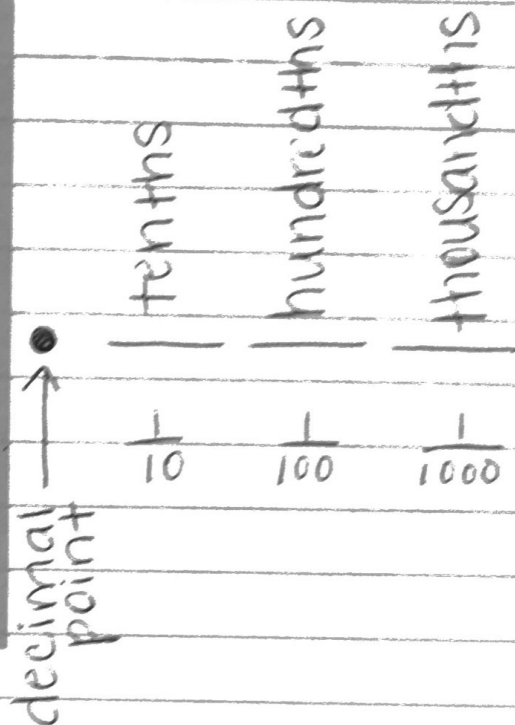


Place Value

Place Value								
Hundred Millions	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
							7	4
						3	7	4
					6	3	7	4
				8	6	3	7	4
			5	8	6	3	7	4
			5	8	6	3	7	4
		9	5	8	6	3	7	4
	1	9	5	8	6	3	7	4
4	1	9	5	8	6	3	7	4



Ways to write numbers:

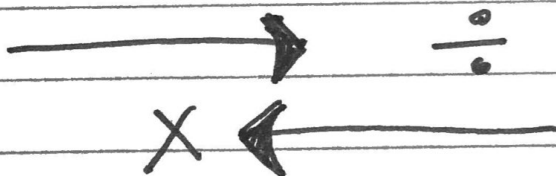
- Standard Form: 4,560.62
- Word Form: four thousand five hundred sixty and sixty-two hundredths.
- Expanded Form: $(4 \times 1000) + (5 \times 100) + (6 \times 10) + (6 \times \frac{1}{10}) + (2 \times \frac{1}{100})$

Powers of 10

SANDS		UNITS			DECIMALS			
Ten thousands $\times 10$	Thousands $\times 10$	Hundreds $\times 10$	Tens $\times 10$	Ones $\times 10$	Decimal	Tenths $\times 10$	Hundredths $\times 10$	Thousandths
10,000	1,000	100	10	1	.	.1	.01	.001
10^4	10^3	10^2	10^1	10^0	DECIMAL POINT	10^{-1}	10^{-2}	10^{-3}

Each place value is 10 times as great as the place value to the right.

Each place value is $\frac{1}{10}$ the value of the place value to the left.



move decimal/add zeros

Exponents

- Repeated multiplication

$$10^3 \leftarrow \text{exponent}$$

↑
Base

The exponent tells you how many times the base is multiplied by itself.

$$10^1 = 10$$

$$10^2 = 100$$

$$10^3 = 1,000$$

$$10^4 = 10,000$$

$$10^5 = 100,000$$

The exponent tells you how many zeros are in your answer when 10 is the base.

Multiplying Decimals by powers of 10

5.NBT.2

I can explain patterns when multiplying a number by powers of 10. I can explain patterns when a decimal is multiplied or divided by a power of 10.

$$6.43 \times 10^3 =$$

6,430

$$0.761 \times 10 =$$

7.61

$$49.2 \times 10^2 =$$

4,920

Multiplying by Powers of Ten:
move the decimal point the right
the same number of zeros in the
power of ten. This is also the
same number as the exponent on
10.

Example: $16.70 \times 100 = 1,670$

$$2.61 \times 10^1 =$$

26.1

$$34 \times 100 =$$

1,234

$$6.071 \times 1000 =$$

6,071

$$5.10 \times 10^3 =$$

5,100

$$12.19 \times 10^2 =$$

1,219

Rounding

Step 1: Underline the place you are rounding.

