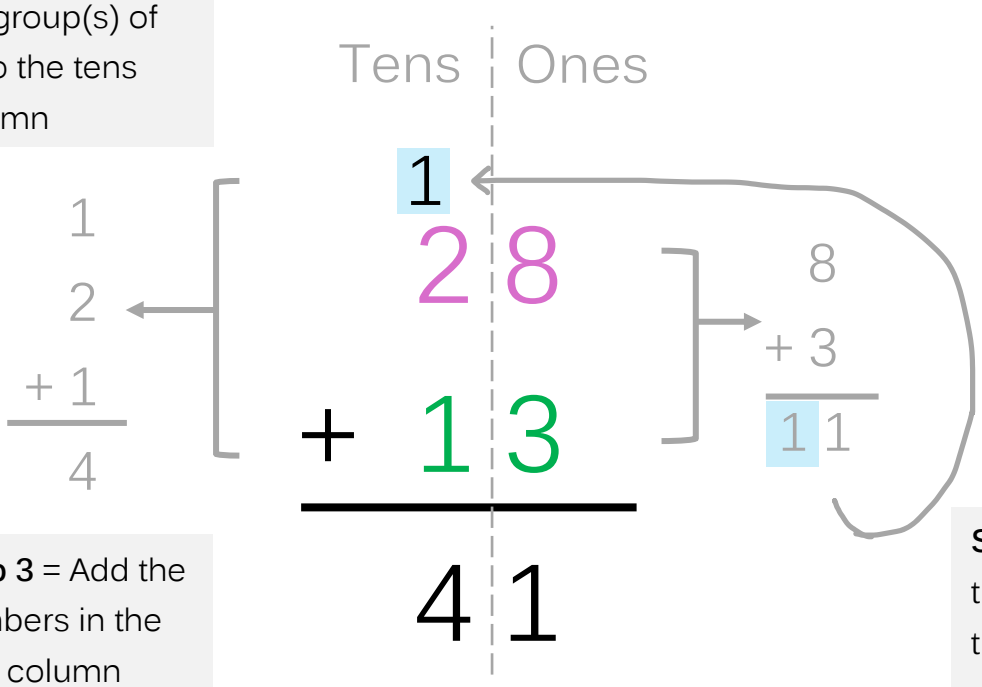
Addition with Regrouping

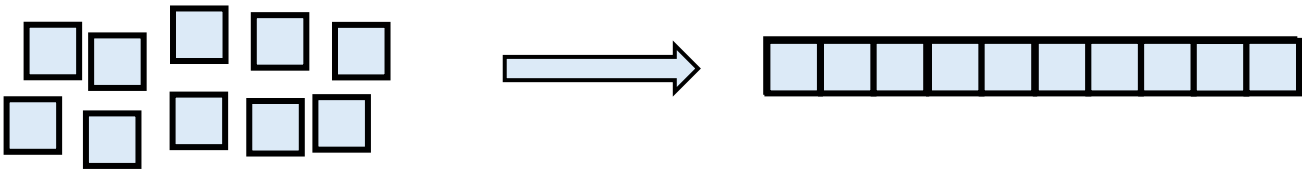
Step 2 = Carry the group(s) of 10 to the tens column

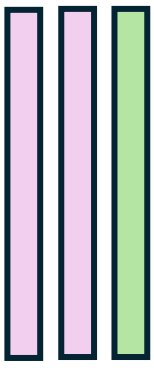
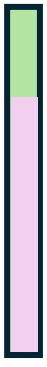
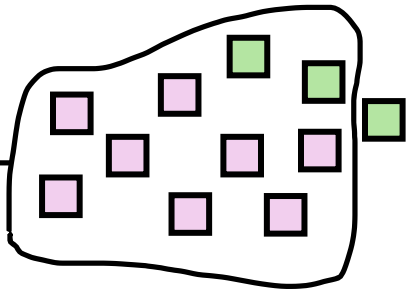


Step 3 = Add the numbers in the tens column

Step 1 = Add the numbers in the ones column

Regrouping is when 10 ones are traded for 1 ten



Tens	Ones
 	

Subtraction with Regrouping

Step 3 = Subtract the numbers in the tens column and write the answer in the tens column to get your final answer.

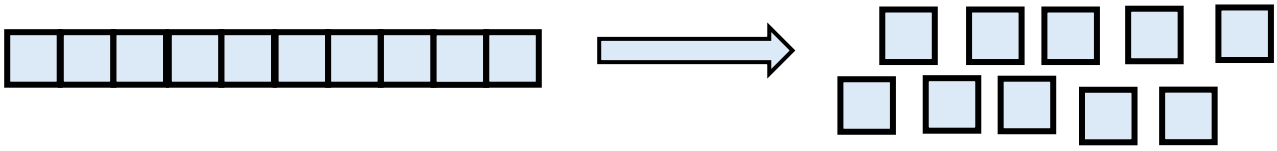
Tens	Ones
~~3~~ 4	17
- 2	9
4	1

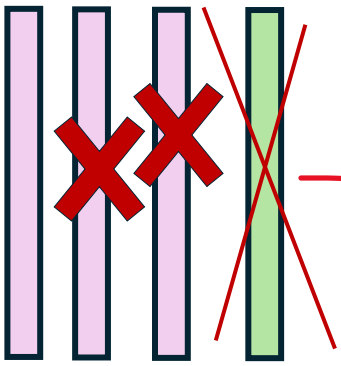
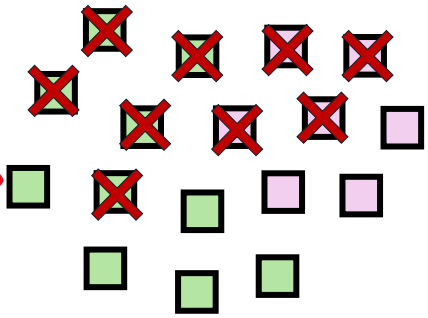
Step 2 = Subtract the numbers in the ones column and write the answer in the ones column.

