rely, not on skip counting, but on memorization, which is a faster process.

Lesson 13

RAYS AND ANGLES

📖 Complete today's *Math 4 Mental Math Map Mysteries* activity.

📖 Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4. The section below is used during the video.
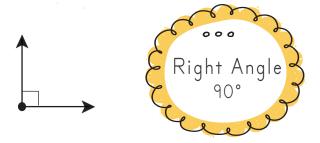
Mini Lesson
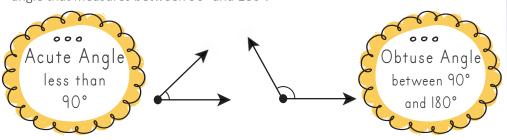
A **ray** is a geometric figure that is part of a line that has one endpoint and continues on forever.
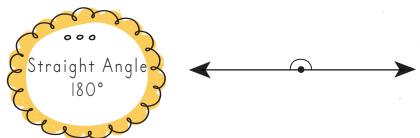
An **angle** is formed by two line segments or rays that have a common endpoint. We use degrees to measure an angle. A **right angle** is an angle that measures 90°, which creates a square corner.

Right Angle 90°

An **acute angle** is an angle that measures less than 90°, and an **obtuse angle** is an angle that measures between 90° and 180°.

Acute Angle less than 90°

Obtuse Angle between 90° and 180°

A **straight angle** is an angle that measures 180°.

Straight Angle 180°
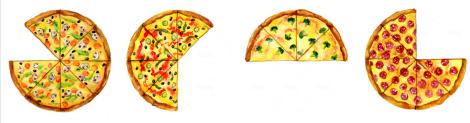
1. Name each type of angle.

_____   _____   _____   _____

2. What type of angle is formed by the missing slices of pizza?

_____   _____   _____   _____

3. Below are the measurements for six different angles. Based on the measurement, determine which type of angle is being formed and draw a line to it. Angle names can be used more than once.

38°
90°
127°
74°
180°
169°

acute

obtuse
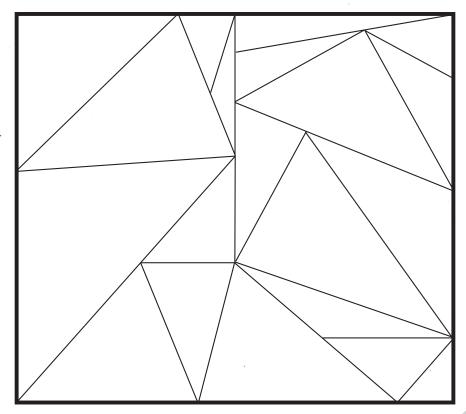
right

straight

Triangle Angles

Locate a triangle in the design. If the triangle has a right angle (90°), color it **BLUE.** If the triangle has an obtuse angle (between 90° and 180°), color it **YELLOW**. If the triangle has only acute angles (less than 90°), color it **RED**. Repeat for all the triangles.

Hint: An easy way to tell the type of angle is to use the corner of a piece of paper. If the corner fits into the angle perfectly, it's a right angle; if the angle is narrower than the corner, it's an acute angle; and if it's wider, it's an obtuse angle.

Review

1. Complete the following problems using mental math strategies.

$$14 \qquad 28 \qquad 64 \qquad 51 \qquad 72$$
$$+ 38 \qquad + 43 \qquad + 31 \qquad + 45 \qquad + 27$$
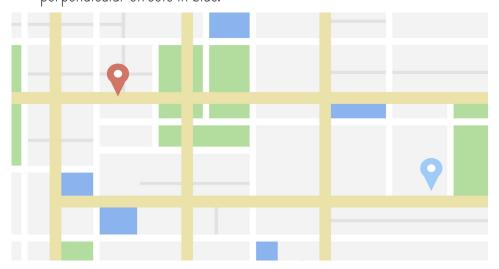
2. Circle the digit in the thousands place, and then write the number in expanded form.

54,267

7,654

37,005

3. On the map below, trace a pair of horizontal parallel streets in red. Trace a pair of vertical parallel streets in yellow. Trace a pair of perpendicular streets in blue.

4. Write a division equation for this array.

5. Complete the problems.

$$6\ 0\ 9 \qquad 4\ 7\ 2 \qquad 8\ 7\ 2 \qquad 3\ 4\ 2$$
$$-\ 3\ 7\ 1 \qquad -\ 2\ 7\ 4 \qquad -\ 5\ 3\ 1 \qquad -\ \ \ 8\ 1$$

🎯 Targeted Multiplication Fact Practice 🎯

Practice any problems you missed in your Set A quiz in Lesson 11. Then complete the problems in this section.

$$8 \qquad 3 \qquad 4 \qquad 9 \qquad 5 \qquad 8 \qquad 5$$
$$\times 4 \quad \times 3 \quad \times 6 \quad \times 9 \quad \times 3 \quad \times 8 \quad \times 5$$

$$1 \qquad 3 \qquad 4 \qquad 8 \qquad 0 \qquad 6 \qquad 6$$
$$\times 2 \quad \times 4 \quad \times 8 \quad \times 10 \quad \times 0 \quad \times 6 \quad \times 4$$
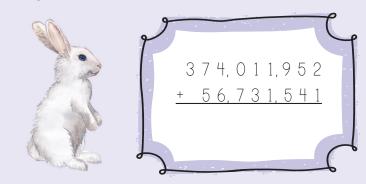
ADDING AND ROUNDING TO ANY PLACE VALUE

⚠ Complete today's *Math 4 Mental Math Map Mysteries* activity.

⚠ Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4. The section below is used during the video.

$$374,011,952 + 56,731,541$$

$$6,438,734,169$$
Round to nearest billion.

Mini Lesson

Addition to Any Place Value

When adding large numbers, we follow the same steps we use when adding small numbers. To complete an addition problem, follow these steps:

① Write the numbers vertically. Remember to line up the place values correctly.

② Add the digits in each place value, starting with the ones place on the far right.

③ If the sum is a two-digit number, REGROUP. Write the digit in the ones place under the line. Write the digit in the tens place above the column immediately to the left.

$$562,901,872 + 28,089,430 \rightarrow $$
$$\overset{1}{562,901,872} + 28,089,430 = 02 \rightarrow$$
$$\overset{11}{562,901,872} + 28,089,430 = 302 \rightarrow$$
$$\overset{1111}{562,901,872} + 28,089,430 = 590,991,302$$

Rounding to Any Place Value

Remember that rounding is replacing a number with a number close in value that is simpler to work with.

5 or greater, round up!

4 or less, round down!

When rounding to any place value, follow these steps:

1. Locate the digit in the place value you want to round to and underline it.
2. Circle the digit to the right.
3. Decide which rule the circled digit follows and change the underlined digit if necessary.
4. Replace the circled digit and all digits to the right with zeros.

The number below is shown rounded to different place values. The rounding strategy can be used to round a number to any place value.

Rounded to

1,576,379,471

the nearest 10,000	the nearest 100,000	the nearest 1,000,000	the nearest 10,000,000	the nearest 100,000,000	the nearest 1,000,000,000
1,576,380,000	1,576,400,000	1,576,000,000	1,580,000,000	1,600,000,000	2,000,000,000

Lesson Practice

1. Complete the addition problems.

487,675,012	8,241,765,132	219,518,264
+ 47,917,075	+ 684,179,542	+ 34,504,335

KOALA COUNTDOWN

PLATYPUS	381,957
ECHIDNA	307,165,195
DINGO	36,942
WOMBAT	23,671,498
KOOKABURRA	1,655,954,203
KANGAROO	49,827,590
KOALA	73,941

2. How many koalas and platypuses are there altogether? Show your work in the box to the right.

3. How many echidnas are there, rounded to the nearest million?

4. How many kookaburras are there, rounded to the nearest hundred million?

5. Which animal has a population of fifty million when rounded to the nearest ten million?

6. When added together, are there more kangaroos and dingoes or wombats and platypuses?

7. Using the chart, come up with your own addition problem and have your parent or teacher complete it.

Review

1. At 8:38 AM you started your math homework, and you finished at 10:45 AM. How long did it take you?

2. Once you finished your math homework, you started reading a book for history. You read until 12:05 PM. How long did you read?

3. Use mental math strategies to find the answers.

46 - 22 =   84 - 57 =   32 - 15 =

4. Divide and shade each shape to match the fraction listed.

$\frac{6}{8}$ ◯ $\frac{2}{5}$ ▢ $\frac{2}{2}$ ◯ $\frac{1}{4}$ ▭

5. Draw a line of symmetry through each polygon. Which polygons have more than one line of symmetry? _____

✦Multiplication Fact Practice✦

Practice Set B for 10 minutes.
Then complete the problems.

8	9	5	8	4	4	3	8	4	7
× 8	× 4	× 8	× 4	× 9	× 7	× 7	× 5	× 4	× 4

8	9	3	7	5	9	4	9	5	7
× 7	× 5	× 9	× 8	× 9	× 3	× 5	× 9	× 4	× 3

Lesson 23

READING A RULER AND INCH SCALE

📗 Complete today's *Math 4 Mental Math Map Mysteries* activity.

📘 Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com /Math4. The section below is used during the video.

Mini Lesson
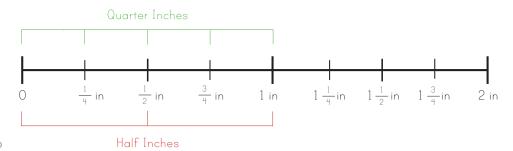
A scale is a number line that can be used for measuring. Many tools have scales, but in this lesson, we will focus on a scale used for measuring length: a ruler. Rulers in the US are usually 12 inches long. Twelve inches is equal to one foot. Inches and feet are two of the units of length in the US customary system.
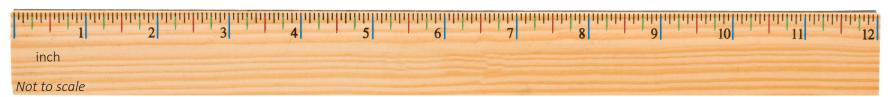
12 inches = 1 foot

To read this ruler, we must understand how to read an inch scale. Inch scales have tick marks showing each inch and fractions of an inch. These tick marks allow us to measure to the nearest inch, half inch, quarter inch, eighth inch, and sixteenth inch. At this level we will only measure to the nearest inch, half inch, and quarter inch. A half inch is $\frac{1}{2}$ of an inch, and a quarter inch is $\frac{1}{4}$ of an inch.

Quarter Inches

0 $\frac{1}{4}$ in $\frac{1}{2}$ in $\frac{3}{4}$ in 1 in $1\frac{1}{4}$ in $1\frac{1}{2}$ in $1\frac{3}{4}$ in 2 in

Half Inches

On the ruler below, each inch, starting at 0, is marked with a blue tick mark. Half inches are marked with a red tick mark. Each whole-inch tick mark is also a half-inch tick mark ($1 = \frac{2}{2}$); therefore, each blue tick mark also represents a half inch. Quarter inches are marked with a green tick mark. Each whole-inch tick mark and half-inch tick mark is also a quarter inch ($\frac{1}{2} = \frac{2}{4}$ and $1 = \frac{4}{4}$); therefore, each red tick mark and blue tick mark also represents a quarter inch. When reading measurements, we say the fraction part in the simplest way. For example, for each half-inch tick mark, we say one-half rather than two-fourths. We also say one instead of two-halves or four-fourths.

inch

Not to scale

If we measure this pencil to the nearest **inch**, we look at the end of the pencil and determine which whole-inch tick mark is closest. The pencil is between 7 and 8 inches. It is closer to 7 inches because the end of the pencil is between 7 inches and $7\frac{1}{2}$ inches.

If we measure this pencil to the nearest **half inch**, we look at the end of the pencil and determine which half-inch tick mark is closest. This pencil is closer to the $7\frac{1}{2}$ inch mark because it is past the halfway point between 7 inches and $7\frac{1}{2}$ inches.

If we measure this pencil to the nearest **quarter inch**, we look at the end of the pencil and determine which quarter-inch tick mark is closest. This pencil is closest to $7\frac{1}{4}$ inches.

Measured to the nearest

Inch: **7** inches
Half inch: **$7\frac{1}{2}$** inches
Quarter inch: **$7\frac{1}{4}$** inches

Lesson Practice

1. On the ruler below, trace the inch lines in blue, the half-inch lines in red, and the quarter-inch lines in green.

2. Using the ruler above, measure the length of the crayon to the following units:

Nearest inch _____   Nearest half inch _____

3. Find an object in your house that measures between 5 and 9 inches. Show your parent or teacher and write the name of the object and its measurement.

