PARENT GUIDE

MATH Grade 3

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In the Utah Core State Standards for third grade there are four 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 third grade, students should:

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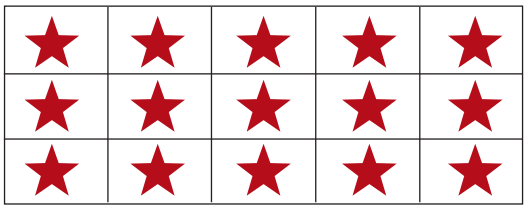
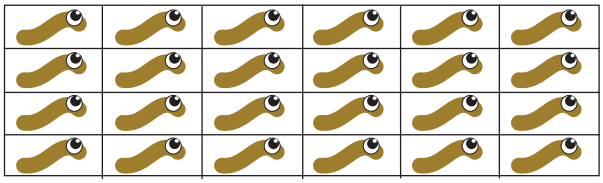
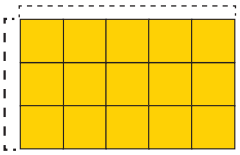
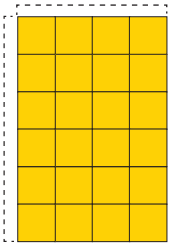
1. Understand the meaning of multiplication and division.
2. Work through activities and problems involving equal-sized groups, arrays, and area models.
3. Understand the relationship between multiplication and division.

Examples:

1. Multiplication is finding an unknown product. 3 x 5 = ___
   Division is finding an unknown factor. ___ x 6 = 24 (same as 24 ÷ 6 = ___)

	MULTIPLICATION	DIVISION
Equal-sized groups	The product of 3 groups of 5 objects 3 *x* 5 = ___ 3 hands with 5 fingers on each hand, models a product of 15 total fingers.	The missing factor of 24 objects shared with 6 groups ___ *x* 6 = 24 (same as 24 ÷ 6 = _____) Rodrigo has 24 cupcakes. He wants to evenly divide them into six boxes. How many cupcakes will he put in each box?
Arrays (organized patterns like rows and columns)	The product of objects evenly distributed into 3 rows and 5 columns:  3 *x* 5 = _____ 3 rows of apples with 5 in each row models the product of 15 apples.	The missing factor of 24 objects placed in 6 equal-sized columns: Darla is arranging a display for her teacher. There are 24 worm pictures in the display. Her teacher wants 6 pictures in each row. How many columns of pictures will she need to create? Draw an array to represent the problem, and then create an equation. ___ *x* 6 = 24 *(same as 24 ÷ 6 = _____)* Possible array: 4 rows of 6 pictures each = 24 pictures 
Area models (using the area of a rectangle to model multiplication)	The product of square units distributed into 3 rows and 5 columns: 5 3  Square tiles positioned 3 up and 5 across models the product of 15 total tiles. 3 *x* 5 = ___	The missing factor of 24 total tiles in 6 equal rows: ? 6  24 tiles positioned in 6 rows models the missing factor of 4 in each row. 6 *x* ___ = 24 (same as 24 ÷ 6 = ___)

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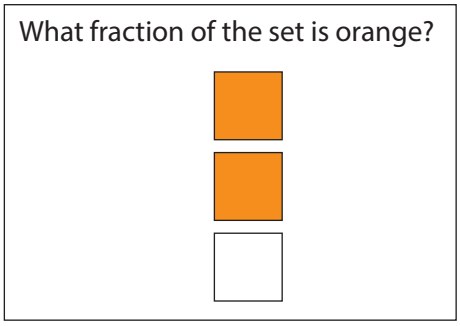
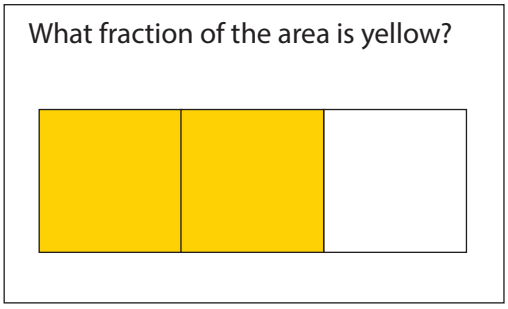
CRITICAL AREA TWO: By the end of third grade, students should:

1. Develop understanding of fractions with denominators limited to 2, 3, 4, 6, 8.
   - **a.** Start with unit fractions.
   - **b.** Non-unit fractions are built of unit fractions.
   - **c.** Use fractions and visual models to represent parts of a whole.
   - **d.** Understand that the size of a fractional part is related to the size of the whole.
2. Use fractions to represent numbers equal to, less than, and greater than one.
3. Be able to solve problems comparing fractions.

