MATH NEWS

Grade 4, Module 3, Topic E — December 2013

4th Grade Math

Module 3: Multi-Digit Multiplication and Division

Math Parent Letter

This document is created to give parents and students a better understanding of the math concepts found in Eureka Math (© 2013 Common Core, Inc.) that is also posted as the Engage New York material which is taught in the classroom. Module 3 of Eureka Math (Engage New York) covers Multi-Digit Multiplication and Division. This newsletter will discuss Module 3, Topic E.

Topic E. Division of Tens and Ones with Successive Remainders

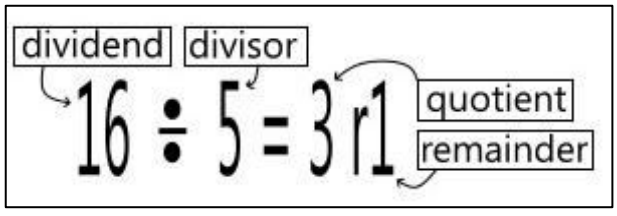
Words to know

- dividend
- divisor
- quotient
- remainder
- array
- number bond
- area model
- standard division
- tape diagram
- place value chart

Things to remember!!!

Always label your work when creating an area model.

The **remainder** represents the amount left over after dividing. For example 16 cannot be divided exactly by 5. The closest you can get without going over is 5 x 3 =15 which is 1 less than 16. 16 ÷ 5 = 3 r1



Place Value Disks are circles with a number written inside of them in order to represent place value. (1) represents ones place, (10) represents tens place and (100) represents hundreds place.

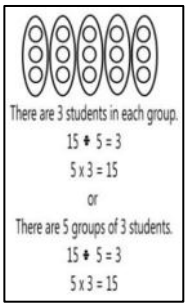
Focus Area– Topic E

Division of Tens and Ones with Successive Remainders

Modeling a Division Problem

There are 15 students in Science class separated into 5 groups. How many students are in each group?

Model with an Array



How many students all together? 15

How many groups of students? 5

How many per group? 3

Start by creating the 5 groups, draw 5 larger circles. Next ask yourself "Do I have enough to give every group one student?" Yes, you can place one student in each group. Continue until there are no more students to group. 15 has no remainder when divided into 5 groups. To check your work skip count by 5's to 15. 5, 10, 15. Or 5 x 3 = 15

Objective of Topic E

1. Solve division word problems with remainders.
2. Understand and solve division problems with a remainder using the array and area model.
3. Understand and solve two-digit dividend division problems with a remainder in the ones place by using number disks.
4. Represent and solve division problems requiring decomposing a remainder in the tens.
5. Find whole number quotients and remainders.
6. Explain remainders by using place value and understanding and models.
7. Solve division problems without remainders using the area model.
8. Solve division problems with remainders using the area model.

Modeling a Division Problem with Remainders

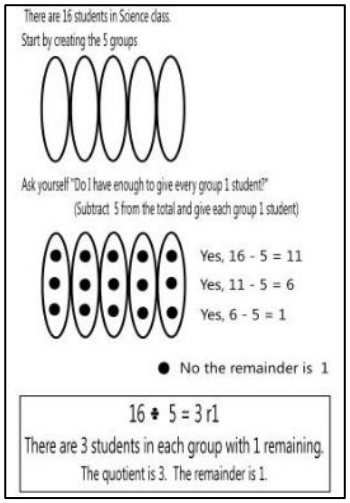
In Lesson 14 students will represent a division problem using an array, a number bond, and a tape diagram.

There are 16 students in a Science class separated into 5 groups. How many students are in each group?

Three important questions

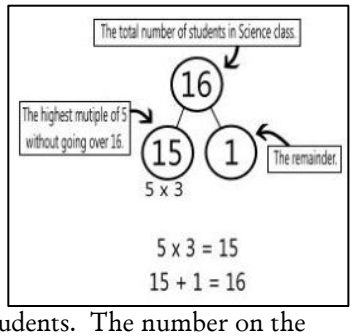
How many students all together? How many groups of students? How many per group?