4. A line segment is named by its two endpoints.

A ●————————● B   This is line segment AB or BA. We write it like this: $\overline{AB}$ or $\overline{BA}$.
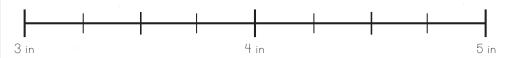
C ●————————● D   What is the name of this line segment?

5. Using a 12-inch ruler, measure the following line segments on the line below to the nearest quarter inch.

$\overline{AE}$ [____]
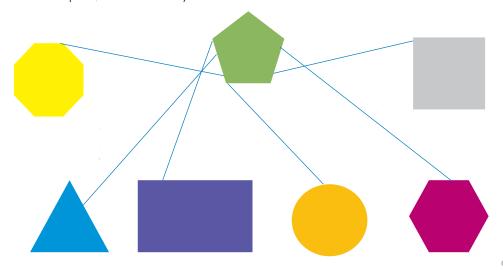
Hint: Put the first line of your ruler on point A and measure the distance between point A and point E.

$\overline{BD}$ [____] $\overline{CE}$ [____] $\overline{AB}$ [____]

A   B   C   D   E
●————●—————————●——————————●———●

6. Label the inch scale below with the missing half-inch and quarter-inch measurements.

3 in   4 in   5 in

7. Measure each line segment from the pentagon to the other shapes to the nearest quarter inch. Write the measurement on each line. Which shape is farthest away?

HOW TALL ARE YOU ?

Today, you will try an interesting activity to estimate your height in inches. First, you will need to carefully trace your hand on the next page.

Use your ruler to measure your hand from the very bottom of your hand to the top of your middle finger, to the nearest inch.

To find out your approximate height, multiply the length of your hand by 10.

Hand = ____ inches × 10 =
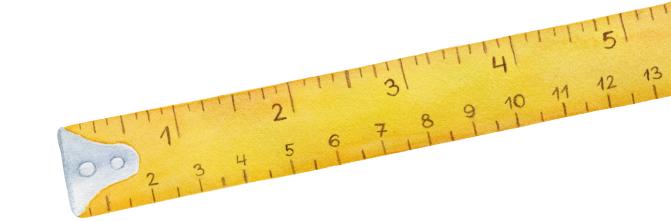
Since we are rounding to the nearest inch, your height will be an estimate and not an exact measurement. Do you want to get an even closer estimate to your actual height? Try measuring your hand to the nearest half inch or quarter inch and multiplying it by 10. Use a calculator if you need help.

☑ **Multiplication Fact Quiz** ☑   Have your parent or teacher quiz you on the Set B multiplication facts below and circle any facts you missed. You will be doing targeted practice on these facts for the next few lessons.

4	4	7	7	8	8	9	9	9	5	4	3	5	5	4	3	7
× 4	× 5	× 3	× 4	× 5	× 7	× 3	× 4	× 5	× 4	× 9	× 7	× 8	× 9	× 7	× 9	× 8
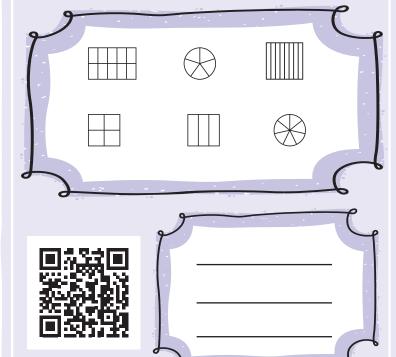
All done! No review.

Trace Your Hand

Lesson 28

FRACTIONS EQUAL TO ONE-HALF OR ONE
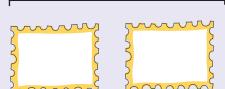
△ Complete today's *Math 4 Mental Math Map Mysteries* activity.
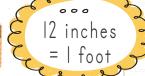
△ Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4. The section below is used during the video.

Mini Lesson

When naming a fraction in word form, we name the numerator (top number) first, write a hyphen, and then name the denominator (bottom number) as an ordinal number. Look at these examples of fractions and their word forms. Note that one-half is an exception to this rule.

$\frac{1}{2}$ one-half $\frac{1}{4}$ one-fourth $\frac{7}{8}$ seven-eighths

$\frac{1}{3}$ one-third $\frac{3}{5}$ three-fifths $\frac{1}{10}$ one-tenth

$\frac{2}{3}$ two-thirds $\frac{5}{6}$ five-sixths $\frac{10}{10}$ ten-tenths
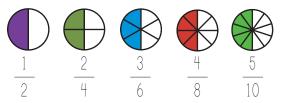
If the numerator of a fraction is half of the denominator, then the fraction is equal to $\frac{1}{2}$. In the fractions shown below, notice that the top number of each fraction is exactly half of the bottom number. Each fraction below is equal to $\frac{1}{2}$.

$\frac{1}{2}$ $\frac{2}{4}$ $\frac{3}{6}$ $\frac{4}{8}$ $\frac{5}{10}$

Fractions with an odd number in the denominator cannot be written as a fraction to equal one-half with a whole number in the numerator, because you get a mixed number when you divide an odd number in half. We don't normally write a mixed number as a numerator.

Quick Tip!

$\frac{1\frac{1}{2}}{3}$ $\frac{2\frac{1}{2}}{5}$ $\frac{3\frac{1}{2}}{7}$ $\frac{4\frac{1}{2}}{9}$
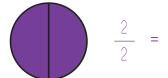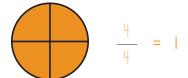
Fractions can name whole numbers, too. All the parts together of each circle below make up a whole. Examples of fractions that name one whole are two-halves, three-thirds, four-fourths, and five-fifths. If the numerator and the denominator are the same, the fraction is equal to 1.

$\dfrac{2}{2} = 1$

$\dfrac{3}{3} = 1$

$\dfrac{4}{4} = 1$

$\dfrac{6}{6} = 1$

$\dfrac{8}{8} = 1$

Lesson Practice
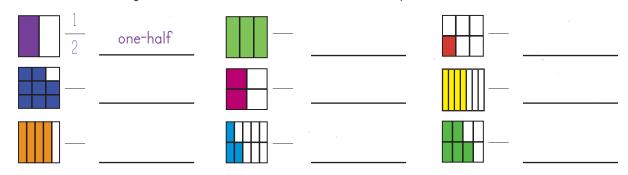
I. Fill in the missing information. The first has been done for you.

$\dfrac{1}{2}$ ___one-half___

_____

_____

_____

_____

_____

_____

_____

_____

2. Circle all the fractions that equal $\dfrac{1}{2}$ and put a box around all the fractions that equal 1.

$\dfrac{6}{12}$ $\dfrac{2}{2}$ $\dfrac{7}{12}$

$\dfrac{7}{7}$ $\dfrac{5}{5}$ $\dfrac{5}{10}$

$\dfrac{1}{2}$ $\dfrac{3}{6}$

$\dfrac{3}{4}$ $\dfrac{3}{10}$

$\dfrac{2}{5}$ $\dfrac{10}{20}$ $\dfrac{1}{6}$

$\dfrac{3}{3}$ $\dfrac{3}{8}$

$\dfrac{6}{7}$ $\dfrac{1}{2}$ $\dfrac{4}{5}$

$\dfrac{8}{16}$ $\dfrac{2}{6}$ $\dfrac{8}{8}$

$\dfrac{4}{12}$ $\dfrac{2}{4}$

$\dfrac{4}{8}$ $\dfrac{2}{2}$ $\dfrac{1}{5}$ $\dfrac{7}{8}$ $\dfrac{2}{3}$ $\dfrac{5}{9}$

Complete the problems below to find the answer to the riddle.

3. Fill in the numerator for each fraction to make it equal to $\frac{1}{2}$.

$\frac{\square}{8}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{10}$	$\frac{\square}{2}$	$\frac{\square}{12}$	$\frac{\square}{18}$
M	L	E	G	I	U	D

4. Fill in the denominator for each fraction to make it equal to $\frac{1}{2}$.

$\frac{16}{\square}$	$\frac{7}{\square}$	$\frac{12}{\square}$	$\frac{8}{\square}$	$\frac{11}{\square}$	$\frac{10}{\square}$	$\frac{15}{\square}$
F	O	Y	T	B	N	A

5. Fill in the numerator for each fraction to make it equal to 1.
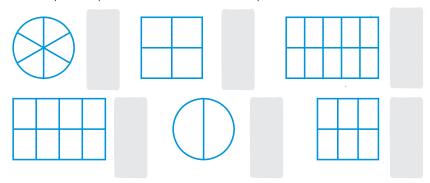
$\frac{\square}{8}$	$\frac{\square}{13}$	$\frac{\square}{6}$	$\frac{\square}{10}$	$\frac{\square}{2}$	$\frac{\square}{12}$	$\frac{\square}{17}$
R	C	H	P	S	V	J

Why was the math book sad?
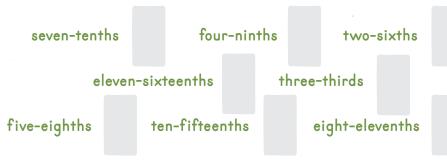
___ ___ ___ ___ ___ ___ ___   ___ ___   ___ ___ ___

$\frac{11}{22}$ $\frac{3}{6}$ $\frac{13}{13}$ $\frac{15}{30}$ $\frac{6}{12}$ $\frac{2}{2}$ $\frac{3}{6}$ $\frac{1}{2}$ $\frac{8}{16}$ $\frac{6}{6}$ $\frac{15}{30}$ $\frac{9}{18}$

___ ___   ___ ___ ___ ___   ___ ___ ___ ___ ___ ___ ___ ___

$\frac{2}{2}$ $\frac{7}{14}$ $\frac{4}{8}$ $\frac{15}{30}$ $\frac{10}{20}$ $\frac{12}{24}$ $\frac{10}{10}$ $\frac{8}{8}$ $\frac{7}{14}$ $\frac{11}{22}$ $\frac{2}{4}$ $\frac{3}{6}$ $\frac{4}{8}$ $\frac{2}{2}$

6. Shade half of each shape, and then write the fraction that the shaded part represents next to each shape.

7. Write the number form of the fractions listed below.
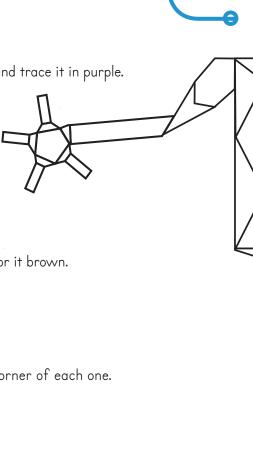
seven-tenths   four-ninths   two-sixths

eleven-sixteenths   three-thirds

five-eighths   ten-fifteenths   eight-elevenths

ROBOT REVIEW

▲ How long are the robot's legs to the nearest inch?

▲ Which two polygons make up the robot's eyes?

▲ How many pentagons can you find on the robot?

▲ Find a polygon on the robot made up of four right angles and trace it in purple.

▲ Color five octagons green.

▲ Find and trace a pair of vertical parallel lines in red.

▲ Which four polygons make up the robot's feet?

▲ How tall is the robot to the nearest half inch?

▲ Find a polygon on the robot with six obtuse angles and color it brown.

▲ Color nine pentagons orange.

▲ How many triangles did you find on the robot?

▲ Find three right angles and draw a small square in the corner of each one.

▲ Trace a pair of horizontal parallel lines in blue.

UNIT ASSESSMENT

LESSONS 29-30
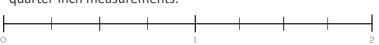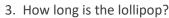
Supplies
12-inch ruler

Parent/Teacher

✎ **Read the following information aloud to the child**: Unit assessments give you practice with the mathematical concepts learned in this course without having you overpractice concepts that you have mastered. These assessments also give you practice working on exercises for an extended period of time. This helps you to extend your focus and attention span and to be better prepared for any type of testing you will have to do in the future.

✎ Here are some tips. First, make sure to read the instructions carefully. Sometimes you can get answers wrong simply because you did not understand the instructions. Second, do not rush through exercises you think you already know. Instead, make sure to do your work carefully. And finally, if you feel you are having trouble focusing, take a quick break to do something else, like ten jumping jacks. There are no videos for Lessons 29–30.

✎ For Lesson 29 complete all the exercises with PURPLE headers ONLY. Your parent or teacher will correct the work. If you make one or more mistakes in a section, your parent or teacher will check the orange "Additional Practice" checkbox for that section.

