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# MATH

## In the Utah Core State Standards for fourth grade there are three critical areas.

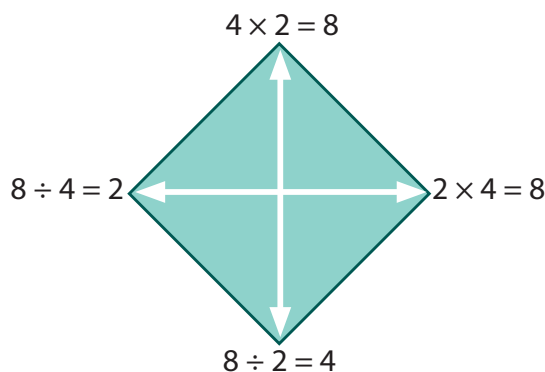
The critical areas define what students should know and understand (conceptual understanding), and be able to do (procedural understanding and fluency).

### CRITICAL AREA ONE: By the end of fourth grade, students should:

1. Understand place value up to 1,000,000 and know the value of each number in each place.
2. Be able to compute products (answers to multiplication problems) and quotients (answers to division problems) of whole numbers with multiple digits by applying what they learned in previous grades.
3. Understand that multiplication and division are opposite operations; that is, multiplication and division reverse each other.
4. Estimate and mentally calculate products ( $\times$ ) and quotients ( $\div$ ).
5. Become fluent with procedures for multiplying and dividing whole numbers efficiently.
6. Understand and explain why multiplication and division procedures work.
7. Solve problems using multiplication and division procedures.
8. Know how to describe what a division remainder means depending on the context of the problem.

#### Examples:

1.  $56 \times 20 = \underline{\quad}$ . Using the distributive property,  $(50 \times 20) + (6 \times 20) = \underline{\quad}$ .
2. Fact families show the relationship between operations:



3. Estimate the product of  $56 \times 20$ .
4. A 17-inch-long piece of rope is cut into 2-inch pieces. How many 2-inch pieces are there? How much of the rope is left?

# 2

## CRITICAL AREA TWO: By the end of fourth grade, students should:

1. Understand how different fractions can be equivalent. They will develop ways of recognizing and generating equivalent fractions.
2. Understand that fractions can be compared, added, subtracted, and multiplied, and perform those operations.
3. Be able to use understanding of unit fractions, e.g.,  $\frac{1}{4}$ ,  $\frac{1}{6}$ ,  $\frac{1}{3}$ , to compose (build) fractions from unit fractions, and to decompose (break into parts) fractions into unit fractions.
4. Be able to multiply a fraction by a whole number.

### Examples:

1.  $\frac{15}{9} = \underline{\hspace{2cm}}$ .                      What is an equivalent fraction for  $\frac{4}{10}$  ?
2.  $\frac{5}{6} - \frac{3}{6} = \underline{\hspace{2cm}}$ .                       $2\frac{4}{5} - 1\frac{2}{5} = \underline{\hspace{2cm}}$ .
3. A cake recipe calls for  $\frac{3}{4}$  cup of milk,  $\frac{1}{4}$  cup of oil, and  $\frac{2}{4}$  cup of water. How much liquid was needed to make the cake? Justify your answer.
4. Composing:  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \underline{\hspace{2cm}}$ .      Decomposing:  $\frac{3}{6} = \frac{?}{6} + \frac{?}{6} + \frac{?}{6}$
5. Kathy is having a party. She wants  $\frac{2}{3}$  cup of trail mix per guest. She expects 6 guests. How much trail mix should Kathy prepare? Write an equation and justify your solution with a visual model.

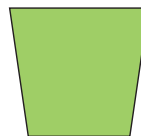
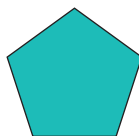
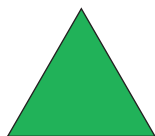
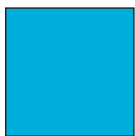
# 3

## CRITICAL AREA THREE: By the end of fourth grade, students should:

1. Describe, analyze, compare, and classify two-dimensional shapes.
2. Deepen their understanding of two-dimensional shapes and their characteristics (properties).
3. Use two-dimensional shapes to solve problems involving line symmetry (the shape is the same on both sides of the line).

### Examples:

1. Identify which of these shapes have perpendicular or parallel sides, and justify your selection.



2. Use lines, angles (right, acute, obtuse, straight), parallel and perpendicular lines to build two-dimensional shapes. Describe their properties.
3. Use pattern blocks, tangrams, or pentaminoes to create a figure that has at least one line of symmetry. Draw a two-dimensional replica of that figure showing the lines of symmetry.

## AT HOME

Parents should act as resources and supports for homework help. They should never do the homework themselves. The tips below come from the National Council of Teachers of Mathematics Homework Tips webpage (<http://www.nctm.org/resources/content.aspx?id=2876>).

### TIPS FOR FAMILIES – HOMEWORK HELP

#### Math Homework Is Due Tomorrow—How Can I Help?

Homework causes trouble in many households. Relax—remember whose homework it is! Think of yourself as more of a guide than a teacher. Don't take over for your child. Doing that only encourages him or her to give up easily or to ask for help when a problem becomes difficult.

The best thing you can do is ask questions. Then listen to what your child says. Often, simply explaining something out loud can help your child figure out the problem. Encourage your child to show all work, complete with written descriptions of all thinking processes. This record will give your child something to look back on, either to review or to fix a mistake, and can also help the teacher understand how the problem was solved.

#### Asking the following kinds of questions can help you and your child tackle the challenges of math homework:

- What is the problem that you're working on?
- Are there instructions or directions? What do they say?
- Are there words in the directions or the problem that you do not understand?
- Where do you think you should begin?
- Is there anything that you already know that can help you work through the problem?
- What have you done so far?
- Can you find help in your textbook or notes?
- Do you have other problems like this one? Can we look at one of those together?
- Can you draw a picture or make a diagram to show how you solved a problem like this one?
- What is your teacher asking you to do? Can you explain it to me?
- Can you tell me where you are stuck?
- Is there someone you can call to get help? Can you discuss the problem with a classmate?
- Would using a calculator help you solve the problem?
- Would it help to go on to another problem and come back to this one later?
- Is there a homework hotline at your school? What is the phone number for it?
- Why don't we look for some help on the Internet?
- If you do only part of a problem, will the teacher give you some credit?
- Can you go in before or after school for help from the teacher?

#### Remember, *support* homework—don't do it!

- ▶ Besides supporting your child on homework, show the importance of learning math by helping your child **connect math with daily life**.
- ▶ Point out **your own activities that involve mathematics**, such as deciding whether you have enough money to buy items on a shopping list, estimating how long it will take to make a trip, determining how much carpet or wallpaper to buy for a room, or developing a schedule to complete a series of tasks.
- ▶ Talking about these everyday situations will give you a chance to increase your child's **appreciation for the usefulness of mathematics**.

Other tips for parents can be found at: <http://www.nctm.org/resources/content.aspx?id=7928>