Step 1 = When the number of ones in the bottom number is more than the ones in the top number you must regroup (trade)

Regrouping :

When 1 ten is traded for 10 ones



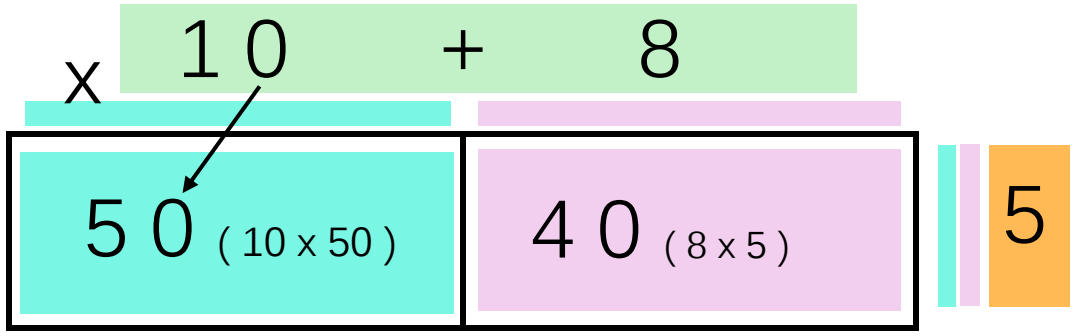
Tens	Ones
	

Multiplication Area / Box Method

Tens	Ones
1	8
x	5
9	0

Step 1 = Draw a long rectangle and cut it in half

Step 2 = Write the top number in expanded form along the top of the boxes



Step 5 = multiply the numbers in the 2nd column and write your answer in the blank box

Step 4 = multiply the numbers in the 1st column and write your answer in the blank box

Step 3 = Put the bottom number you are multiplying by along the side of the box

Step 6 = Add the numbers inside the boxes together to get your final answer

	50
+	40
	90

Trick !
You can ignore the zero when you multiply numbers and then bring the zeros back at end if needed

Multiplication Area / Box Method

Hundreds	Tens	Ones
	2	6
x	1	2
3	1	2

Step 1 = Draw a box and divide it into 4 parts

Step 2 = Write the top number in expanded form along the top of the boxes, and bottom number along the side of the boxes

20 + 6

4 — 200 (20 x 10)	1 — 60 (6 x 10)
3 — 40 (20 x 2)	2 — 12 (6 x 2)

10 + 2

Step 3 = To get the answer for box 1 multiply the numbers that touch the edges
6 x 10 = 60

Step 4 = To get the answer for box 2 multiply the numbers at the top of the column and along its side
6 x 2 = 12

Step 5 = To get the answer for box 3 multiply the numbers at the top of the column and along its side
20 x 2 = 40

Step 6 = To get the answer for box 4 multiply the numbers that touch the edges
20 x 10 = 200

$$\begin{array}{r} {\scriptstyle 1}\,200 \\ 60 \\ 40 \\ +\ 12 \\ \hline 312 \end{array}$$

Step 7 = Add the numbers inside the boxes together to get your final answer

Trick !
You can ignore the zero when you multiply numbers and then bring the zeros back at end if needed

Multiplication Expanded Method

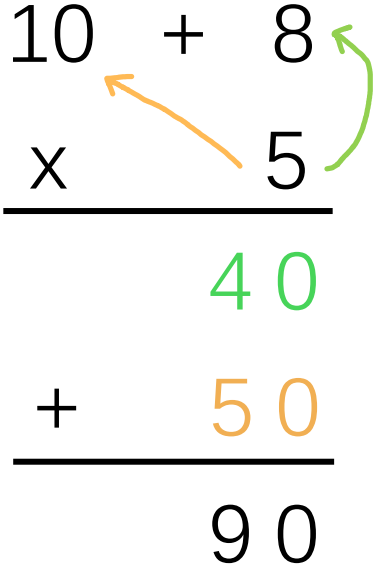
Tens	Ones
1	8
x	5
9	0

Step 1 = Put all numbers into expanded form

Step 2 = Multiply the bottom number by the ones place of the top number And write the answer below

Step 3 = Multiply the bottom number by the tens place of the top number and write the answer below

Step 4 = Add the two answers together to get the final answer



Multiplication Expanded Method

Hundreds	Tens	Ones
	2	6
x	1	2
3	1	2

Step 1 = Put all numbers into expanded form

$20 + 6$

$\times\ 10 + 2$

Step 2 = start by multiplying both numbers in the ones column and write the answer below.
6 x 2 = 12

12

Step 3 = Then multiply the bottom number of the ones place by the tens place of the top number and write the answer below.
2 x 20 = 40

40

Step 4 = Then multiply the bottom number of the tens place by the ones place of the top number and write the answer below.
10 x 6 = 60

60

Step 5 = Then multiply numbers of the tens column and write the answer below.
10 x 20 = 200