✎ For Lesson 30 complete all the orange sections **that are checked**. If you still miss multiple problems, go back and rewatch the video or reread the mini lesson for that topic. All the principles will be reviewed again in future units. If you have only a few or no orange sections to practice, you may move on to the next unit.

Student
READING SCALES & MEASURING
(LESSON 23)

1. Label the inch scale below with the missing half-inch and quarter-inch measurements.
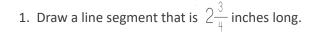
2. Measure this line segment to the nearest quarter inch.

3. How long is the lollipop?

Additional Practice

1. Draw a line segment that is $2\frac{3}{4}$ inches long.

2. Measure the following line segment to the nearest inch.

3. Find an object in your house that measures between 3 inches and 4 inches. Show it to your parent or teacher.

90

© Jenny Phillips

Additional Practice

Label each clock with the type of angle formed by its hands.
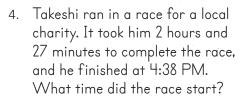
ELAPSED TIME
(LESSONS 18 & 25)

1. At 7:24 AM you started your math lesson. At 8:48 AM you finished the last problem. How long did the lesson take you to complete?

2. Next, you started working on your science project. You started at 9:12 AM, and it took 2 hours and 7 minutes to complete. What time did you finish your science project?
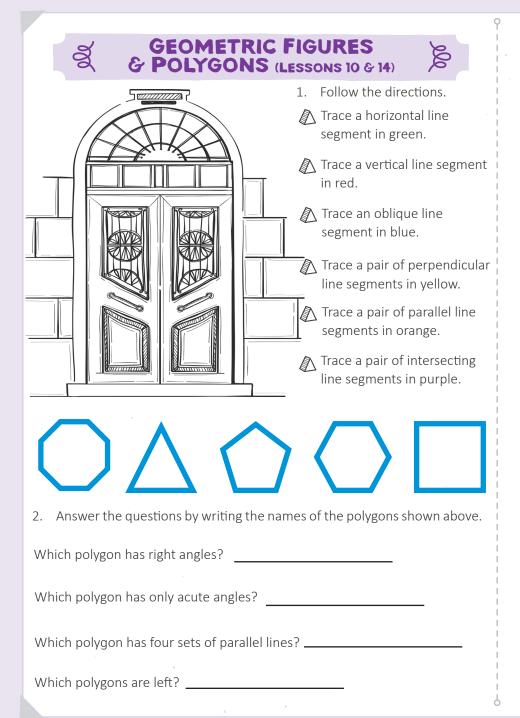
3. Mary and her family are driving from Kansas to Colorado. They leave at 7:35 AM and arrive at 11:23 AM. How long did the drive take?

4. Takeshi ran in a race for a local charity. It took him 2 hours and 27 minutes to complete the race, and he finished at 4:38 PM. What time did the race start?

Additional Practice
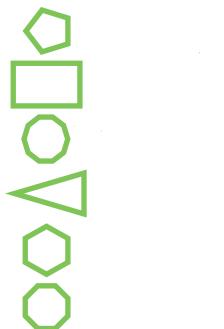
Fill in the missing start and end times for each flight. Show your work on a separate piece of paper.

Destination	Start Time	Flight Duration	End Time
Hamburg, Germany	8:31 AM	3 hours 13 minutes	
Vancouver, Canada		7 hours 39 minutes	10:15 PM
Nairobi, Kenya		2 hours 52 minutes	4:42 PM
Nong Kai, Thailand	1:47 AM	8 hours 24 minutes	
Buenos Aires, Argentina		2 hours 42 minutes	8:39 PM

GEOMETRIC FIGURES & POLYGONS (LESSONS 10 & 14)

1. Follow the directions.

△ Trace a horizontal line segment in green.

△ Trace a vertical line segment in red.

△ Trace an oblique line segment in blue.

△ Trace a pair of perpendicular line segments in yellow.

△ Trace a pair of parallel line segments in orange.

△ Trace a pair of intersecting line segments in purple.

2. Answer the questions by writing the names of the polygons shown above.

Which polygon has right angles? _____

Which polygon has only acute angles? _____

Which polygon has four sets of parallel lines? _____

Which polygons are left? _____

Additional Practice

1. Draw a line from each polygon to its name.

Triangle

Octagon

Pentagon

Hexagon

Quadrilateral

Decagon

2. Use the clues to identify the mystery letter.

A M F L G X Z O H J T

I have no oblique line segments.

I have only straight line segments.

I have a set of parallel line segments.

I have a set of perpendicular line segments.

I have two horizontal line segments and one vertical line segment.

Which letter am I?

UNIT 2 OVERVIEW

LESSONS 31-60

Extra Supplies Needed

- ruler
- measuring cups and large bowl
- colored pencils or crayons

New Concepts Taught

- add/subtract fractions (uncommon denominators)
- associative property of addition
- associative property of multiplication
- convert improper fractions to mixed numbers
- divisibility rules for 2, 5, and 10
- exponents
- long division (one-digit divisors)
- order of operations
- perfect squares to 144
- prime and composite numbers
- triangle classification by angles

Concepts Reviewed and Expanded Upon

- compare fractions
- conversion (units of volume)
- equivalent fractions
- fractions of a set
- graphs (pictographs, bar graphs, and line graphs)
- lines of symmetry
- missing factors
- multiples and factors
- multiplication by 100, 1,000, and 10,000
- perimeter and area (rectangles, squares, and triangles)
- problem solving with multiple steps
- reflectional symmetry
- rotational symmetry
- similar and congruent shapes
- temperature
- triangle classifications by sides

Parent/Teacher Tips

As students learn more advanced concepts, they may want to refer to the Reference Guide on page 394, especially when completing the Review sections. The Reference Guide has visuals and guides to help students practice and memorize certain concepts.

Lesson 40
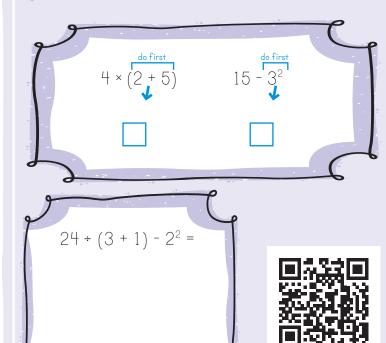
ORDER OF OPERATIONS

✏️ Complete today's *Math 4 Mental Math Map Mysteries* activity.
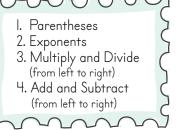
📖 Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4.

do first
$$4 \times (2 + 5)$$
☐

do first
$$15 - 3^2$$
☐

$$24 \div (3 + 1) - 2^2 =$$

Mini Lesson

The **order of operations** is a set of rules that states the order in which to perform mathematical operations. The correct order is shown here. To help remember the correct order, we can use this phrase below:

1. Parentheses
2. Exponents
3. Multiply and Divide (from left to right)
4. Add and Subtract (from left to right)

(Please) Excuse^2 My × Dear ÷ Aunt + Sally -
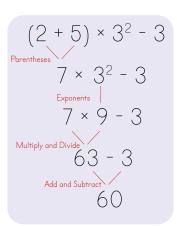
The first letter of each word represents a step in the order of operations. The letter "P" is for parentheses, and "E" stands for exponents. "M" and "D" are for multiplication and division, and "A" and "S" mean addition and subtraction.

When simplifying a problem, we start with operations inside parentheses. In the purple box, 2 + 5 is inside the parentheses and is done first. The sum is 7.

Next, we look for any exponents. Exponents tell us how many times a number is multiplied by itself. The number 3^2 is 3 × 3, which is 9.
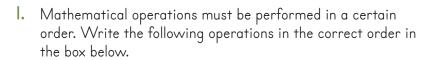
Then we look for multiplication and division. We multiply and divide from left to right. Whichever operation appears first in the problem is done first. The multiplication fact 7 × 9 is 63.

Finally, we add and subtract, again moving from left to right. The subtraction problem 63 − 3 is 60. After following the order of operations, we find the problem (2 + 5) × 3^2 − 3 simplifies to 60.

If we are simplifying a problem that does not have parentheses, we move to the next step. Think of it as a checklist. If a step is not found in the problem, cross it off and move to the next step.

$$(2 + 5) \times 3^2 - 3$$
Parentheses
$$7 \times 3^2 - 3$$
Exponents
$$7 \times 9 - 3$$
Multiply and Divide
$$63 - 3$$
Add and Subtract
$$60$$

Snowing SOLUTIONS

1. Mathematical operations must be performed in a certain order. Write the following operations in the correct order in the box below.

ADD & SUBTRACT   PARENTHESES   MULTIPLY & DIVIDE   EXPONENTS

1.

2.

3.

4.

2. If one operation is not present in a problem, skip it and go to the next operation. In the problem $3 + 4 \times 7$, there are no parentheses or exponents, so you would skip those steps and go to the next. Multiplication is the first step in this example. For each problem below, write which step you would complete first using the order of operations.

$(4 + 2) \times 4^2 - 1 =$

$4 - 2 + 1 =$

$4 + 2 \times 4^2 - 1 =$

$4 + 2 \times 3 - 1 =$

3. Write the phrase that can help you remember the order of operations.

P _ _ _ _ _ _ _   E _ _ _ _ _ _ _   M _ _

D _ _ _ _   A _ _ _ _   S _ _ _ _ _

4. Complete each problem using the order of operations. Use scratch paper if you need more room. Remember, if you have both multiplication and division or addition and subtraction in the same problem, you work from left to right.

$10 - 4 + (5 \times 5) =$ $20 - (8 \times 2) =$

$(3 + 5) \div 2 =$ $5 \times (6 - 3) + 7 =$

$4^2 + (15 \div 3) =$ $6 \times 4 + 5 - 10 =$

$12 - (3 \times 2) + 2^2 =$ $2^2 \div 2 + (4 \times 1) =$
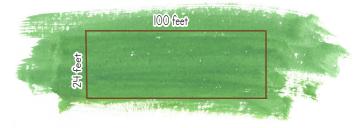
Review
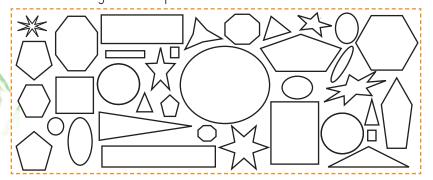
1. Luis' family has a llama farm in the mountains of Peru. They bought five new llamas and are building a corral for them. Using the diagram, find how many feet of fencing they will need to build the new corral.

2. Luis knows that they need at least 2,000 sq ft of grass for the five new llamas. Is the new corral big enough? What is the area of the new corral?

100 feet

24 feet

3. Find the congruent shapes and color each set the same color.
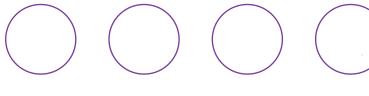
4. Which fraction is the greatest? Divide and shade the shapes to find out. Circle the greatest fraction.

$\dfrac{3}{4}$ $\dfrac{2}{3}$ $\dfrac{5}{6}$ $\dfrac{1}{2}$

★ Read with your parent or teacher ★

It's time to take your next Multiplication Mastery Assessment. Have your parent or teacher quiz you on Multiplication Set C, using the Multiplication Mastery Chart on page 395.

Parent/Teacher: Indicate which facts from Set C the student has mastered in the "Mastered" column on page 395. Your student will continue to review and practice these facts throughout the course.

Lesson 57

TWO-STEP STORY PROBLEMS

📖 Complete today's *Math 4 Mental Math Map Mysteries* activity.

📖 Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4.

Logan was 7 years old yesterday. If today is his birthday, how old is he now?

Sam is 6 years younger than Logan. Eli is twice Sam's age. If Logan is 8 years old, how old is Eli?

Logan's age:

Sam's age:

Eli's age:

Mini Lesson

A story problem uses a story to ask a question that you can complete using mathematical operations, such as addition, subtraction, multiplication, and division.

Story Problem	Math
Max is 13 years old. His sister, Maggie, is 5 years younger. How old is Maggie?	$13 - 5 = 8$ Maggie is 8 years old.

Not all story problems have only one step. Some problems require two steps or more to find the answer. The following example has two parts, and both must be done to get the final answer.

Story Problem	Procedure
Max is 13 years old. His sister, Maggie, is 5 years younger. Their older brother, Jack, is 2 times Maggie's age. How old is Jack?	First, underline the question. Next, circle important information in the story problem.

In this problem we know the age of one child and must use two operations to find the ages of the other children.

