Learning Experience:

_____Division_____

When planning, include the following:

Models (Concrete—Semi-Concrete—Semi-Abstract—Abstract)

Problems/Situations

Questions

AKS:
NBT.6 Calculate whole number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain division calculations by using equations, rectangular arrays, and/or area models.

Vertical Alignment:

3rd Grade:

• Use arrays and area models to develop an understanding of the distributive property, to determine partial products, and to multiply a 2- or 3-digit number by a 1-digit number.
• Understand the relationship between division and multiplication, division and subtraction
• Recognize the two situations of division
• Explain meaning of remainder
• Divide a 2- or 3-digit number by a 1-digit number
• Write mathematical expressions for division problem-solving situations
• Use mental math and estimation
• Solve problems requiring multiplication and division

5rd Grade:

• Model and explain multiplication and division of decimals
• Multiply and divide with decimals (including less than one and greater than one)
• Represent division of whole numbers as fractions
• Model multiplication and division of common fractions
• Understand the relationships/rules for multiplication/division of whole numbers apply to decimals
• Use mental math and estimation

Standards for Mathematical Practice:

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
6. **Attend to precision.**
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

Materials:

Base Ten Blocks
Mimio
Counters
Math journals
Chart paper
Math literature (see list below of titles to use)

Vocabulary:

- Factor
- Multiple
- Divisor
- Dividend
- Quotient
- Remainder
- Equations
- Calculations
- Rectangular arrays
- Area models

Essential Question:

How do I find quotients and remainders? How do I use strategies to help me divide?

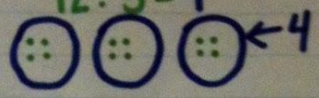
Activating Strategy:

Vocabulary word splash: Start with a quick word splash of division terms on chart paper and discuss terms briefly. As your division unit continues, use this chart and add to it. See the following chart for an example.

Strategies

Circles and Dots

12÷3=4



Turn the divisor into groups (circles). Divide the dividend into the circles. Count how many are in 1 circle!

Repeated Subtraction

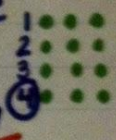
12÷3=4

12-3=9 Subtract
9-3=6 the
6-3=3 divisor
3-3=0 until you get 0.

count how many times you subtracted.

Array

12÷3=4



count by the divisor until you get the dividend.

count the rows to get the quotient!

Division

÷ / ⌐ symbols

Quotient

the answer to a division problem

12÷3=4

Divisor

the number you divide by

12÷3=4

Dividend

the number you are dividing

12÷3=4

Vocabulary

Multiplication and Division are the opposite of each other!

Fact Family

12÷3=4

12÷4=3

Start with the bigger #

end with the bigger #

4×3=12

3×4=12

Read any of the following books as your opener:
The Doorbell Rang (easy)
The Great Divide by Suzanne Slade
Divide and Ride
Spaghetti and Meatballs for All by Marilyn Burns (more challenging)

Instructional Activity:
Start by having students make basic arrays using manipulatives (Ex: 4 by 5).
Discuss the relationship to division.
How many rows are there? How many columns are there? If we divide our array into 4 rows, how many columns will there be?

MOCC: Hands on Standards, Grades 3-4, Numbers and Operations, Lesson 12: Dividing with One-Digit divisors (need base-ten blocks)

Equations:
Study Jams mini lesson: single digit divisor
http://studyjams.scholastic.com/studyjams/jams/math/multiplication-division/single-digit-division.htm

Arrays:
Division Arrays game:
http://www.onekama.k12.mi.us/bjbrown/02-03/division_arrays_game.htm

Mimioconnect.com: "Division Array"

Area Models:
Watch You Tube: "Open Arrays in Division.m4v"
Division Split activity:
http://troupp-5ccgps.homestead.com/Grade_Level_Files/Fourth/Math/MathPage.html
Click on: **Moving Through Concrete, Representational, Abstract**, then NBT 5and6

Intervention:

MOCC: Hands On Standard, Grades 3-4, Lesson 11: Exploring Division (need counters)

Expanding/extending the experience:

- Partial quotients: MOCC powerpoint

- Enrichment example (two digit divisor): Khan Academy
  Partial Quotient Division : An alternate to traditional long division
  http://www.khanacademy.org/math/arithmetic/multiplication-division/v/partial-quotient-division
- Additional Resources:
  - Think Math
  - Harcourt
  - Hands On Standards
    - 3-4: Lesson 12
  - Super Source: Base ten blocks
    - 3-4: "It's In the Bag"
    - 5-6: "Fair Shares"
- Troup County common core lessons

Summarizing/Assessment Questions:

- Each year our school has a field day where students rotate between 7 different activities. If the physical education teacher divides the 434 students evenly between the activities, how many students will there be at each activity? Will there be any students left out? Justify your answer.

- Write three different division problems with a quotient of 4 R3. Choose one of your problems and explain how you know it's correct.

- Candies can be packed in boxes of 2,3,5, and 6. Zowie Candy Company has 642 candies to box. The same size box must be used for all the candies and no candies can be left over. Which boxes could be used? Explain your thinking.

- Your task is to write three division problems. First, write a problem that you consider to be easy to solve. Next, write a problem you think is of medium difficulty. Finally, write a problem that you feel is hard. Solve all three.

- In your math journal, solve the equation: 486/5
  Solve and explain using one of the methods learned.

Did your plans you include the following?

Models (Concrete—Semi-Concrete—Semi-Abstract—Abstract)

Problems/Situations

Questions