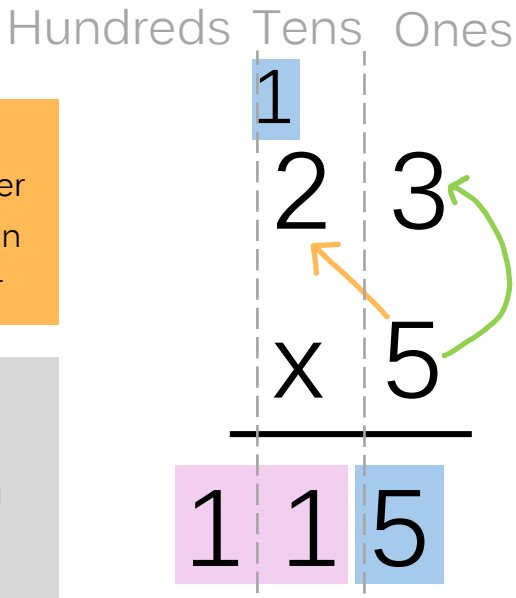
$+\ ^{1}200$

Step 6 = Add the 4 answers together to get the final answer.

312

Trick !
You can ignore the zero when you multiply numbers and then bring the zeros back at end if needed

Multiplication Traditional Method



Step 1 = Multiply the bottom number by the ones column of the top number.

3 x 5 = 15

Step 2 = If the answer is 10 or greater you must regroup and carry the group(s) of 10. And write the ones in the ones column under the equation.

5 x 3 = 15 , must carry the 1 group of 10

Step 3 = Multiply the bottom number by the tens column of the top number

Step 4 = If you carried anything add it to what you got for step 3.

5 x 2 = 10 + 1 = 11

What was carried

Step 5 = Write the answer from step 3 below the equation to get your final answer.

Multiplication Traditional Method

Step 1 = Multiply the numbers in the ones column.

2 x 6 = 12

Step 2 = If the answer is 10 or greater you must regroup and carry the group(s) of 10. And write the ones in the ones column under the equation.

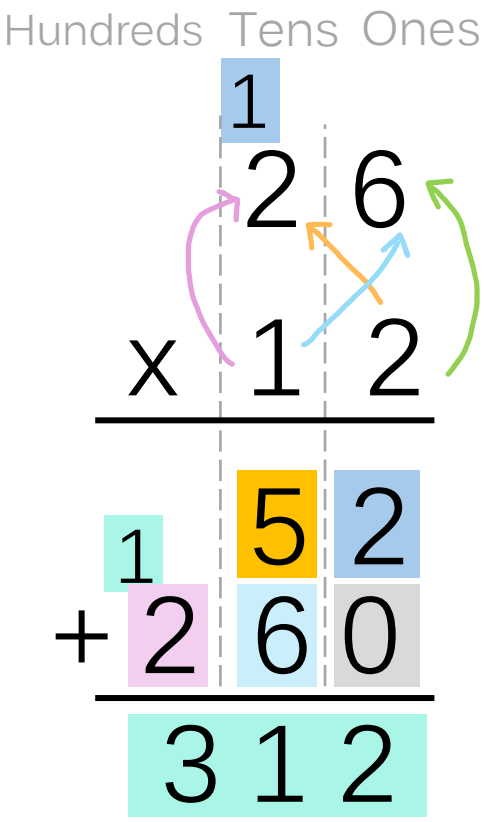
2 x 6 = 12 , so must carry the group of 10

Step 3 = Then multiply the bottom number of the ones place by the tens place of the top number and write the answer below.

2 x 2 = 4 + 1 = 5

↗ What was carried

Step 4 = bring down your zero. Write a zero on the next line in the ones column. This is your place holder as you multiply out the bottom tens place.



Step 5 = Then multiply the bottom number of the tens place by the ones place of the top number and write the answer below.

1 x 6 = 6

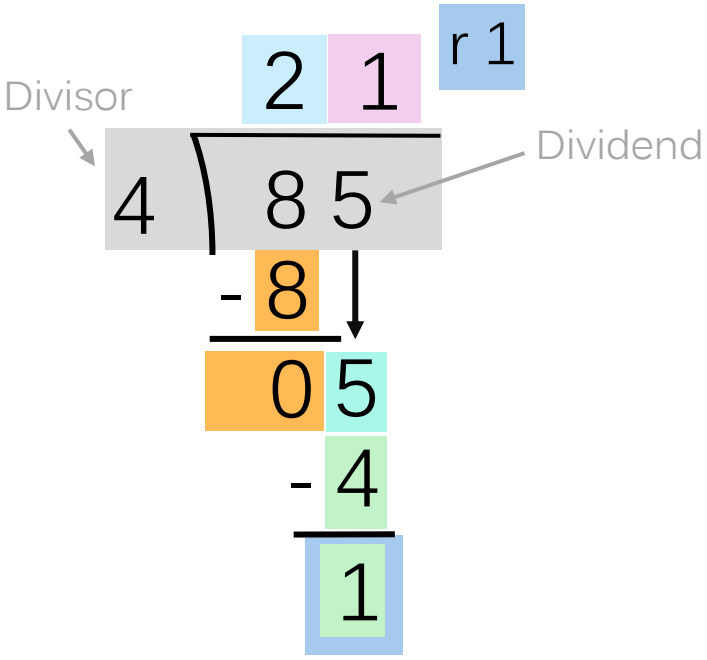
Step 6 = Then multiply numbers in the tens column and write the answer below.

1 x 2 = 2

Step 6 = Add the 2 rows together to get the final answer.