First, we know Max is 13. Maggie is 5 years younger than Max, so we subtract 5 from 13 to find Maggie's age.

$$13 - 5 = 8$$

Maggie is 8 years old.

Now that we know how old Maggie is, we can find how old Jack is. Jack is 2 times Maggie's age, so we multiply 8 by 2.

$$8 \times 2 = 16$$

Jack is 16 years old.

The question in this two-step story problem is "How old is Jack?" We now know Jack is 16 years old.

STEP RIGHT UP · Guess My Name · STEP RIGHT UP

Welcome to the carnival! You are the guesser for a game called "Guess My Name." You already know the ages of all the children shown above, and you have to guess each child's name. Solve the story problems presented by each mystery child below. When you find how old a child is, write the name above the correct child.
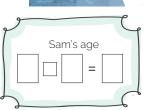
Sam turned 8 years old 2 years ago. If his birthday was yesterday, how old is Sam today?

Sam's age
☐ ☐ ☐ = ☐
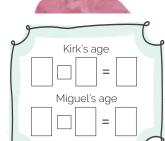
Kirk is 5 years younger than Sam. Miguel is 2 years older than Kirk. How old are Miguel and Kirk?

Kirk's age
☐ ☐ ☐ = ☐

Miguel's age
☐ ☐ ☐ = ☐

Scott is 1 year older than Miguel. Lena is half the age of Scott. How old are Scott and Lena?

Scott's age
☐ ☐ ☐ = ☐

Lena's age
☐ ☐ ☐ = ☐
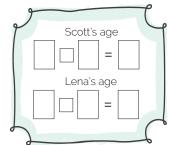
Sarah is 1 year younger than Lena. Rosie is 3 times as old as Sarah. How old are Sarah and Rosie?

Sarah's age
☐ ☐ ☐ = ☐

Rosie's age
☐ ☐ ☐ = ☐
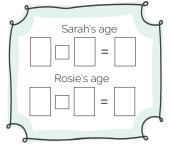
Challenge Problem

Nathan's little sister, Denise, is 3 years younger than he is. His brother, Robert, is 3 times as old as Denise.

If Robert is 12 years old, is Nathan 6, 7, or 8 years old?

How old is Denise?

Review

1. Find the perfect squares.

$4^2 =$ $3^2 =$ $6^2 =$

2. Convert each problem from factored form to exponent form.

$4 \times 4 =$ ⬜

$3 \times 3 \times 3 \times 3 =$ ⬜

$7 \times 7 \times 7 \times 7 \times 7 =$ ⬜
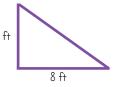
$6 \times 6 \times 6 \times 6 \times 6 \times 6 \times 6 =$ ⬜

3. Complete each problem.

$3\overline{)423}$ $6\overline{)966}$ $8\overline{)328}$

$5\overline{)215}$ $7\overline{)266}$ $4\overline{)252}$

4. Find the area of each shape. Hint: Find the area of a triangle by multiplying the base by the height and dividing by 2.

4 cm · 12 cm (rectangle)

6 ft · 8 ft (triangle)

9 m · 24 m (triangle)

7 in · 7 in (square)

5. Add or subtract the fractions below.

$$\frac{8}{12} + \frac{3}{12} = \underline{\quad}$$

$$\frac{7}{8} - \frac{3}{8} = \underline{\quad}$$

$$\frac{5}{6} + \frac{1}{6} = \underline{\quad}$$

See the Reference Guide on page 394.

Read with your parent or teacher

It's time to take your next Multiplication Mastery Assessment. Have your parent or teacher quiz you on Multiplication Set D using the Multiplication Mastery Chart on page 395.

Parent/Teacher: Indicate which facts from Set D your student has mastered in the "Mastered" column on page 395.

Students will continue to practice all of their multiplication facts throughout Unit 3, but will not be prompted to practice the sets daily. If your student has not passed off all the facts, continue to work with him or her to pass them off. In Unit 4 you will be prompted to review the sets using the Multiplication Mastery Chart.

UNIT 3 OVERVIEW

LESSONS 61–90

New Concepts Taught

- add/subtract decimals to the thousandths place
- change mixed numbers to improper fractions
- circles (center, radius, and diameter)
- distributive property
- find mixed numbers using long division
- geometric transformations
- long division (with remainders)
- long division (zero in the quotient)
- measuring turns
- multiplication (two-digit by two-digit)
- perimeter and area (irregular shapes)
- reducing fractions to simplest form
- tessellations (regular and semi-regular)
- volume of cubes
- volume of rectangular prisms

Concepts Reviewed and Expanded Upon

- conversion (units of length)
- geometric solids
- multiplication (multiples of 100, 1,000, and 10,000)
- naming geometric figures
- patterns
- quadrilateral classification
- Roman numerals

Parent/Teacher Tips

Students will complete multiplication facts in every lesson in Unit 3; however, they will not be prompted to practice the multiplication Sets A–D anymore. Memorizing these facts is vital. If the child is still struggling, consider continuing daily practice using *Musical Multiplication* or another method.

Lesson 67
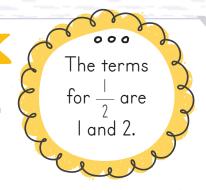
REDUCING FRACTIONS

⚠ Complete today's *Math 4 Mental Math Map Mysteries* activity.

📖 Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful .com/Math4.

Recipe
GLOOP
$\frac{6}{12}$ c cornstarch
$\frac{4}{16}$ c water

$\frac{6}{12}$ $\frac{4}{16}$
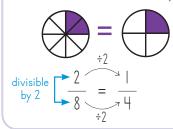
Mini Lesson

When working with fractions, it is best practice to reduce a fraction to lowest terms, also known as simplest form. The terms of a fraction are its numerator and denominator.

The terms for $\frac{1}{2}$ are 1 and 2.

Both the numerator and denominator are even and are therefore divisible by 2. Two is a common factor of 2 and 8, so divide both the numerator and denominator by 2.

$$\div 2$$
divisible by 2 $\begin{array}{c} 2 \\ \underline{} = \dfrac{1}{4} \\ 8 \end{array}$
$$\div 2$$
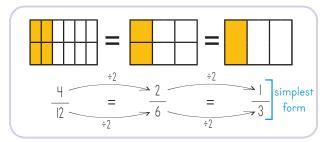
When reducing a fraction, change it to an equivalent fraction with smaller terms. A fraction can be reduced only if the numerator and denominator can be divided by a common factor other than 1.

When both the numerator and the denominator are divided by the same number, the terms of the fraction decrease, but the value stays the same. The fractions $\frac{2}{8}$ and $\frac{1}{4}$ are equivalent fractions.

Sometimes after reducing a fraction, the fraction is still not in simplest form.

To reduce a fraction to simplest form, continue dividing the numerator and denominator by common factors until they can only be divided by 1.

A fraction is reduced to its lowest terms when the numerator and denominator can only be divided by the common factor of 1.

$$\frac{4}{12} \xrightarrow{\div 2} \frac{2}{6} \xrightarrow{\div 2} \frac{1}{3} \Big] \text{simplest form}$$
$$\div 2 \qquad \div 2$$

Not all fractions can be reduced. The fractions below cannot be reduced because the only number that divides evenly into both the numerator and denominator is 1. They are already written in lowest terms.

$$\frac{4}{5} \qquad \frac{2}{7} \qquad \frac{8}{11} \qquad \frac{5}{9}$$

Lesson Practice

1. Circle the fractions in the balloons below that are already in simplest form and cannot be reduced.

$\frac{2}{4}$

$\frac{6}{8}$

$\frac{3}{7}$

$\frac{9}{12}$

$\frac{1}{5}$

$\frac{5}{6}$

$\frac{4}{8}$

$\frac{1}{3}$

$\frac{13}{15}$

$\frac{6}{12}$

$\frac{7}{21}$

$\frac{1}{10}$

$\frac{4}{12}$

$\frac{2}{7}$

$\frac{3}{4}$

$\frac{10}{20}$

$\frac{7}{14}$

$\frac{3}{11}$

$\frac{1}{7}$

$\frac{4}{5}$

2. Draw a line from the fraction on the top row to its simplest form on the bottom row.

$\frac{2}{4}$ $\frac{5}{15}$ $\frac{6}{9}$ $\frac{4}{16}$ $\frac{6}{8}$ $\frac{5}{25}$

$\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{4}$

3. Write each fraction in simplest form. Remember, you may need to divide the fraction more than once to reduce it to simplest form.

$\frac{4}{6}$ ⬚ $\frac{3}{9}$ ⬚ $\frac{8}{16}$ ⬚

$\frac{6}{10}$ ⬚ $\frac{5}{20}$ ⬚ $\frac{8}{24}$ ⬚

$\frac{7}{21}$ ⬚ $\frac{8}{12}$ ⬚ $\frac{12}{30}$ ⬚

1. Eli is ice-skating. He skates south for a while and then turns 90 degrees in a clockwise direction and continues skating. Which direction is he going now?

2. Which geometric transformation (translation, rotation, or reflection) needs to happen to move the blue triangle directly on top of the green triangle?

3. Draw a geometric transformation of this shape by reflecting it across the red line.

4. What is the most specific name of a quadrilateral that is both a rhombus (has 4 equal sides) and a rectangle (has 4 right angles)?

Review

5. Complete each problem. Use scratch paper if necessary.

$$6\overline{)354} \quad 3\overline{)258} \quad 9\overline{)315} \quad 4\overline{)248}$$

$$7 \times 40{,}000 =$$
$$5 \times 5{,}000 =$$
$$8 \times 400 =$$

$$12 \times 60 =$$
$$12 \times 70 =$$
$$12 \times 30 =$$

$$\frac{7}{12} + \frac{1}{4} = \underline{\quad}$$

$$\frac{11}{18} - \frac{2}{6} = \underline{\quad}$$

6. Circle each type of quadrilateral that applies.

Parallelogram	Parallelogram	Parallelogram
Trapezoid	Trapezoid	Trapezoid
Rectangle	Rectangle	Rectangle
Rhombus	Rhombus	Rhombus
Square	Square	Square

7. Label each triangle below as right, acute, or obtuse. Remember, a right triangle has a right angle, an obtuse triangle has an obtuse angle, and an acute triangle has three acute angles.

_____ _____ _____

8. Estimate the answer by rounding to the nearest ten thousand. Then complete the problem to see how close your estimate is.

$$\begin{array}{r} 158{,}354 \\ + \quad 22{,}351 \\ \hline \end{array}$$

9. Pablo is 14 years old. His brother Luca is half of Pablo's age. His sister Ella is three times Luca's age. How old are Ella and Luca?

| 3 | 7 | 11 | 4 | 7 | 9 | 11 | 6 | 8 | 5 | 6 | 3 | 6 | 9 | 8 |
| $\times 9$ | $\times 8$ | $\times 4$ | $\times 9$ | $\times 12$ | $\times 7$ | $\times 12$ | $\times 7$ | $\times 12$ | $\times 9$ | $\times 12$ | $\times 8$ | $\times 9$ | $\times 12$ | $\times 9$ |

Lesson 76
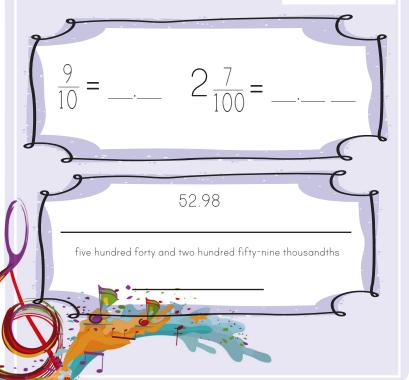
DECIMALS AND FRACTIONS

📐 Complete today's *Math 4 Mental Math Map Mysteries* activity.

📖 Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4.

$$\frac{9}{10} = \underline{}.\underline{} \qquad 2\frac{7}{100} = \underline{}.\underline{}\underline{}$$

52.98

_____

five hundred forty and two hundred fifty-nine thousandths

_____

Mini Lesson

Both fractions and decimal numbers are used to show fractional parts of a whole. Consider the number three-tenths. As a fraction this number is written with a numerator and denominator. When writing three-tenths as a decimal number, we write only the numerator. The denominator of the fraction is shown by the place value of the last digit after the decimal point.

$$\frac{3}{10} = 0.3 \qquad \frac{45}{100} = 0.45 \qquad \frac{751}{1,000} = 0.751$$

tenths → tenths place   hundredths → hundredths place   thousandths → thousandths place

To read a decimal number in word form, first say the whole number. Next, say "AND" for the decimal point. Finally, say the digits to the right of the decimal point as a whole number and the place value of the last digit.