Step 2: LOOK at the neighbor to the right. Circle it

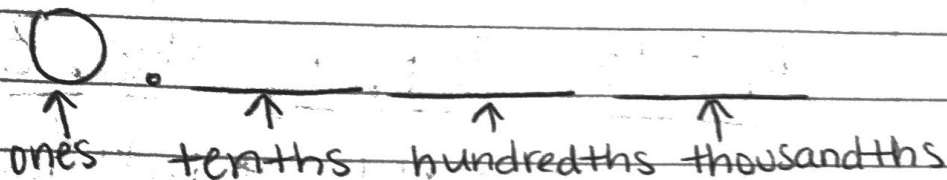
Step 3: LOOK at the number in the circle, use rounding rules:

- ★ 4 or less, let it rest (stay)
- ★ 5 or more, let it soar (add 1)

Step 4: Anything to the left of the underlined place value stays the same. Anything to the right becomes zeros.

Comparing Decimals

Which is bigger?



1. Write the numbers vertically (one on top of the other) line up the place values.

2. Compare from left to right (largest to smallest value).

Example:
$$\begin{array}{r} 43.00 \\ 43.6 \end{array}$$

↑
Six is greater than zero

$43.00 < 43.6$

Ordering Decimals

Example: Order from least to greatest:

43.6, 34.4, 46.3, 43.3

43.6 ← Next lowest in tens/ones

~~34.4~~ ← lowest number in tens place

46.3

43.3 ← lowest in tens/ones/tenths

answer: 34.4, 43.3, 43.6, 46.3

Adding and Subtracting Decimals

Step 1: Line up each
place value.

Step 2: Fill the empty
spaces with zeros.

Step 3: Drop the decimal
point down! ↓

Step 4: Add/Subtract
starting from right
to left.

Example: $7.12 + 4.259 =$

$$\begin{array}{r} 7.120 \\ + 4.259 \\ \hline 11.379 \end{array}$$

Estimating

ABOUT

APPROXIMATE

ROUND

CLOSE TO

ALMOST

★ Find a close answer! ★

Round each number, (to the nearest one)
then add/subtract them to get your answer.

Example:

$$466 + 119 =$$

↓ ↓

$$470 + 120 = 590$$

$$27.5 - 16.09 =$$

↓ ↓

$$28 - 16 = 12$$

$$545.5 + 2.78 =$$

↓ ↓

$$546 + 3 = 549$$

Adding and Subtracting With a place value chart

Ex 1: 9 ones 5 tenths - 3 tenths

tens	ones	tenths	hundredths
	•••••	•••	
	•••••	•••	
	↓	↓	
	9	2	

Ex 2: 9 ones 5 tenths - 6 tenths
(9.5) - (0.6)

tens	ones	tenths	hundredths
	•••••	•••••	
	•••••	•••••	
	↓	↓	
	8	9	

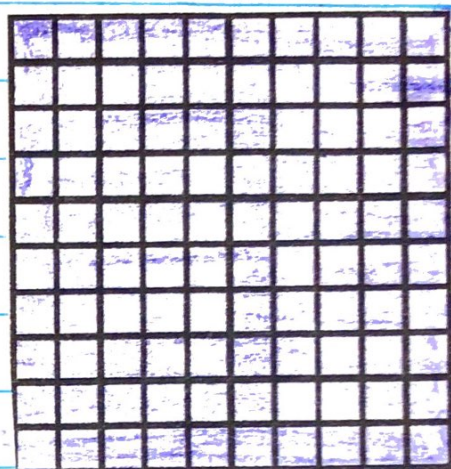
Ex 3: 6 tens + 1 one 3 tenths

tens	ones	tenths	hundredths
•••••	•	•••	
•			
	↓	↓	
6	1	3	

Adding and Subtracting Decimals with Base 10 models

Decimal Models can be
10, 100, or 1,000 units
(squares).