Division with Long Division

$$85 \div 4 =$$



Reminder :
- Divide
- Multiply
- Subtract
- Bring down

Repeat from the top

Step 1 = Set up the equation

Step 2 = Then find out how many times the divisor (4) can go into the 1st digit of the dividend (8). Then write that number above the division equation

Step 3 = Then multiply the answer from step 2 by the divisor (2) and subtract it from the 1st digit of dividend (8)

Step 4 = Then bring the next digit of the divisor down.

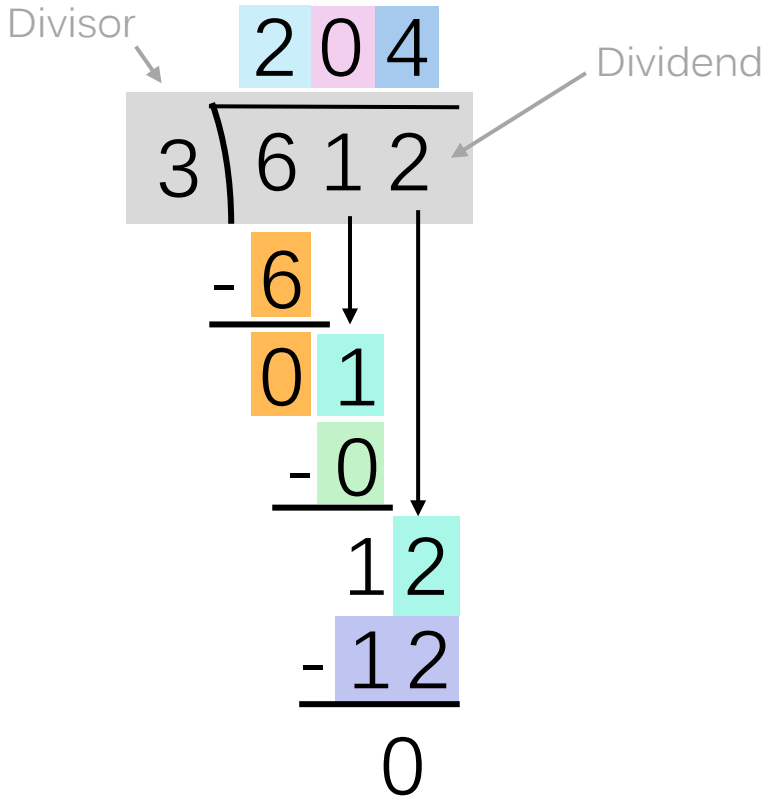
Step 5 = Then find out how many times the divisor (4) can go into the answer from the answer of step 4 (5) And write it above the equation

Step 6 = Then multiply the answer from step 5 (1) by the divisor (4) and subtract it.

Step 7 = As there are no more digits to bring down from the dividend you are done and any digit left over from step 6 is your remainder. Write it with a small r in front of it with your answer at the top of the equation.

Division with Long Division

$612 \div 3 =$



Reminder :
- Divide
- Multiply
- Subtract
- Bring down

Repeat from the top

Step 1 = Set up the equation

Step 2 = Then find out how many times the divisor (3) can go into the 1st digit of the dividend (6). Then write that number above the division equation

Step 3 = Then multiply the answer from step 2 by the divisor (3) and subtract it from the 1st digit of dividend (6)

Step 4 = Then bring the next digit of the divisor down.

Step 5 = Then find out how many times the divisor (4) can go into the answer from the answer of step 4 (5) And write it above the equation

Step 6 = Then multiply the answer from step 5 (1) by the divisor (4) and subtract it.

Step 7 = Then bring the next digit of the divisor down.

Step 8 = Then find out how many times the divisor (4) can go into the answer from the answer of step 7 (12) And write it above the equation

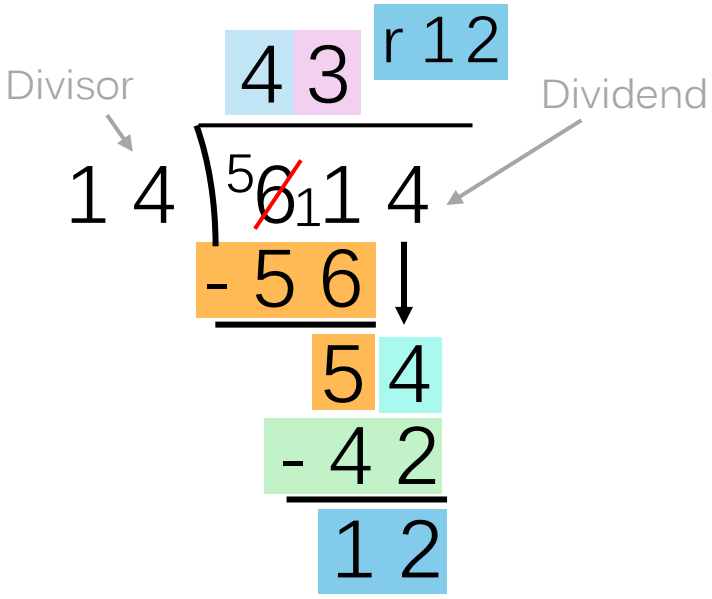
Step 9 = Then multiply the answer from step 8 (4) by the divisor (3) and subtract it.

Step 8 = As there are no more digits to bring down from the dividend you are done and any digit left over from step 6 is your remainder. Write it with a small r in front of it with your answer at the top of the equation.

No remainder for this example .

Division with Long Division

$614 \div 14 =$



Reminder :
- Divide
- Multiply
- Subtract
- Bring down

Repeat from the top

Step 1 = Set up the equation

Step 2 = Then find out how many times the divisor (14) can go into the 1st two digits of the dividend (61). Then write that number above the division equation

Step 3 = Then multiply the answer from step 2 (4) by the divisor (14) and subtract it from the 1st two digits of dividend (61)

Step 4 = Then bring the next digit of the divisor down.

