Unit 4 Study Guide from Miss Vermeulen

Shift Patterns and Multiplication with Decimals

Main Concepts covered this unit:

When multiplying a whole number by a power of 10, you can use shift patterns to quickly find the product

- When a factor is 10, 100, or 1,000: Multiply as if the factor was just "1" then shift the digits in the product to the left as many places as there are zeros
    - 10 x 7 = 70

      (think 1 x 7 is 7, then shift product one place to the left)
    - 100 x 7 = 700
    - 1,000 x 7 = 7,000
- When a factor is 10^1, 10^2, or 10^3: These factors shift your product the same as above. The exponent tells you how many places to move it.
    - 10^1 x 7 = 70 (notice the product is **not** 7!)
    - 10^2 x 7 = 700
    - 10^3 x 7 = 7,000

Methods we learned to multiply:

1. Place Value Sections Method pg. 111 in your workbook
2. Place Value Rows pg. 113
3. Short Cut (Space Man) pg. 114
4. New Groups Below pg. 114
5. Expanded Notation pg. 115

pick the method that you gets you correct answers, not which one is the fastest!

Multiplying a Decimal and a Whole Number:

- 10 x 0.412 = 4.12

  100 x 0.412 = 41.2

  1,000 x 0.412 = 412

  Notice the digits in the product were shifted one spot to the left for every '0' in the factor.

- Steps when the factor is **not** a power of 10:
  1. Ignore the decimals
  2. Multiply like normal
  3. Shift the digits right for every digit that is in a decimal spot in your factor

     Example: 5 x 0.12 =
     1. Think 5 x 12 = 60
     2. Shift 60 two places right because there is 2 digits in decimal spots
     3. The product is 0.60 or 0.6

Shift Patterns and Exponents

- Multiplying a number by a decimal causes digits to shift to the right
- Multiplying a number by a whole number shifts digits to the left

Estimate Products

- Use the steps we used to estimate:
  1. Underline place value spot you are rounding to
  2. Circle the number next door to the right. This number tells the underlined number what to do. Remember 0-4 keeps the number the same, 5-9 says to go up a floor

- We use estimation this unit to estimate the factors when multiplying decimals. This tells you if your product is reasonable or not. You compare your actual product to the estimated product. They should be similar.

There will only be a few basic story problems on this test!!

Note from Miss Vermeulen:

The worded notes for this unit are more difficult to understand than the last couple chapters. If you understand these notes OR understand how to do the practice problems you should be ready for the test. If the written notes are complicated, make sure you can at least do the practice problems. Mom and Dad can use the written notes as a tool when helping you study!

Practice Problems:

Multiplication. Use patterns you know to mentally multiply.

1. 67 x 100= _____
2. 10,000 x 27 = _____
3. 300 x 90 = _____

4. 200 x 40 = _____
5. 40 x 70 = _____

6. 5 x 0.01 = _____
7. 432 x 0.001= _____
8. 5 x 0.001 = _____

9. 76 x 0.1 = _____
10. 2 x 0.1 = _____

Multiply. Use any strategy that works for you.

11. 67 x 54 = _____

12. 431 x 79 = _____

13. 701 x 35 = _____

14. 45 x 281 = _____

15. 4 x 0.67 = _____

16. 3 x 0.901 = _____

17. 0.54 x 0.19 = _____

18. 1.4 x 2.7 = _____

Break apart these numbers and multiply.

19. 0.2 x 4 = _____

20. 5 x 0.32 = _____

Multiply using a shift pattern.

21. 5 x 10 x 10= _____

22. 41 x 10 x 10 x 10 = _____

23. 10^1 x 81 = _____

   10^2 x 81 = _____

   10^3 x 81 = _____

24. 10^1 x 5.4 = _____

   10^2 x 5.4 = _____

   10^3 x 5.4 = _____

25. 0.1 x 43 = _____

   0.01 x 43 = _____

   0.001 x 43 = _____

26. 0.1 x 0.114 = _____

   0.01 x 0.114 = _____

   0.001 x 0.114 = _____

Multiply.

27. 100 x 5.1 = _____

28. 1,000 x 0.124= _____

29. 0.01 x 4.2 = _____

30. 0.001 x 0.54 = _____