**Multiplication and Division Study Guide**

In Math, we are learning all about Multiplication and Division! These skills are crucial to solve problems on the CRCT in 4th and 5th grade. Most of the math that we will be doing from now until the end of the school year will involve multiplication and division. When I was in 4th grade, there was one method for multiplication of numbers and long division. While this method has been taught to the students, other methods have been introduced. In order to assist your students, I would like to share these with you as well. One method is called the Lattice Method. I will do the multiplication example below in both the “long” method and the lattice method. My example will be using 25 x 87.

**Multiplication of a two-digit by two-digit number:**

Step 1: 7 x 5 = 35. Place the 5 in the ones place and carry the 3 to the tens column.

Step 2: Multiply 7 x 2 = 14 and add the 3; 14 + 3 = 17.

Step 3: Place a zero below the five of the 175 to hold your ones place. In step three we are essentially multiplying 25 x 80; however, placing a 0 in the ones place will hold this spot and allow us to multiply 25 x 8.

Step 4: with a 0 holding the ones place, multiply 8 x 5 = 40. Place the 0 in the tens column and carry your four. It may help to cross out the three to remember which number you are carrying on this set.

Step 5: 8 x 2 = 16 and add 4; 16 + 4 = 20. Put the 20 in front of the first two zeros. Add the two lines together to get your final answer of 2,175.

4 ~~3~~

25

x 87

175

+ 2000

2,175

**Multiplication of a two-digit by two-digit number using the Lattice Method:**

6

1

Step 1: Place the first number, 25, above the first two boxes, place the second number (87) down the left side by the boxes.

Step 2: multiply 2 x 8 and place the answer inside the box that aligns with those two numbers. The tens column will go on the left side of the angled line and the ones column will go on the right side of the angled line. 2 x 8 = 16, so it will look like this 🡪

Step 3: You continue these steps, multiplying 2 x 7 = 14, 5 x 8 = 40, and 5 x 7 = 35.

Step 4: Add the numbers “down” the lines. You will only put the ones in the column below, and you carry the tens place to the next diagonal column. These numbers will provide you with the answer, when placed in order.

5

2

The answer is 2,175.



1

5

7

1

2

5

3

4

1

0

4

7

8

6

1

Note: the Long Way & Lattice Method can be used to multiply 3-digit by 2-digit, 3-digit by 3-digit, etc. With a 3 x 3 number using the long method, remember to hold your ones place when multiplying by the tens digit, then hold your ones and tens place with zeros when multiplying by your hundreds digit. For lattice, you will need the same number of boxes as digits.

**Long Division**

There are three sayings that seem to help the students remember the steps of long division. Some students have turned the saying into a rhythmic saying while other students developed a cheer to go along with it. Whatever it takes to remember a saying is great! One saying is Dirty Monkey Smell Bad. These are the four steps of long division. D is for Divide, M is for Multiply, S is for Subtract and B is for Bring Down. The other saying contains an additional step. It is Does McDonald’s Sell Cheese Burgers. The steps are D is for Divide, M is for Multiply, S is for Subtract C is for Check and B is for Bring Down These steps are repeated until there is nothing left to bring down and all numbers have been divided into. While this will sometimes provide us with a remainder, in 5th grade, we teach the students to add a decimal place to the original number to complete the division process.

**Dividing 145 by 5 (example 1)**

Step 1: Divide 5 into 14 (not 145, it is too big). To do this, the students must know their multiplication tables. (5 x 1 = 5, 5 x 2 = 10, 5 x 3 = 15) Since 5 x 3 = 15, 5 will only go into 14 two times. Place the 2 above the 4 since we are working with 14.

Step 2: Multiply 2 x 5 = 10. Write 10 below the 14.

Step 3: Subtract; 14 – 10 = 4.

Step 4: Bring Down; bring down the 5 beside the 4. Now we repeat.

Step 5: Divide 5 into 45 (5 x 7 = 35, 5 x 8 = 40, 5 x 9 = 45, 5 x 10 = 50). 5 will go into 45 nine times. Place the 9 above the 5.

Step 6: Multiply 9 x 5 = 45. Write 45 below the 45.

Step 7: Subtract; 45 – 45 = 0. This means we are through! The answer is 29.

**Dividing 149 by 5 (this will leave us with a remainder) (example 2)**

Steps 1 – 3 will be the same as above.

Step 4 will also be to Bring Down, but this time, we will bring down a 9.

Step 5: Divide 5 into 49. Place a 9 above the 5.

Step 6: Multiply 9 x 5 = 45. Write the 45 below the 49.

Step 7: Subtract; 49 – 45 = 4. Since 5 will not divide into 4, then our answer is 29 R 4 (29 with a remainder of 4).

**Dividing 149 by 5 (adding a decimal place) (example 3)**

Steps 1 – 6 will be the same as the remainder example.

Step 7: Subtract; 49 – 45 = 4. However, instead of having a remainder, we will add a decimal point and a zero after 149.

Step 8: Bring Down; Bring the zero from after the decimal point down beside the 4.

Step 9: Divide 5 into 40 (5 x 7 = 35, 5 x 8 = 40, 5 x 9 = 45, 5 x 10 = 50). 5 will go into 40 eight times. Place the 8 above the 0. Remember to put your decimal place exactly above the decimal point in the problem!

Step 6: Multiply 8 x 5 = 40. Write 40 below the 40.

Step 7: Subtract; 40 – 40 = 0. This means we are through! The answer is 29.8.

29 29 R 4 29.8

5 145 5 149 5 149.0

-10 -10 -10

45 49 49

- 45 - 45 - 45

0 4 40

- 40

0