5.2	43.21	12.354
five and two tenths	forty-three and twenty-one hundredths	twelve and three hundred fifty-four thousandths

Sometimes a zero is needed as a placeholder. For example, consider the fraction below.

$$\frac{9}{100} = 0.09$$

hundredths → hundredths place

The denominator of 100 means that the 9 in the numerator must be written in the hundredths place. However, the tenths place cannot be empty. A zero is written in the tenths place so the 9 is in the hundredths place.

Zero is also used as a placeholder when there is no whole number with the fractional part of a decimal number. The number five-tenths is written with a zero before the decimal point because there is no whole number in this decimal number. Always write a zero before the decimal point if there is no whole number.

$$\frac{5}{10} = 0.5$$

Lesson Practice

1. Read each decimal number aloud to your parent or teacher.

32.5   7.86   14.247   0.2   123.14   0.54   4.7   0.674

2. Circle the correct word form for each decimal number.

4.05

a) four and five tenths
b) four and five hundredths
c) four and five thousandths

72.9

a) seventy-two and nine hundredths
b) seventy-two and nine tenths
c) seventy-two and nine thousandths

13.169

a) thirteen and one six nine thousandths
b) thirteen and one hundred sixty-nine thousandths
c) one three and one hundred sixty-nine thousandths

3. Complete the chart.

	$7\frac{9}{10}$	7.9
fifty-seven and three hundredths		57.03
three hundred seven and eleven thousandths	$307\frac{11}{1,000}$	

4. Write each fraction as a decimal number.

$\frac{6}{10}$ [ ] $\frac{4}{100}$ [ ] $\frac{22}{100}$ [ ]

$\frac{3}{1,000}$ [ ] $\frac{9}{10}$ [ ] $\frac{4}{10}$ [ ]

$\frac{43}{100}$ [ ] $\frac{364}{1,000}$ [ ] $\frac{587}{1,000}$ [ ]
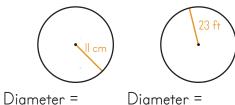
5. Write each decimal number using digits.

a) four and three tenths [ ]

b) twenty-two and thirty-seven hundredths [ ]

c) six and one hundred eighteen thousandths [ ]

d) eighty-three hundredths [ ]

Review

1. Match the Roman numerals to the numbers.

XIV   20
LI   17
XX   51
C   14
XVII   100

2. Write the measurement of each diameter.

11 cm

23 ft

Diameter =   Diameter =

3. Follow the instructions to write the number.

a) Write a 6 in the hundredths place.
b) Write a 1 in the ones place.
c) Write an 8 in the thousandths place.
d) Write a 3 in the tenths place.
e) Write a 4 in the tens place.
f) Write a 9 in the hundreds place.

___ ___ ___ . ___ ___ ___

4. Shade the shapes to represent each mixed number. Then use the shaded shapes to write the improper fraction.

$2\frac{3}{4}$

$3\frac{1}{3}$

5. Add the fractions by creating fractions with common denominators.

$$\frac{2}{4} + \frac{4}{8} = \underline{} \qquad \frac{4}{12} + \frac{1}{3} = \underline{} \qquad \frac{4}{10} + \frac{1}{5} = \underline{}$$

6. Reduce all three answers in Problem 5 above to their simplest forms.

7. Complete the problem using the order of operations.
Hint: Please Excuse My Dear Aunt Sally.

$$27 - 3 \times 2^2 + (15 - 5) =$$

8. Complete each problem. Use scratch paper if necessary.

$$3\overline{)1,872} \qquad 6\overline{)486} \qquad 7\overline{)406}$$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ \times 9 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 12 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$$

Lesson 78

DISTRIBUTIVE PROPERTY

📖 Complete today's *Math 4 Mental Math Map Mysteries* activity.

📘 Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4.

26 yards

12 yards

12 yards

26 yards

$$2 \times (\underline{} + \underline{}) =$$
length width

$$(2 \times \underline{}) + (2 \times \underline{}) =$$
length width

$$4 \times (12 + 8) =$$

$$(\underline{} \times \underline{}) + (\underline{} \times \underline{}) =$$

$$\underline{} + \underline{} =$$
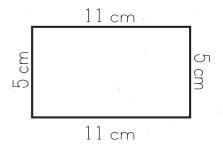
Mini Lesson

The perimeter of a rectangle can be found by adding the lengths of all the sides. To find the perimeter of this rectangle, add 5 cm + 5 cm + 11 cm + 11 cm, which is 32 cm.

11 cm

5 cm

5 cm

11 cm

We can also find the perimeter by using both multiplication and addition.

One way is to add the length (L) and the width (W) together and then double that amount.

Perimeter = 2 × (L + W)
2 × (11 cm + 5 cm)
2 × (16 cm)
32 cm

Another way is to double the length (L) and double the width (W), and then add the products.

Perimeter = 2L + 2W
(2 × 11 cm) + (2 × 5 cm)
22 cm + 10 cm
32 cm
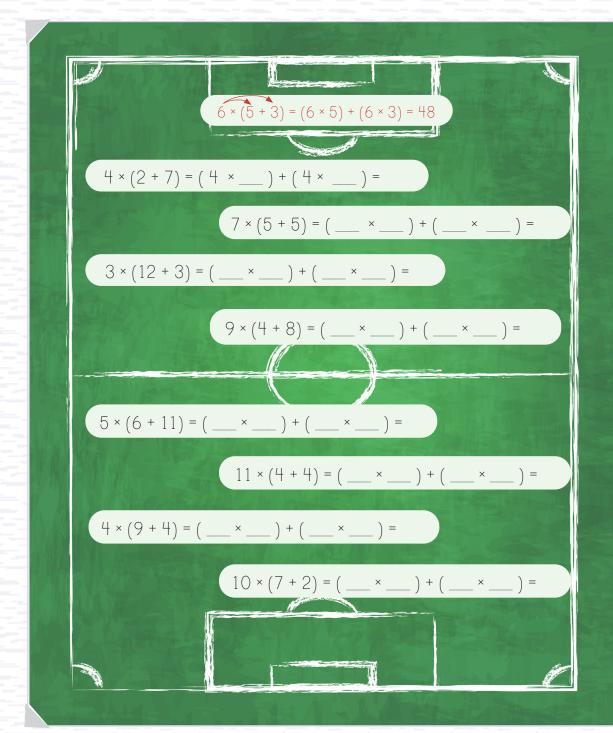
Either way the answer is still 32.

$$2 \times (11 + 5) = (2 \times 11) + (2 \times 5)$$

⬇ ⬇
32 32

This illustrates an important property in mathematics called the distributive property. The ***distributive property*** states that multiplying by a sum is the same as multiplying by each value in the sum and combining the products.

In 2 × (L + W), the 2 is distributed to both the length and width using multiplication. First, 2 is multiplied by L. Then 2 is multiplied by W. Finally, the products are added because there is an addition sign in the parentheses.

$$2 \times (L + W) = (2 \times L) + (2 \times W)$$

$6 \times (5 + 3) = (6 \times 5) + (6 \times 3) = 48$

$4 \times (2 + 7) = (\, 4 \times \underline{\quad} \,) + (\, 4 \times \underline{\quad} \,) =$

$7 \times (5 + 5) = (\, \underline{\quad} \times \underline{\quad} \,) + (\, \underline{\quad} \times \underline{\quad} \,) =$

$3 \times (12 + 3) = (\, \underline{\quad} \times \underline{\quad} \,) + (\, \underline{\quad} \times \underline{\quad} \,) =$

$9 \times (4 + 8) = (\, \underline{\quad} \times \underline{\quad} \,) + (\, \underline{\quad} \times \underline{\quad} \,) =$

$5 \times (6 + 11) = (\, \underline{\quad} \times \underline{\quad} \,) + (\, \underline{\quad} \times \underline{\quad} \,) =$

$11 \times (4 + 4) = (\, \underline{\quad} \times \underline{\quad} \,) + (\, \underline{\quad} \times \underline{\quad} \,) =$

$4 \times (9 + 4) = (\, \underline{\quad} \times \underline{\quad} \,) + (\, \underline{\quad} \times \underline{\quad} \,) =$

$10 \times (7 + 2) = (\, \underline{\quad} \times \underline{\quad} \,) + (\, \underline{\quad} \times \underline{\quad} \,) =$

Lesson Practice

1. Use the distributive property to complete each problem on the soccer field. Use scratch paper if you need more room.

2. Find the perimeter of each playing field below by using the formula **P = 2 × (L + W).**

A) Ping Pong Table
   Length: 9 ft
   Width: 5 ft

B) Olympic Swimming Pool
   Length: 50 m
   Width: 25 m

C) Volleyball Court
   Length: 59 ft
   Width: 30 ft

D) Bowling Lane
   Length: 60 ft
   Width: 4 ft

E) Horseshoe Pit
   Length: 43 in
   Width: 31 in

F) Curling Court
   Length: 146 ft
   Width: 14 ft

Review

Left sidebar multiplication problems:

7 × 7	4 × 6
4 × 12	7 × 9
6 × 8	3 × 5
6 × 9	4 × 8
11 × 12	5 × 4
5 × 9	9 × 12
8 × 9	6 × 5
3 × 12	10 × 4

1. Write each fraction as a decimal number.

$\frac{1}{10}$ ☐ $\frac{24}{100}$ ☐

$\frac{674}{1,000}$ ☐ $\frac{7}{10}$ ☐

$\frac{6}{100}$ ☐ $\frac{44}{1,000}$ ☐

2. Each shape below has been rotated. Label each rotation with the direction and degree of the turn.

_____   _____
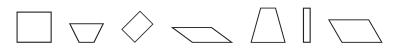
3. Find the missing factors. Then circle all the factors that are prime numbers.

96   78   75

4 × ____   3 × ____   5 × ____

8 × ____   2 × ____   3 × ____

4. Write the number for each Roman numeral.

LXII –   XL –
XXIX –   IV –

5. Write the place value of the underlined digit in each number using the word bank below.

287.6<u>9</u>4   2<u>3</u>.758   0.01<u>7</u>

_____   _____   _____

4.<u>3</u>71   <u>9</u>34.862   8.34<u>7</u>

_____   _____   _____

hundreds, ones, tenths, hundredths, thousandths

6. Circle every shape that can be classified as a parallelogram (a quadrilateral with two pairs of parallel sides).

7. Reduce each fraction to its simplest form.

$\frac{8}{24}$ ☐ $\frac{9}{81}$ ☐ $\frac{15}{18}$ ☐ $\frac{18}{30}$ ☐

8. Write the multiples of 4 from 20 to 48.

20, ____, ____, ____, ____, ____, ____, 48

Lesson 87

ADDING AND SUBTRACTING DECIMALS
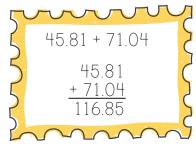
✎ Complete today's *Math 4 Mental Math Map Mysteries* activity.

📖 Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4.

Mini Lesson

When adding and subtracting decimal numbers, write the numbers vertically, making sure to line up the numbers according to the decimal points and place values.

$$45.81 + 71.04$$

$$\begin{array}{r} 45.81 \\ + \ 71.04 \\ \hline 116.85 \end{array}$$

When adding decimal numbers, add each place value and regroup as needed. Write the sum below the line. Write the decimal point directly below the decimal points in the problem.

When subtracting decimal numbers, subtract each place value and borrow as needed. Write the difference below the line. Write the decimal point directly below the decimal points in the problem.

$$75.24 - 42.11$$

$$\begin{array}{r} 75.24 \\ - \ 42.11 \\ \hline 33.13 \end{array}$$

If the decimal numbers being added or subtracted have a different number of digits, line up the numbers vertically according to the decimal points. Write zeros as placeholders in any empty places.

$$23.89 + 3.5$$

$$\begin{array}{r} \overset{1}{2}3.89 \\ + \ \ 3.50 \\ \hline 27.39 \end{array}$$

$$35.947 - 12.05$$

$$\begin{array}{r} 35.\overset{8}{\cancel{9}}47 \\ - \ 12.050 \\ \hline 23.897 \end{array}$$

Lesson Practice

1. Complete each problem.

$$\begin{array}{r} 49.39 \\ +\ 7.88 \\ \hline \end{array}$$

$$\begin{array}{r} 223.07 \\ +\ 53.20 \\ \hline \end{array}$$
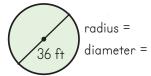
2. Rewrite each problem vertically and complete it.