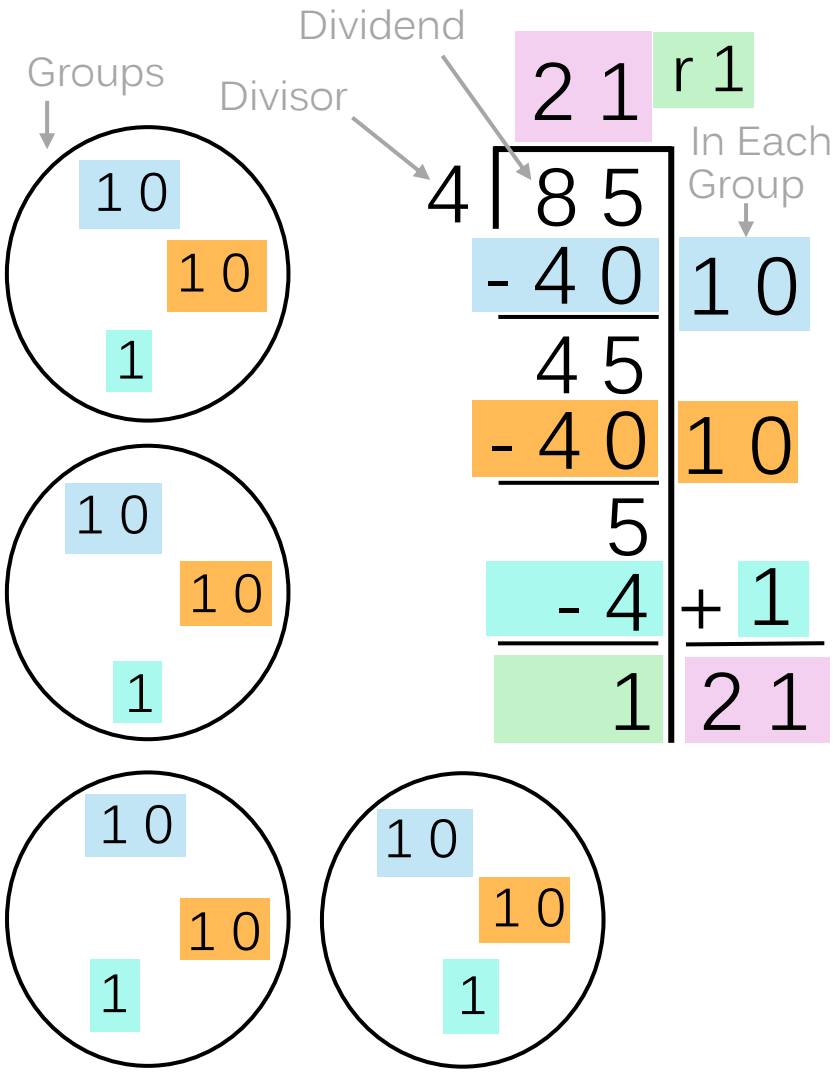
Step 5 = Then find out how many times the divisor (14) can go into the answer from the answer of step 4 (54) and write it above the equation

Step 6 = Then multiply the answer from step 5 (3) by the divisor (14) and subtract it.

Step 7 = As there are no more digits to bring down from the dividend you are done and any digit left over from step 6 is your remainder. Write it with a small r in front of it with your answer at the top of the equation.

Division with Partial Quotient Method

$$85 \div 4 =$$



Step 1 = Set up the equation and the number of groups as circles (4)

Step 2 = Then using the dividend (85) find out how many to put in each group evenly and subtract the total amount in the groups from the dividend. Keep track of what was put in each group down the right side of your equation.

Step 3 = With what is left of the divisor put an amount into each group equally and subtract the total amount again.

