Lesson 2

Multiplying and Dividing whole numbers and $

Problem Solving

- Sam thought of a number **between ten and twenty**. Then he gave a clue: You say the number when you count **by twos** and when you count **by threes**, but **not when you count by fours**.
- Of what number was Sam thinking?

Multiplication

- Factor * Factor = Product
- 2 * 2 = 4
- or 2(2) = 4
- or a * b, ab, a(b)

All of these are the same.

Partial product

When we multiply by a two-digit number on paper, we multiply twice. To multiply 28 by 14, we first multiply 28 by 4. Then we multiply 28 by 10. For each multiplication we write a partial product. We add the partial products to find the final product.

28	factor
× 14	factor
112	partial product (28 × 4)
280	partial product (28 × 10)
392	product (14 × 28)

Commutative Property

- **Addition:** Numbers can be added in any order
- $2 + 9 = 9 + 2$
- **Multiplication:** Numbers can be multipied in any order
- $2 \times 9 = 9 \times 2$

Identity Property

- **Addition:** $9+0=9$
- 0 is the **additive identity**
- **Multiplication:** $9\times 1=9$
- 1 is the **multiplicative identity**

Zero Property of Multiplication

- $5 \times 0 = 0$
- $a \times 0 = 0$

Associative Property

- Numbers can be grouped any way and the answer will be the same.
- $(2+3)+4=2+(3+4)$
- $(a+b)+c=a+(b+c)$
- $(2\times3)\times4=2\times(3\times4)$
- $(a\times b)\times c=a\times(b\times c)$

Review

Properties of Operations
Commutative Properties $a + b = b + a$ $a \times b = b \times a$
Associative Properties $(a + b) + c = a + (b + c)$ $(a \times b) \times c = a \times (b \times c)$
Identity Properties $a + 0 = a$ $a \times 1 = a$
Property of Zero for Multiplication $a \times 0 = 0$

Homework

- Practice Set and Written Practice
- Due Friday