133.04 + 87.369

9.12 + 164.027

$$\begin{array}{r} 428.17 \\ -\ 37.99 \\ \hline \end{array}$$

$$\begin{array}{r} 73.497 \\ -12.510 \\ \hline \end{array}$$

95.04 - 0.327

458.993 - 64.2
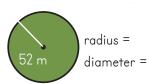
3. Meri has $37.95 to spend at the farmers market. She buys a bag of peaches for $11.52 and a loaf of fresh bread for $7.96. How much money does she have left?

4. José is selling homemade candles at the farmers market. In the morning he made $88.20, and in the afternoon he made $38.64. How much more money does he need to make to have $150?

5. Jocelyn is in charge of weighing fruit at her family's stand. The first batch of tomatoes weighed 25.034 lb, the second batch weighed 8.39 lb, and the third batch weighed 18.7 lb. How much did the tomatoes weigh in total?

Review

1. Write the measurements of the radius and diameter of each circle.

36 ft
radius = _____
diameter = _____

11 mm
radius = _____
diameter = _____

52 m
radius = _____
diameter = _____

2. Write each decimal number using digits.

a) thirty-two and one hundred twenty-five thousandths

b) eighty-seven hundredths

a) three hundred nine and four tenths

3. Convert each improper fraction to a mixed number.

$\frac{17}{6}$ ☐ $\frac{31}{3}$ ☐ $\frac{11}{4}$ ☐ $\frac{9}{2}$ ☐

See the Reference Guide on page 394.
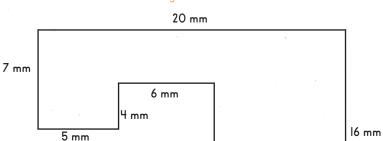
4. Write the rule for each pattern, and then continue the pattern.

84, 73, 62, 51, ____, ____, ____   Rule: _____

52, 55, 58, 61, ____, ____, ____   Rule: _____

5. Complete each problem. Use scratch paper if needed.

$4\overline{)5,725}$ $7\overline{)158}$

27
× 23
_____

31
× 61
_____

32
× 25
_____
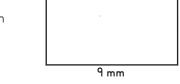
6. Find the perimeter and area. Hint: Divide this shape into three smaller rectangles.

20 mm

7 mm

6 mm

4 mm

5 mm

13 mm

16 mm

9 mm

Perimeter = _____ mm

Area = _____ sq mm

7. How many inches are in a foot?

8. How many feet are in a yard?

9. How many inches are in a yard?

10. How many feet are in a mile?

11. How many millimeters are in a centimeter?

12. How many centimeters are in a meter?

13. How many millimeters are in a meter?

14. How many meters are in a kilometer?

Multiplication *MASTERY*

OPTIONAL: Time yourself to see how long this page takes you. Try to beat your previous time from Lesson 80.

TIME:

5	8	9	12	3	12	6	4	7	12	4	6	9	5
× 3	× 4	× 9	× 6	× 4	× 7	× 4	× 5	× 4	× 8	× 3	× 5	× 7	× 12

5	9	7	12	6	12	9	3	8	5	3	9	3	7
× 8	× 5	× 3	× 5	× 7	× 11	× 3	× 6	× 8	× 7	× 12	× 6	× 5	× 9

3	4	6	4	3	6	4	8	10	5	3	6	2	3
× 3	× 6	× 6	× 12	× 7	× 9	× 7	× 6	× 7	× 9	× 0	× 11	× 12	× 9

7	9	8	6	12	12	4	5	7	4	8	9	12	4
× 7	× 12	× 5	× 3	× 3	× 12	× 9	× 5	× 6	× 8	× 12	× 8	× 2	× 4

11	5	6	12	7	9	6	3	7	12	8	5	7	11
× 12	× 4	× 8	× 4	× 8	× 4	× 12	× 8	× 5	× 9	× 9	× 6	× 12	× 4

Lesson 88

NAMING GEOMETRIC FIGURES

△ Complete today's *Math 4 Mental Math Map Mysteries* activity.

⚠ Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4.

A •   B •   E •

D •   C •   F •

_____   _____

_____

#1 _____

#2 _____

#3 _____
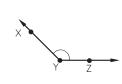
Mini Lesson

Points, line segments, rays, lines, angles, and polygons are examples of **geometric figures**. Geometric figures often have capital letters listed by each vertex or point. These letters are used when naming geometric figures.

Points are named using one letter.	Point A A•
Line segments are named using the letters at the two endpoints. The order of the endpoints does not matter. The name of a line segment can be abbreviated by drawing a line segment above the two endpoint letters.	F ——————— G $\overline{FG}$ $\overline{GF}$
Rays are named using the endpoint and any other point on the ray. When naming a ray, the order matters. List the endpoint first and then another point on the ray. The name of a ray can be abbreviated by drawing a ray above the letters that points to the right.	A E → D B ← $\overrightarrow{AE}$ $\overrightarrow{BD}$
Lines are named using any two points found on the line. The order of the letters does not matter. The name of a line can be abbreviated by drawing a line above the letters.	W X Y $\overleftrightarrow{WY}$ $\overleftrightarrow{WX}$ $\overleftrightarrow{XY}$ $\overleftrightarrow{XW}$ $\overleftrightarrow{YX}$ $\overleftrightarrow{YW}$
Angles are named using the letter at the vertex or the letter at the vertex and one letter from each ray. Order does not matter if you use three letters; however, the vertex should always be listed as the middle letter. The abbreviation for an angle uses an angle symbol before the letter or letters.	A B C F D E $\angle B \angle ABC \angle CBA$ $\angle E \angle DEF \angle FED$
Polygons are named using the letters found at each vertex. Start at any vertex, and then list the letters in order around the polygon until you list all the vertices. When reading the name, say the name of the polygon, and then say the vertices in order.	L N M triangle LMN triangle LNM triangle MNL triangle NML triangle NLM triangle MLN

Lesson Practice

1. For each geometric figure below, circle ALL correct names.

∠Y
∠YXZ
∠ZYX

square GIHJ
square IHGJ
square GHIJ

$\overline{ST}$
$\overleftrightarrow{ST}$
$\overrightarrow{TS}$
$\overrightarrow{ST}$

$\overrightarrow{AE}$
$\overrightarrow{EA}$
$\overline{AE}$
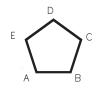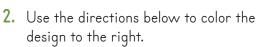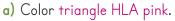
∠STR
∠SRT
∠S

hexagon ABCDE
octagon BCDEA
pentagon AEDCB
pentagon DEABC

2. Use the directions below to color the design to the right.
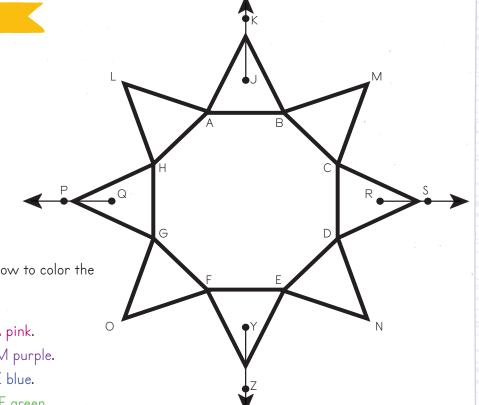
a) Color triangle HLA pink.
b) Color triangle BCM purple.
c) Color triangle DNE blue.
d) Color triangle OGF green.
e) Trace $\overrightarrow{JK}$ and $\overrightarrow{YZ}$ in yellow.
f) Trace $\overrightarrow{QP}$ and $\overrightarrow{RS}$ in red.
g) Color octagon ABCDEFGH orange.
h) Color the rest of the shapes in the design any color you want.
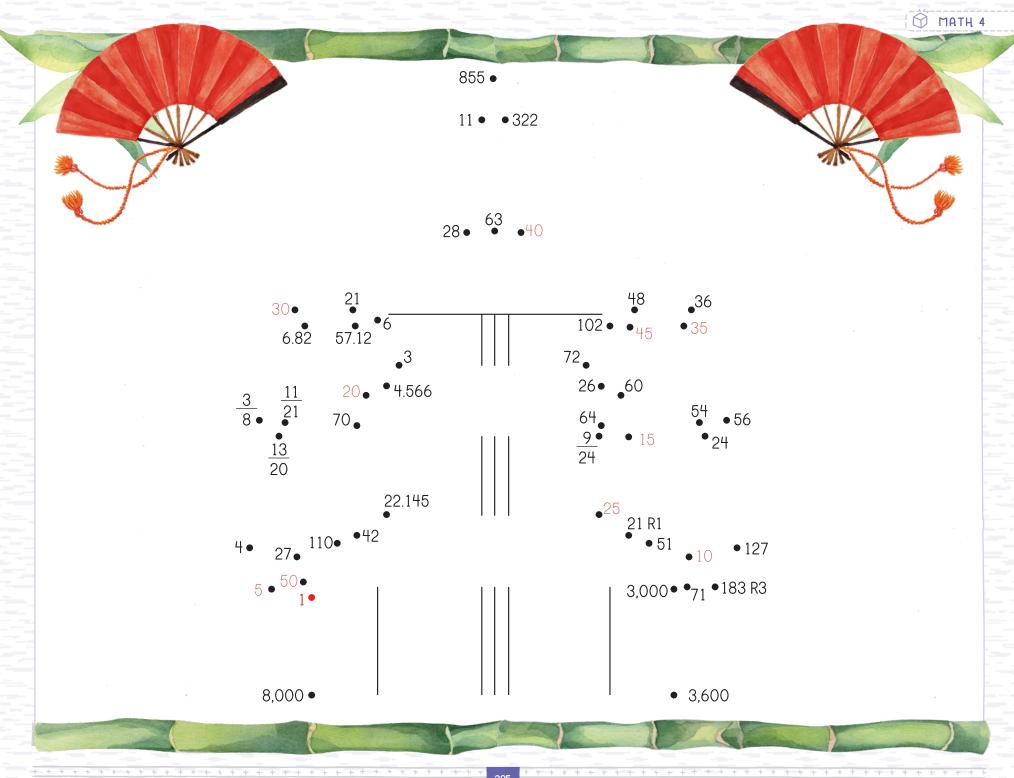
3. In the design above, triangle DEN is made up of line segments $\overline{DE}$, $\overline{EN}$, and $\overline{ND}$. Write the names of the three line segments that make up triangle ALH.

© Jenny Phillips

Dot•To•Dot Review

Complete each problem below. Then use the answers to complete the dot-to-dot picture on the next page. Start at the red number 1. Draw a line to the answer to Problem 2, and then draw a line to the answer to Problem 3. The numbers in red have been done for you; simply find that number on the dot-to-dot.

1. 1	**2.** $400 \times 20 =$	**3.** $12 \times 300 =$	**4.** $60 \times 50 =$	**5.** 5
6. IV -	**7.** XXVII -	**8.** CX -	**9.** LI -	**10.** 10
11. $2\overline{)254}$	**12.** $4\overline{)735}$	**13.** $5\overline{)355}$	**14.** $8\overline{)169}$	**15.** 15
16. $6 \times 4 =$	**17.** $8 \times 7 =$	**18.** $6 \times 9 =$	**19.** $5 \times 12 =$	**20.** 20
21. $\dfrac{1}{3} + \dfrac{4}{21} = \underline{}$	**22.** $\dfrac{7}{8} - \dfrac{1}{2} = \underline{}$	**23.** $\dfrac{9}{20} + \dfrac{1}{5} = \underline{}$	**24.** $\dfrac{4}{6} - \dfrac{7}{24} = \underline{}$	**25.** 25
26. $31.745 - 9.6 =$	**27.** $4.57 - 0.004 =$	**28.** $61.9 - 4.78 =$	**29.** $8.32 - 1.5 =$	**30.** 30
31. $3 \times 7 =$	**32.** $9 \times 7 =$	**33.** $12 \times 4 =$	**34.** $6 \times 6 =$	**35.** 35
36. 34 yd = _____ ft	**37.** 6 ft = _____ in	**38.** 30 mm = ____ cm	**39.** 600 cm = _____ m	**40.** 40
41. $23 \times 14 =$	**42.** $45 \times 19 =$	**43.** 27, 23, 19, 15, ____	**44.** 7, 14, 21, ____	**45.** 45
46. Radius = 13 cm Diameter = _____ cm	**47.** Radius = 32 ft Diameter = _____ ft	**48.** Radius = ____ in Diameter = 140 in	**49.** Radius = ____ m Diameter = 84 m	**50.** 50

855 •

11 •   • 322

28 • 63   • 40

30 •   21   48   36
  •   •   6   102 •   •   • 35
6.82   57.12   • 45
              72
              3
26   60
          4.566
$\frac{3}{8}$ $\frac{11}{21}$ 20   64   54
          70   $\frac{9}{24}$ • 15   • 56
$\frac{13}{20}$ 24

22.145

          25
4   27   110   42   21 R1
          • 51   • 10   • 127
5   50
  1 •   3,000 • 71 • 183 R3

8,000 •   • 3,600

UNIT 4 OVERVIEW

LESSONS 91-120

Extra Supplies Needed

- 2 standard dice
- 1 quarter
- colored pencils or crayons

New Concepts Taught

- add/subtract mixed numbers (uncommon denominators)
- compare decimal numbers to the thousandths place
- estimation (multiplication and division)
- long division (check quotients using multiplication)
- long division (decimal numbers)
- long division (two-digit divisor)
- mean, median, mode, and range
- mental math (multiplication)
- multiplication (decimal numbers)
- multiplication (three-digit by two-digit)
- percents
- round decimal numbers to the ones and tenths place
- short division
- write fractions and mixed numbers as decimals

Concepts Reviewed and Expanded Upon

- compare positive and negative numbers
- conversion (units of weight)
- coordinate graph
- fractions of a set
- identify positive and negative numbers

Parent/Teacher Tips

Students are not expected to completely master all the concepts taught in Unit 4, especially toward the end of the unit. Some concepts are presented to give the student familiarity with topics that will be taught and expanded on in Math 5.