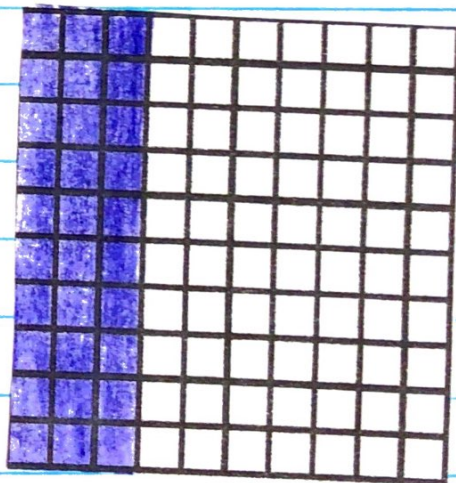
If a model is completely
shaded, it
equals 1 whole
or 1.00



1.00

The amount
shaded is out
of 100.

$$\frac{30}{100} = 0.3 =$$



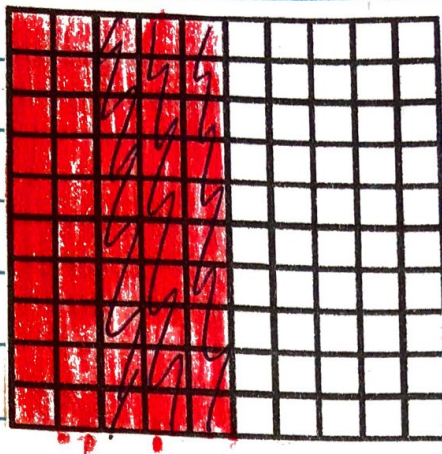
Subtracting

1. Shade the larger number
2. Subtract the 2nd number by crossing out that amount.
3. Count the remaining squares.

$$= 8.0$$

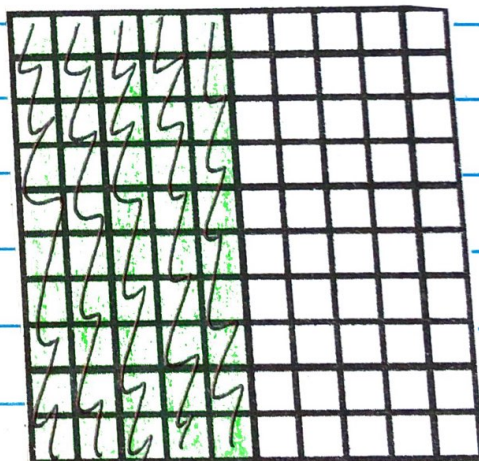
Example 1:

$$0.5 - 0.3 = 0.2$$



Example 2:

$$1.5 - 0.7 = 0.8$$

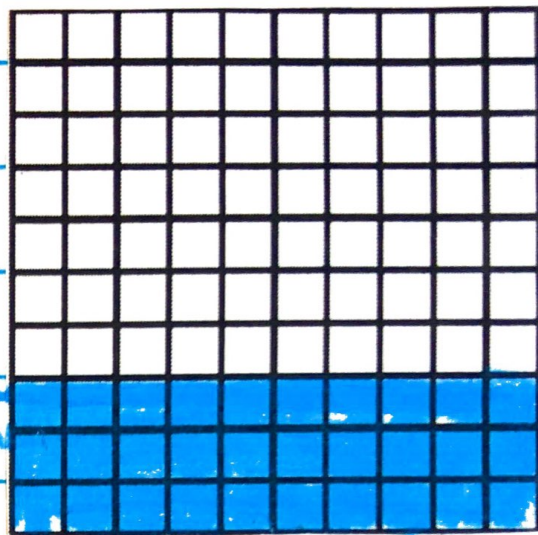
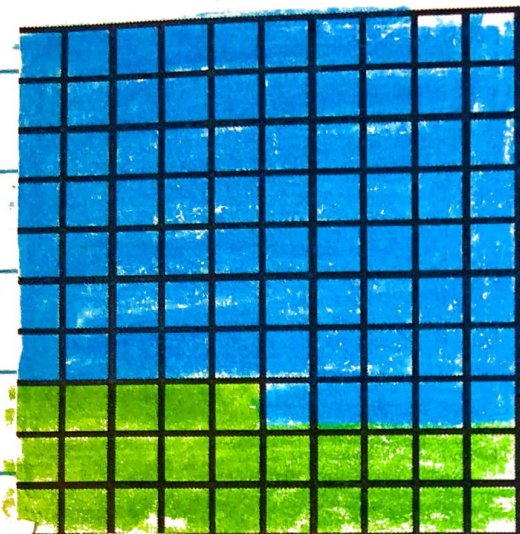


Adding

1. Shade in the first number in color.
2. Shade the second number in a different color.
3. Count up all the squares!

③ Count up all the shaded units.

Example: $0.25 + 1.05$



$$= 1.30$$