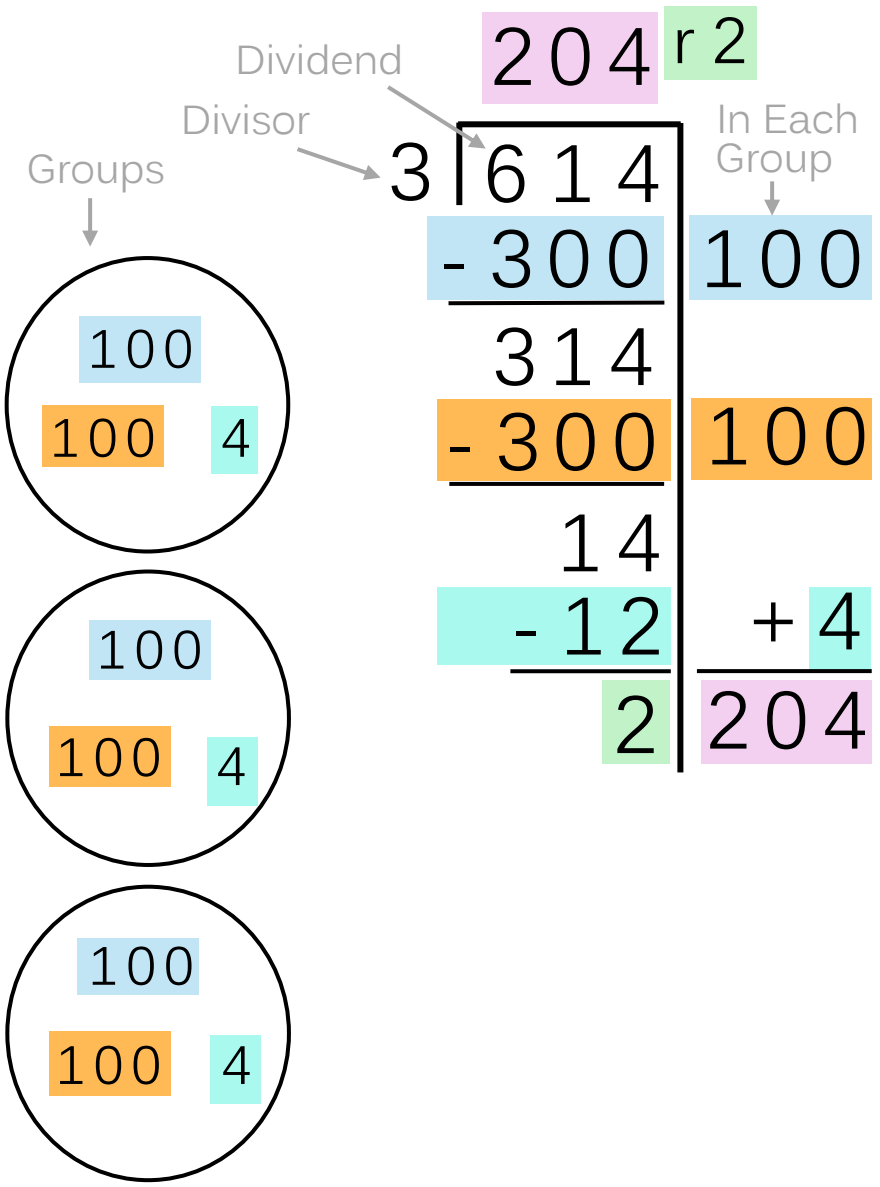
Step 4 = With what is left of the divisor put an amount into each group equally and subtract the total amount again.

Step 5 = Once you cannot put the answer from the past step into the groups evenly you are done. Add up the amount in on the right side of your equation (what is in each group)

Step 6 = the amount left of the divisor is the remainder. Write it with a small r in front of it with your answer

Division with Partial Quotient Method

$$614 \div 3 =$$



Step 1 = Set up the equation and the number of groups as circles (4)

Step 2 = Then using the dividend (614) find out how many to put in each group evenly and subtract the total amount in the groups from the dividend. Keep track of what was put in each group down the right side of your equation.

Step 3 = With what is left of the divisor put an amount into each group equally and subtract the total amount again.

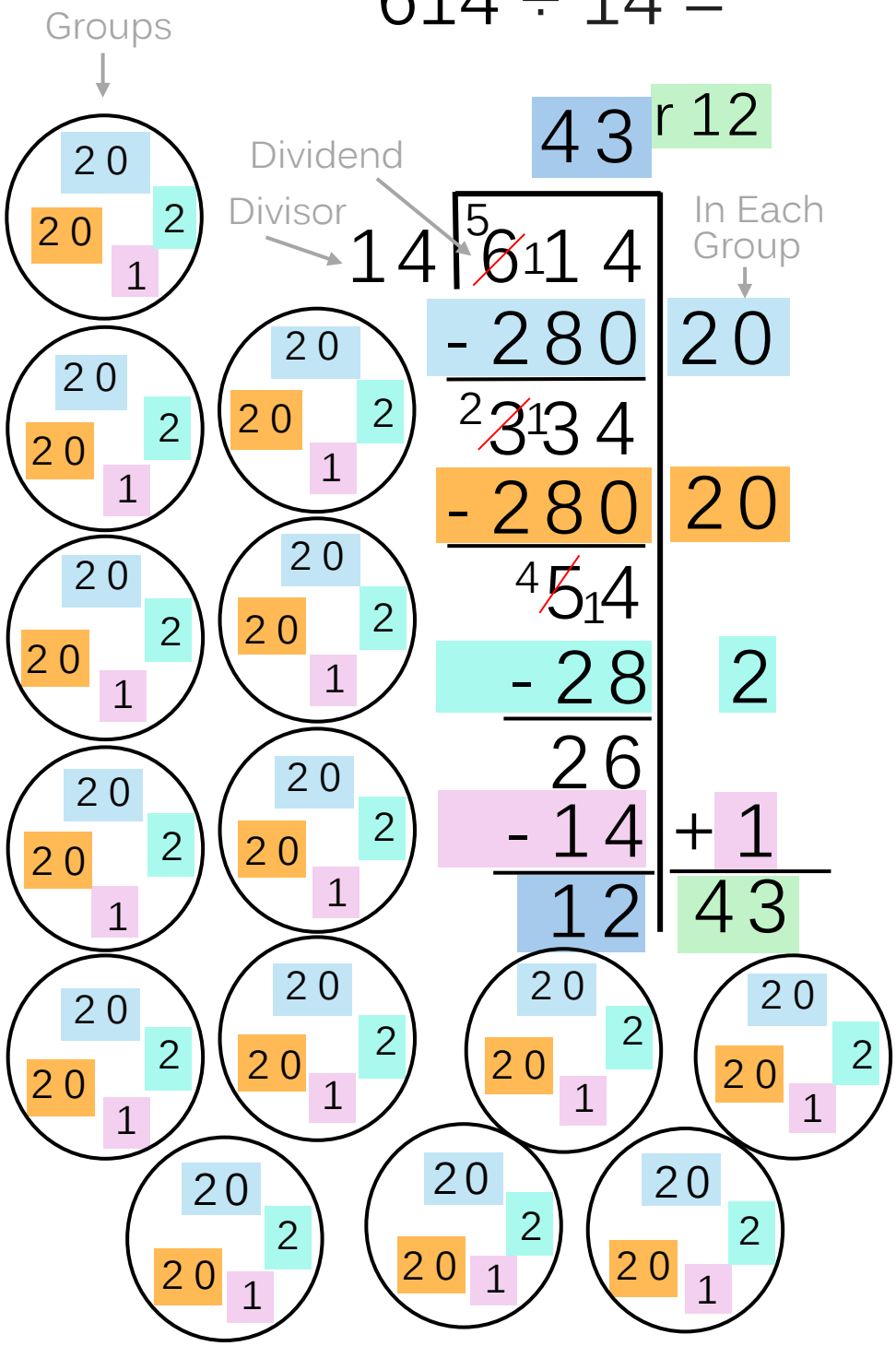
Step 4 = With what is left of the divisor put an amount into each group equally and subtract the total amount again.