Lesson 96

ADDING AND SUBTRACTING MIXED NUMBERS

✏️ Complete today's *Math 4 Mental Math Map Mysteries* activity.

✏️ Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4.
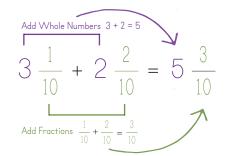
$$4\frac{3}{8} + 2\frac{1}{8} =$$
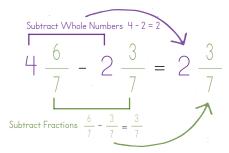
$$3\frac{4}{5} - 2\frac{2}{5} =$$

$$7\frac{2}{3} + 2\frac{1}{9} = \qquad 6\frac{4}{5} - 3\frac{3}{10} =$$

Mini Lesson

Adding and subtracting mixed numbers is similar to adding and subtracting fractions. In these two problems, the fractions have common denominators. For the addition problem, add the whole numbers, and then add the fractions. For the subtraction problem, subtract the whole numbers, and then subtract the fractions.

Add Whole Numbers 3 + 2 = 5

$$3\frac{1}{10} + 2\frac{2}{10} = 5\frac{3}{10}$$

Add Fractions $\frac{1}{10} + \frac{2}{10} = \frac{3}{10}$

Subtract Whole Numbers 4 − 2 = 2

$$4\frac{6}{7} - 2\frac{3}{7} = 2\frac{3}{7}$$

Subtract Fractions $\frac{6}{7} - \frac{3}{7} = \frac{3}{7}$

Sometimes the fraction parts will not have a common denominator. Before any addition or subtraction can take place, the fraction parts of the mixed numbers must have a common denominator. Once a common denominator is found, the mixed numbers can be added or subtracted by first adding or subtracting the whole numbers and then adding or subtracting the fractions.

$$2\frac{3}{8} + 1\frac{1}{2} =$$

In this problem the fractions do not have a common denominator. We must find a common denominator before adding.

$$\frac{1}{2} \xrightarrow{\times 4} \frac{4}{8}$$
$$\times 4$$

We find an equivalent fraction for one-half with a denominator of eight and replace one-half with four-eighths.

Add Whole Numbers 2 + 1 = 3

$$2\frac{3}{8} + 1\frac{4}{8} = 3\frac{7}{8}$$

Add Fractions $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$

$$5\frac{7}{9} - 2\frac{1}{3} =$$

In this problem the fractions do not have a common denominator. We must find a common denominator before subtracting.

$$\frac{1}{3} \xrightarrow{\times 3} \frac{3}{9}$$
$$\times 3$$

We find an equivalent fraction for one-third with a denominator of nine and replace one-third with three-ninths.

Subtract Whole Numbers 5 − 2 = 3

$$5\frac{7}{9} - 2\frac{3}{9} = 3\frac{4}{9}$$

Subtract Fractions $\frac{7}{9} - \frac{3}{9} = \frac{4}{9}$

$9\frac{1}{3} - 2\frac{1}{6}$

$4\frac{9}{10} - 2\frac{1}{5}$

$8\frac{10}{12} - 2\frac{4}{6}$

$2\frac{1}{9} + 2\frac{2}{3}$

$1\frac{1}{2} + 1\frac{1}{10}$

$5\frac{2}{3} - 1\frac{2}{9}$

$1\frac{1}{4} + 5\frac{4}{12}$

$3\frac{2}{6} + 4\frac{1}{2}$

$7\frac{5}{6}$

$4\frac{7}{9}$

$4\frac{4}{9}$

$2\frac{6}{10}$

$7\frac{1}{6}$

$2\frac{7}{10}$

$6\frac{2}{12}$

$6\frac{7}{12}$

Help each bird get back to its birdhouse by completing each problem and then drawing a line from the bird to the birdhouse with the correct answer.

Review

1. Complete each problem.

$$3 \overline{)2{,}275} \qquad 6 \overline{)517} \qquad 7 \overline{)492}$$

$$\begin{array}{r} 372 \\ \times\ 28 \\ \hline \end{array} \qquad \begin{array}{r} 693 \\ \times\ 18 \\ \hline \end{array} \qquad \begin{array}{r} 121 \\ \times\ 66 \\ \hline \end{array}$$

2. Continue each pattern.

24, 18, 12, ___ , ___ , ___ , ___

-35, -28, -21, -14, ___ , ___ , ___

11, 7, 3, -1, ___ , ___ , ___ , ___

-13, -9, -5, -1, ___ , ___ , ___ , ___

3. Round each decimal number to the nearest whole number.

24.8 ⬜   7.5 ⬜   58.6 ⬜
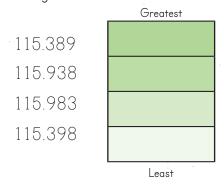
4. Arrange these decimal numbers from least to greatest.

Least

57.024
57.240
57.042
57.204

Greatest

5. Arrange these decimal numbers from greatest to least.

Greatest

115.389
115.938
115.983
115.398

Least

6. Find the perimeter and area of this square.

9 cm

7. List all the factors of 18. Hint: Find all the pairs of numbers that equal 18 when multiplied, and then list those factors from least to greatest.

8. List all the factors of 24.

9. List all the factors of 30.

$$4\overline{)32} \quad 7\overline{)56} \quad 5\overline{)30} \quad 12\overline{)72} \quad 8\overline{)64} \quad 4\overline{)28} \quad 6\overline{)42} \quad 12\overline{)108} \quad 9\overline{)81} \quad 9\overline{)45} \quad 7\overline{)63} \quad 12\overline{)84}$$

WREN BIRDHOUSE BLUEPRINTS

Materials

- Common board 1" × 6" × 3'
- Common board 1" × 5" × 3'
- #8 × 1 $\frac{3}{4}$" outdoor or galvanized screws (qty. 15)
- #108 square bend screw hook
- Power drill
- 1 $\frac{1}{8}$" wood-boring spade drill bit
- $\frac{3}{32}$" twist drill bit
- Handsaw (or chop saw)
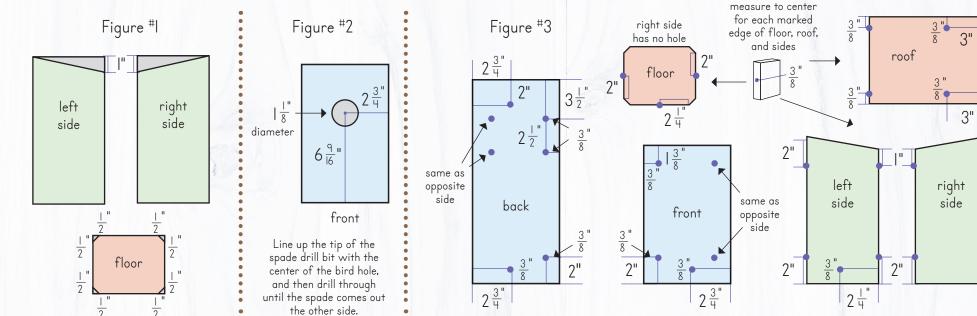
Cut List

24 $\frac{1}{4}$"

5"	10 $\frac{1}{8}$" side	10 $\frac{1}{8}$" side	4" floor	11 $\frac{3}{4}$" scrap

3'

31 $\frac{1}{2}$"

6"	14" back	9 $\frac{1}{2}$" front	8" roof	4 $\frac{1}{2}$" scrap

3'

HOME TWEET HOME

Preparation

1. Measure and cut pieces for birdhouse using a handsaw or chop saw (see cut list).
2. Measure and cut side piece angles and corners of floor piece (see figure #1).
3. Measure and mark center of bird hole. Use wood-boring spade to drill the hole (see figure #2).
4. Measure and mark screw holes. Predrill holes using twist drill bit (see figure #3).

Figure #1

left side

right side

1"

| $\frac{1}{2}$" | floor | $\frac{1}{2}$" |

$\frac{1}{2}$" $\frac{1}{2}$" $\frac{1}{2}$" $\frac{1}{2}$"

Figure #2

front

1 $\frac{1}{8}$" diameter

2 $\frac{3}{4}$"

6 $\frac{9}{16}$"

Line up the tip of the spade drill bit with the center of the bird hole, and then drill through until the spade comes out the other side.

Figure #3

right side has no hole

floor
2"
2"
2 $\frac{1}{4}$"

measure to center for each marked edge of floor, roof, and sides

$\frac{3}{8}$"

roof
3"
$\frac{3}{8}$" $\frac{3}{8}$"
$\frac{3}{8}$" $\frac{3}{8}$"
3"

back
2 $\frac{3}{4}$"
2"
3 $\frac{1}{2}$"
2 $\frac{1}{2}$"
$\frac{3}{8}$"
$\frac{3}{8}$"
2"
2 $\frac{3}{4}$"

same as opposite side

front
1 $\frac{3}{8}$"
$\frac{3}{8}$"
$\frac{3}{8}$"
2" $\frac{3}{8}$"
2 $\frac{3}{4}$"

same as opposite side

left side

right side

2"   1"   2"
2" $\frac{3}{8}$"   2"
2 $\frac{1}{4}$"

1. Attach back piece to left side. Make sure the left side's top slants down away from back piece.

back

left side

2. Attach right side to back. Drill screw into hole so it is not snug. This screw will act as a hinge.

right side

back

3. Slide floor piece in position. Drill screws into back and left side.

2"

$2\frac{1}{4}$"

left side

back

back

left side

4. Attach front to left side and floor. Drill screw into top hole only for right side, making sure it is not snug. This screw will act as another hinge.

left side

front

5. Attach roof to front, and then to back. There will be a $\frac{1}{4}$" gap between roof and top of sides to allow for airflow.

left side

back

$2\frac{1}{4}$"

2"

front

right side

back

left side

6. Use pliers to screw the square bend screw hook clockwise into bottom right hole on front piece. This will lock the right side in place. To unlock, twist screw counterclockwise enough so that the right side can be opened.

right side acts as a door

7. Attach birdhouse to tree, post, or fence. In early winter, ease the side door open to clean out old nests. Make sure there are no birds still living in the nest before removing it.
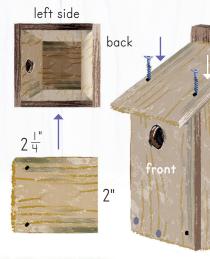
Lesson 109

PROBABILITY

Supplies
1 quarter

⚠ Complete today's *Math 4 Mental Math Map Mysteries* activity.

⚠ Watch the video lesson and/or read the mini lesson.

Video Lesson

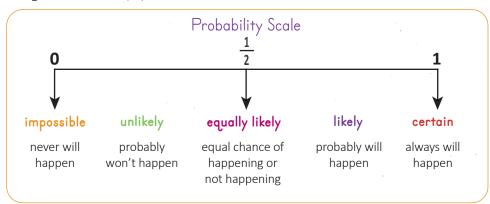Scan the QR code or watch the video lesson on goodandbeautiful.com /Math4.

⚠ There is no student practice section for this video.