Represent using an ***array***



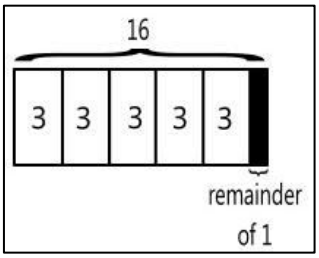
Start by creating the 5 groups, draw 5 larger circles. Next ask yourself "Do I have enough to give every group one student?" Yes, you can place one student in each group. There were 16, 1 student was placed in each group, so 16 – 5 = 11. There are 11 students that still need to be placed into groups. Continue this process until each student is placed. The 1 left is the remainder.

Represent using a ***number bond***



The top circle is always the total number, in this case 16. The number on the left is always groups that can be made. This number will always be the highest multiple of the group. 15 is the largest multiple of 5, which does not go over the total number of students. The number on the right is always the remainder. The amount left over after the number is divided evenly.

Represent using a ***tape diagram***

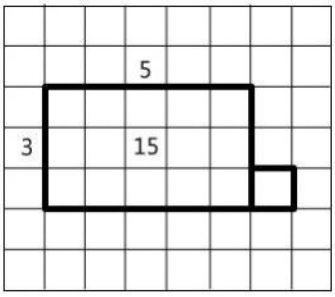


The tape diagram is similar to the array, instead of circles there are numerals. In this tape diagram the bar is separated into 5 sets of 3's. Skip count by three 5 times. 3, 6, 9, 12, 15. 15 plus the remainder of 1. 15 + 1 = 16. That is the number of students the Science class. This is a way that the answer can be checked. Another way is to multiply. 5 x 3 = 15 Next add the remainder. 15 + 1 = 16. These are great ways to check your work.

Modeling a Division Problem with Remainders

In Lesson 15 students will represent a division problem using an area model.

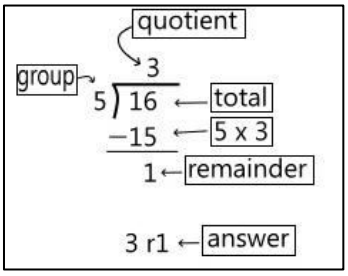
Represent using an ***area model***



An area model is faster to draw and it represents the same division problem. The total number is 16. That is the area of the model. The number of groups is 5. That is the length or the width of the area model. Mark off squares 5 at a time, count 5, 10, 15. Now we have to represent the remainder. Draw one more box to represent the remainder of 1. The total number of squares is 16. The **quotient** is 3 the **remainder** is 1.

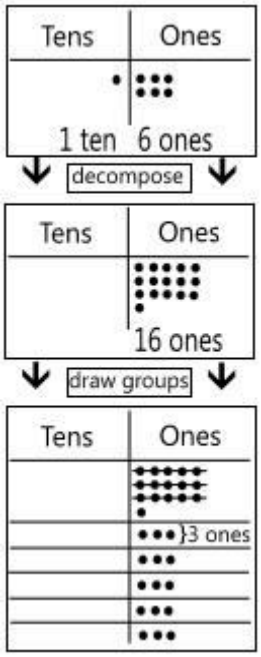
In Lesson 16 students will represent a division problem using standard division and a place value chart.

Represent using ***standard division***



Standard division is just dividing using numerals. What number can be multiplied by 5 and is the closest to 16? 3. 5 x 3 = 15, write that number below the 16. Subtract 16 – 15 = 1. 5 cannot be divided into 1 so this is your remainder.

Represent using ***place value chart***



Divide the bottom of the place value chart into the number of groups needed. For this problem it is divided into 5 groups. Start with the largest place value group, you have 1 ten. Can I separate 1 ten into 5 groups? No, so we decompose the 1 ten into 10 ones. Now fair share the 16 ones into the 5 groups. Remember to mark off each one as you place it in a group. There are 3 ones in each group and 1 remaining which has not been placed in a group. The answer is 3 r1 or 3 remainder 1.