Introduction to Construction Math

A Review of Arithmetic

- In one of your math classes, have you ever said to yourself, “when am I ever going to need to know this?”

- The answer is: Every day on the job!

Basic Math Review

Whole Numbers

Whole Numbers

- **Whole numbers** are zero and all counting numbers (1, 2, 3…), but no fractions, decimals, or negative numbers.

- **Integers** are formed by the natural numbers including 0 (0, 1, 2, 3, ...) together with the negatives of the non-zero natural numbers (−1, −2, −3, ...).

Whole Numbers

- They can easily be
  - Added together or combined
    - to get a sum
  - Subtracted
    - to get the difference
  - Multiplied
    - to get a product
  - Divided
    - To get the quotient

Addition and Subtraction

- The total or **sum** is the answer to an addition problem.
- The **difference** is the answer to a subtraction problem.

Place Value

- The **place value** of each digit in a base ten number is determined by its position with respect to the decimal point.

hundred thousands	**ten thousands**	**thousands**	comma	**hundreds**	**tens**	**ones or units**	decimal point	**tenths**	**hundreths**	**thousanths**	**ten thousanths**	**hundred thousanths**
	2	3	,	4	5	6	•	0				

Addition and Subtraction

- Make sure that place values are **aligned** properly when adding or subtracting.
- Some numbers have an assumed (invisible) decimal place:

hundred thousands	**ten thousands**	**thousands**	comma	**hundreds**	**tens**	**ones or units**	decimal point	**tenths**	**hundreths**	**thousanths**	**ten thousanths**	**hundred thousanths**
	2	3	,	4	5	6						
					2	3	•	5	4			
	+						•	6	2	5		

Multiplication

- A **product** is the answer to a multiplication problem.
- The numbers being multiplied are each called a **factor**.
- It is not necessary to align place values when multiplying.
- The **product** will have decimal places **equal to the total number** of decimal places in the factors.

Division

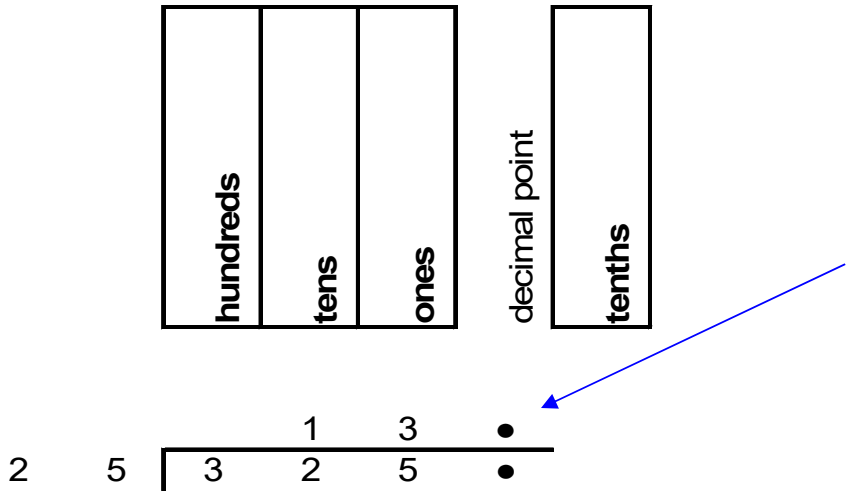
- A **quotient** is the answer to a division problem.
- The number being divided is called the **dividend**.
- The number that you are *dividing by* is called the **divisor**.
- If there is a number remaining after the division process has been completed, it is called a **remainder**.

Division

- Decimal Places
  - If the devisor has no decimal places
    - The decimal in the quotient goes directly above the decimal in the dividend.
  - If the devisor has decimal places
    - Move the decimal place in the quotient to the left a number of places equal to the decimal places in the devisor.

Division

- Always align the decimal point of the quotient with that of the dividend.



Division

- If the *divisor* has decimal places, the decimal place in the dividend must be moved an equal number of places to the left.