Mini Lesson

Probability is the likelihood that an event will happen. Outcomes are the possible results of a probability experiment. The probability of an event can be expressed using the numbers 0, 1, or a fractional amount between 0 and 1.

Probability Scale

$$\frac{1}{2}$$

0   **1**

impossible	unlikely	equally likely	likely	certain
never will happen	probably won't happen	equal chance of happening or not happening	probably will happen	always will happen

Look at the scale above. When an event has a probability of 0, that means it is impossible. The event cannot happen. When an event has a probability of 1, that means it is certain. The event will definitely happen. An event is equally likely when it has an equal chance of happening or not happening. Equally likely events have a probability of $\frac{1}{2}$. An event is unlikely if the probability falls between 0 and $\frac{1}{2}$, and it is likely if the probability falls between $\frac{1}{2}$ and 1.

When we write a fraction to show probability, the number of desired outcomes is the numerator, and the number of possible outcomes is the denominator. This spinner has eight possible outcomes. Look at the probabilities listed below for each event.

Probability of spinning a number less than 10: $\frac{8}{8} = 1$

Probability of spinning a number greater than 20: $\frac{0}{8} = 0$

Probability of spinning an even number: $\frac{4}{8} = \frac{1}{2}$

Probability of spinning an odd number: $\frac{4}{8} = \frac{1}{2}$

Probability of spinning a number less than 3: $\frac{2}{8} = \frac{1}{4}$

Probability of spinning a number greater than 3: $\frac{5}{8}$

Lesson Practice

Read each scenario below, and then decide whether the probability of that event occurring is impossible, unlikely, likely, or certain.

1. I will eat dinner tonight.

   impossible　　unlikely　　likely　　certain

2. I will eat pizza for dinner tonight.

   impossible　　unlikely　　likely　　certain

3. Tomorrow will be Friday.

   impossible　　unlikely　　likely　　certain

4. Tomorrow I will read a book.

   impossible　　unlikely　　likely　　certain

5. I will do chores today.

   impossible　　unlikely　　likely　　certain

6. I will wash a car today.

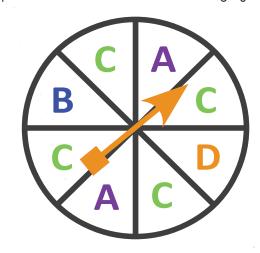   impossible　　unlikely　　likely　　certain

7. Someday I will learn to fly like a bird.

   impossible　　unlikely　　likely　　certain

8. Someday I will learn to drive a car.

   impossible　　unlikely　　likely　　certain

Use the spinner to answer the following questions.

1. What is the probability of landing on A? _____

2. What is the probability of landing on either A or C? _____

3. What is the probability of not landing on C? _____

4. Is there an equal chance of landing on B or D? _____

5. Is the spinner more likely to land on A or B? _____

6. What is the probability of not landing on C or D? _____

7. What is the probability of landing on E? _____

8. What is the probability of landing on D? _____

These toy cars are stored in this basket. Answer the questions below. Write your answers as a fraction when necessary.

1. Which color is most likely to be picked? _____

2. What is the probability of picking a yellow car? _____

3. What is the probability of picking a red car? _____

4. What is the probability of picking a blue car? _____

5. Which color is least likely to be picked? _____

6. What is the probability of picking a car that is not green? _____

7. What is the probability of picking a car that is not red? _____

8. What is the probability of picking a car that is blue, red, or green? _____

If you flip a quarter or drop it on a table, what is the probability that it will land heads up?

What is the probability that it will land tails up?

When you flip a coin, it is equally likely that it will land heads up or tails up. Let's test it out! You will flip a quarter, or drop it onto a table, 20 times and record the results on the chart below.

Make a prediction! Out of 20 flips, how many times do you think it will land heads up? _____ Tails up? _____

Flip #	Heads	Tails	Flip #	Heads	Tails
1			11		
2			12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

How many times did it land heads up?

How many times did it land tails up?
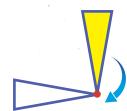
Were the results different than your prediction?
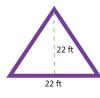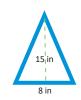
Review

1. Complete each conversion.

6 gal = _____ pt

5 qt = _____ c

8 pt = _____ qt

16 c = _____ gal

2. Find the area of each triangle.

$$\text{area} = \frac{\text{base} \times \text{height}}{2}$$

22 ft

22 ft

15 in

8 in

11 in

32 in
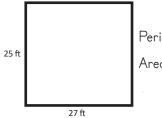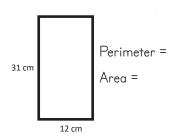
3. Find the perimeter and area of the shapes below.

25 ft

27 ft

Perimeter =

Area =

31 cm

12 cm

Perimeter =

Area =

4. Each yellow shape below has been rotated. Label each rotation with the direction and degree of the turn.

5. Convert each improper fraction to a mixed number.

$\frac{17}{6}$ $\frac{7}{2}$ $\frac{23}{4}$

6. Continue each pattern.

66, 55, 44, 33, ___, ___, ___   Rule: _____

103, 109, 115, ___, ___, ___   Rule: _____

24, 18, 12, 6, ___, ___, ___   Rule: _____

–25, –18, –11, –4, ___, ___, ___   Rule: _____

$12\overline{)36}$ $7\overline{)49}$ $4\overline{)16}$ $8\overline{)64}$ $7\overline{)63}$ $3\overline{)27}$ $9\overline{)81}$ $6\overline{)18}$ $4\overline{)20}$ $6\overline{)36}$ $12\overline{)72}$ $3\overline{)15}$

Lesson
114

AVERAGE AND MEAN

📖 Complete today's *Math 4 Mental Math Map Mysteries* activity.

✏️ Watch the video lesson and/or read the mini lesson.

Video Lesson

Scan the QR code or watch the video lesson on goodandbeautiful.com/Math4.

Joy

11, 10, 9, 10

Grace

13, 11, 9, 11

Mini Lesson

When we work with a group of numbers, it can be helpful to find the average of that group. An average is a number that represents a typical value in a group of numbers. One type of average is called the **mean**.

Look at this example. Suppose there are three boxes of pencils that each have a different number of pencils in them. The first box has 4 pencils, the second box has 3 pencils, and the third box has 5 pencils.

4   **3**   **5**

The mean is the number of pencils in each box if all the pencils were divided equally among the three boxes. To find the mean, the pencils can be rearranged to have an equal number in each box. Each box would have 4 pencils. The mean is 4.

4   **4**   **4**

Sometimes the mean is referred to as the average.

There are two steps for finding the mean of a group of numbers:

1. Find the sum of all the numbers in the group.
2. Divide the sum by the number of addends.

Look at the pencil box example again. The number of pencils in each box was 4, 3, and 5. To find the mean, first find the sum of these numbers.

$$4 + 3 + 5 = 12$$

Now divide the sum (12) by the number of addends. There are 3 numbers that we added, so divide 12 by 3.

$$12 ÷ 3 = 4$$

The mean is 4.

4   8   7   6   9   8

Find the mean of the children's ages above.

1. Find the sum of all the ages in the group.

$$4 + 8 + 7 + 6 + 9 + 8 = 42$$

2. Divide the sum by the number of addends, in this case the number of children.
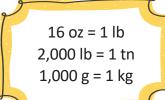
$$42 ÷ 6 = 7$$

The mean, or average age, for this group of children is 7 years old.

Lesson Practice

For each group of children below, find the mean of the children's ages by adding all the ages together and then dividing the sum by the number of children in the group.

7   3   5   5

8   7   5   12   9   8   5   2

11   10   12   9   13   11

5   7   12   9   2

10   13   10   12   14   11   16   10   9   15

Review

1. Complete each conversion.

16 oz = 1 lb
2,000 lb = 1 tn
1,000 g = 1 kg

5 tn = _____ lb

32 oz = _____ lb

8,000 lb = _____ tn

11 lb = _____ oz

3 kg = _____ g

12,000 g = _____ kg

2. Complete each problem. Write the decimal point in the quotient directly above the decimal point in the dividend.

$8\overline{)33.68}$ $5\overline{)6.75}$ $8\overline{)12.8}$

3. Complete each problem by multiplying and then writing the decimal point in the correct place.

$$\begin{array}{r} 42.7 \\ \times\ 12 \\ \hline \end{array}$$ $$\begin{array}{r} 3.457 \\ \times\ \ \ \ 5 \\ \hline \end{array}$$ $$\begin{array}{r} 2\ 2\ 7 \\ \times\ 3.4 \\ \hline \end{array}$$

4. Multiply each decimal number by moving the decimal point.

72.7 × 10 =

12.78 × 100 =

8.32 × 1,000 =

5. Convert each improper fraction to a mixed number.

$\dfrac{7}{4}$ $\dfrac{13}{8}$ $\dfrac{22}{5}$

6. Use the box to help answer the questions.

What is $\frac{2}{4}$ of 16?   What is $\frac{3}{4}$ of 16?

7. Round each decimal number to the nearest whole number.

72.14   3.71   67.35   42.33

8. Now round each decimal number to the nearest tenth.

72.14   3.71   67.35   42.33

Read with your parent or teacher

It's time to review Multiplication Set D using the Multiplication Mastery Chart on page 395 with your parent or teacher.

Parent/Teacher: Quiz your child on Set D facts and indicate which facts your child has mastered in the "Reviewed" column on page 395. Practice any missed facts.

Polygons

3	triangle
4	quadrilateral
5	pentagon
6	hexagon
7	heptagon
8	octagon
9	nonagon
10	decagon

Long Division

1. Divide ÷
2. Multiply ×
3. Subtract −
4. Bring Down ↓

Repeat

Conversions

Volume
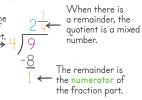
Weight

16 oz = 1 lb
2,000 lb = 1 tn
1,000 g = 1 kg

Length

1 km = 1,000 m	1 m = 100 cm
1 cm = 10 mm	1 m = 1,000 mm

12 inches = 1 foot	3 feet = 1 yard
36 inches = 1 yard	5,280 feet = 1 mile

Formulas

Area of a Rectangle
Area = Length × Width

Area of a Triangle
$$Area = \frac{Base \times Height}{2}$$

Volume of a Rectangular Prism
Volume = Length × Width × Height

Improper Fractions

$$\frac{9}{4}$$
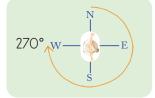
The divisor is the **denominator** of the fraction part.

$$4 \overline{)\begin{array}{l} 2\frac{1}{4} \\ 9 \\ -8 \\ \hline 1 \end{array}}$$

When there is a remainder, the quotient is a mixed number.

The remainder is the **numerator** of the fraction part.

$$2\frac{1}{4}$$

Transformations

Translation

Rotation

Reflection

Order of Operations

(Please)
Excuse^2
My × Dear ÷
Aunt + Sally −

Roman Numerals

1	I	50	L
2	II	100	C
3	III	500	D
4	IV	1,000	M
5	V	67	LXVII
6	VI	250	CCL
7	VII	501	DI
8	VIII	620	DCXX
9	IX	705	DCCV
10	X	916	CMXVI

Measuring Turns

360°

270°

180°

90°

Angle Classification

Acute
less than 90°

Right
90°

Obtuse
between 90° & 180°

Straight
180°

MULTIPLICATION
Mastery Chart

Set A	Mastered	Reviewed
3 × 3		
6 × 6		
5 × 3		
8 × 4		
8 × 8		
3 × 4		
5 × 5		
9 × 9		
6 × 4		
3 × 5		
4 × 8		
4 × 3		
4 × 6		

Set B	Mastered	Reviewed
4 × 4		
4 × 5		
7 × 3		
7 × 4		
8 × 5		
8 × 7		
9 × 3		
9 × 4		
9 × 5		
5 × 4		
3 × 7		
4 × 7		
5 × 8		
7 × 8		
3 × 9		
4 × 9		
5 × 9		

Set C	Mastered	Reviewed
5 × 6		
5 × 7		
6 × 3		
6 × 8		
7 × 6		
7 × 7		
7 × 9		
8 × 3		
9 × 6		
9 × 8		
6 × 5		
7 × 5		
3 × 6		
8 × 6		
6 × 7		
9 × 7		
3 × 8		
6 × 9		
8 × 9		

Set D	Mastered	Reviewed
12 × 3		
12 × 4		
12 × 5		
12 × 6		
12 × 7		
12 × 8		
12 × 9		
12 × 11		
12 × 12		
3 × 12		
4 × 12		
5 × 12		
6 × 12		
7 × 12		
8 × 12		
9 × 12		
11 × 12		

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