Step 5 = Once you cannot put the answer from the past step into the groups evenly you are done. Add up the amount in on the right side of your equation (what is in each group) and write that total above your equation.

Step 6 = the amount left of the divisor is the remainder. Write it with a small r in front of it with your answer at the top of the equation.

Division with Partial Quotient Method

$$614 \div 14 =$$



Step 1 = Set up the equation and the number of groups as circles (4)

Step 2 = Then using the dividend (614) find out how many to put in each group evenly and subtract the total amount in the groups from the dividend. Keep track of what was put in each group down the right side of your equation.

Step 3 = With what is left of the divisor put an amount into each group equally and subtract the total amount again.

Step 4 = With what is left of the divisor put an amount into each group equally and subtract the total amount again.

Step 5 = With what is left of the divisor put an amount into each group equally and subtract the total amount again.

Step 7 = the amount left of the divisor is the remainder. Write it with a small r in front of it with your answer at the top of the equation.

Step 6 = Once you cannot put the answer from the past step into the groups evenly you are done. Add up the amount in on the right side of your equation (what is in each group) and write that total above your equation.

Decimal Numbers

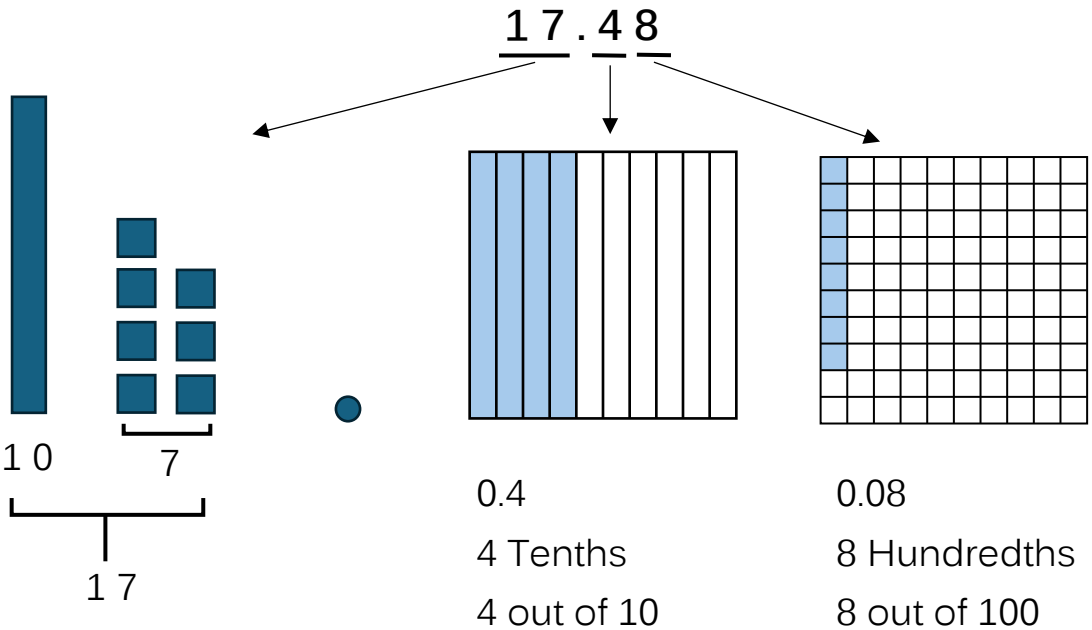
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	.	tenths	hundredths	thousandths	ten thousandths	hundred thousandths
HTH	TTh	Th	H	T	O	.	t	h	th	tth	hth
100,000	10,000	1,000	100	10	1	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1,000}$	$\frac{1}{10,000}$	$\frac{1}{100,000}$

Whole Number Part

Fractional Part

Decimal Point

Visually we can show decimals with decimal squares.



Decimals in Expanded Form

Expanded form is when we pull a number apart to show the value of each digit. This can be done to show the value of each decimal number the same was as with whole numbers.