Examples:

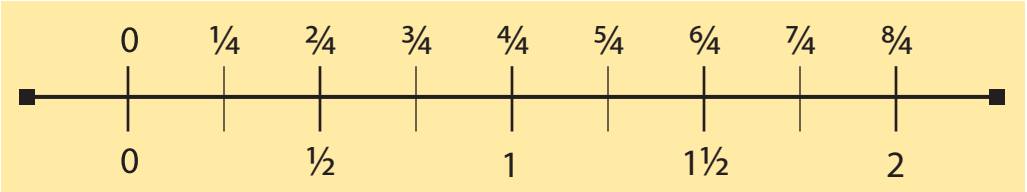
1. Using unit fractions and visual fraction models.
   - **a.** Unit fractions are fractions with a numerator of one. For example, ¼, ½, and ⅓ are unit fractions.
   - **b.** The fraction ¾ = ¼ + ¼ + ¼ where ¼ represents one unit of a whole shape divided into 4 equal parts.
   - **c.** Visual models for the fraction ⅔.





   - **d.** Fraction amounts differ according to the size of the whole. As shown below, the fractional halves do not cover the same area, but each is still ½ of the whole shape.

2. This example uses a number line model to represent fractions equivalent to numbers less than one, more than one and equal to one.



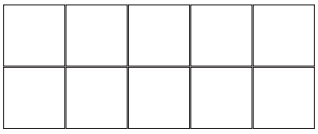
3. My friend and I each had the same-sized chocolate candy bar. I ate ½ of mine and my friend ate ⅓ of his. Who ate more? How do you know?

3 CRITICAL AREA THREE: By the end of third grade, students should:

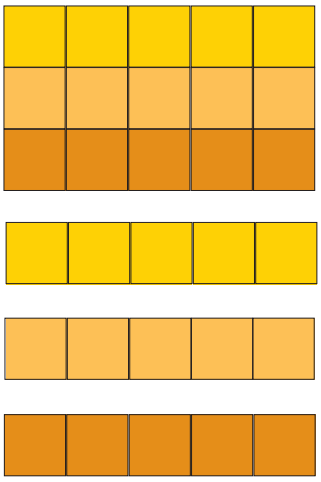
1. Recognize area as an attribute of two-dimensional shapes.
2. Measure the area of a shape:
   - **a.** Find the total number of same-sized square units e.g., inches, centimeters, needed to cover the shape with no gaps or overlaps.
   - **b.** One square unit is the standard unit of measure.
3. Understand that rectangular arrays (organized patterns like rows and columns) can be decomposed (taken apart) into identical rows or columns.
   - **a.** Use decomposition of arrays into rectangular arrays of squares to connect area to multiplication.

Examples:

1. Area is the measure, in square units, of the inside of a two-dimensional figure.
   The area of the figure below is 10 square units.



2. How many one-inch squares would it take to cover a sheet of paper?
3. An array of squares with 3 rows and 5 columns can be decomposed (taken apart) into 3 rows of 5 square units as shown below. Each row represents a group of 5 and can be used to model skip counting by 5, as row 1 = 5, row 2 = 10 and row 3 = 15 in the counting process.



The same could be done vertically to reveal columns of 3 and skip counting by 3.

4 CRITICAL AREA FOUR: By the end of third grade, students should:

1. Describe, analyze and compare properties of two-dimensional shapes.
2. Compare and classify shapes by their sides and angle.
3. Relate the fractions they are learning to geometry by expressing the area of part of a shape as a unit fraction of the whole shape.

Examples:

1. Describe a rhombus, a square, a rectangle, a trapezoid, a triangle, a hexagon, etc. Compare the number of sides of given shapes.
2. Show examples of several 4-sided figures. What do these shapes have in common?
3. Compare a triangle to a square. How are they similar? How are they different?
4. Draw examples of different quadrilaterals. Given different shapes, have students group them by similar angles.
5. Cut a rectangle diagonally. Ask students to show that they are each the same size. These new triangles now represent ½ of the rectangle.
6. What are all the ways you can divide a rectangular birthday cake into 8 equal parts (eighths).
7. Shapes can be partitioned (divided) into fractions in many different ways. The following squares are all divided into four equal parts.

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**