Example : 12.25 → 10 + 2 + 0.2 + 0.05

Tens Ones Tenths Hundredths

Condensed Form	Expanded Form
42.52	= 40 + 2 + 0.5 + 0.02
527.81	= 500+ 20 + 7 + 0.8 + 0.01
4.27	= 4 + 0.2 + 0.07
23.61	= 20 + 3 + 0.6 + 0.01

Give the value and place of the underlined digits :

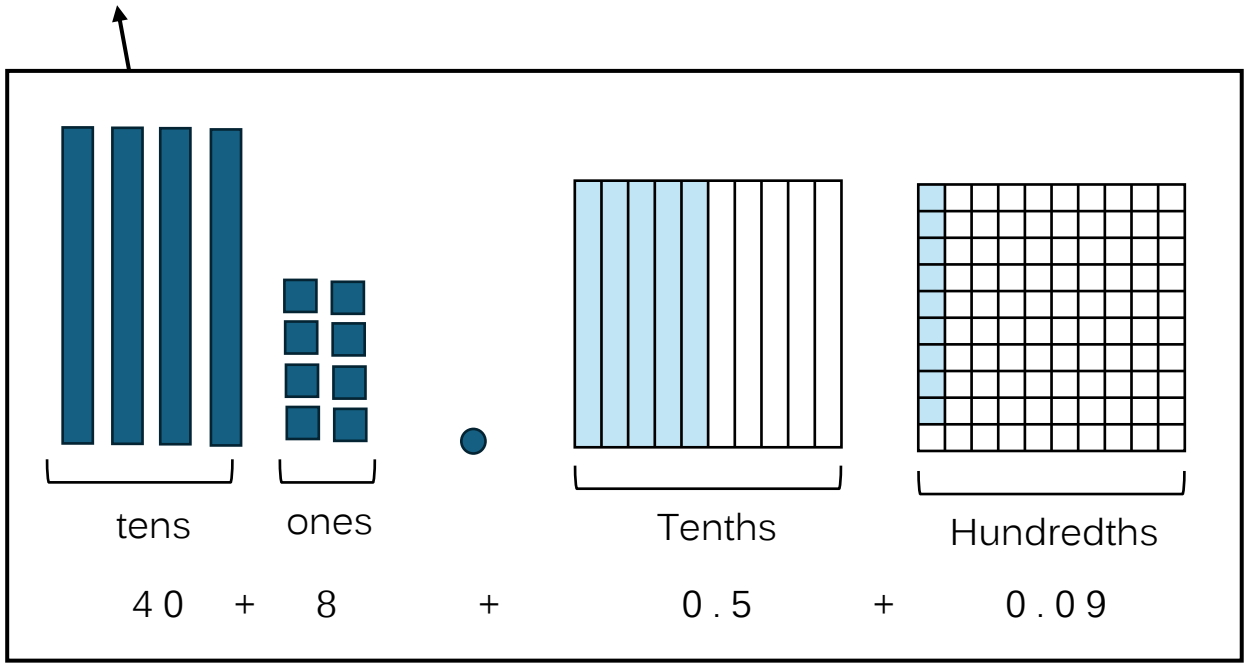
1<u>2</u>.25 = 2 , ones place

74.<u>6</u>3 = 0.6 , six tenths , tenths place

<u>8</u>6.12 = 80 , tens place

<u>4</u>35.2<u>8</u> = 400 , hundreds place

48.5<u>9</u> = 0.09 , nine hundredths , hundredths place



Rounding Decimals

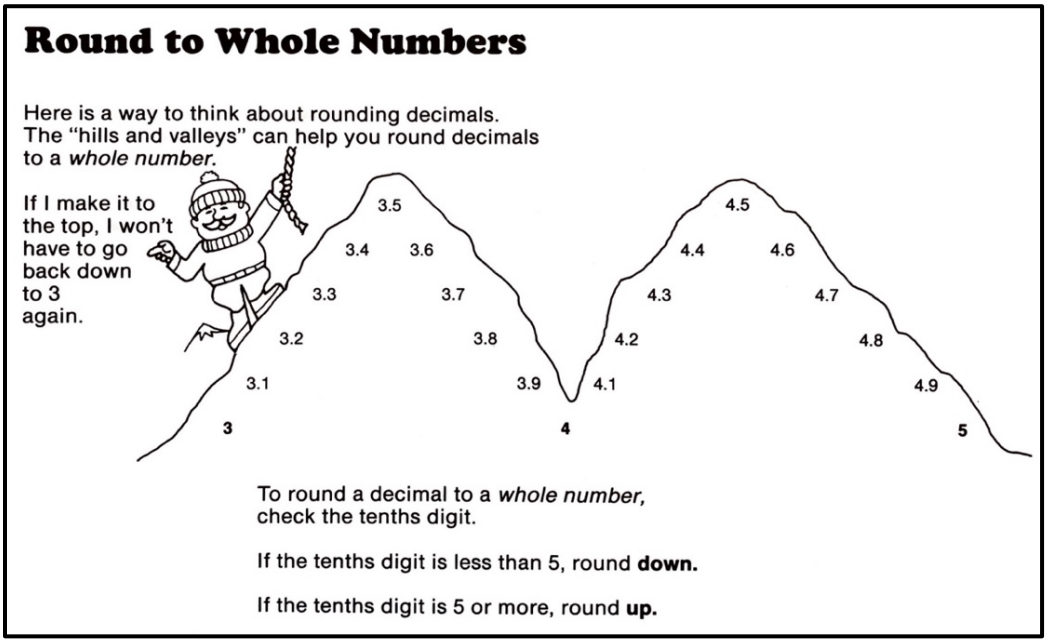
The rules for rounding whole numbers apply to rounding decimal numbers.

1. Determine the place value to which the number will be rounded
2. Look at the number to the right of that value
3. **If that number is equal to 4 or lower, keep the desired place value as it is. If it is equal to 5 or higher, round it up.**
4. Change all of the values to the right of the desired digit to zero.

Examples :

Round the underlined digit :

5 7 8 → 5 8 0 , 7, 2 3 5 → 7, 2 0 0



Round to the nearest whole number :

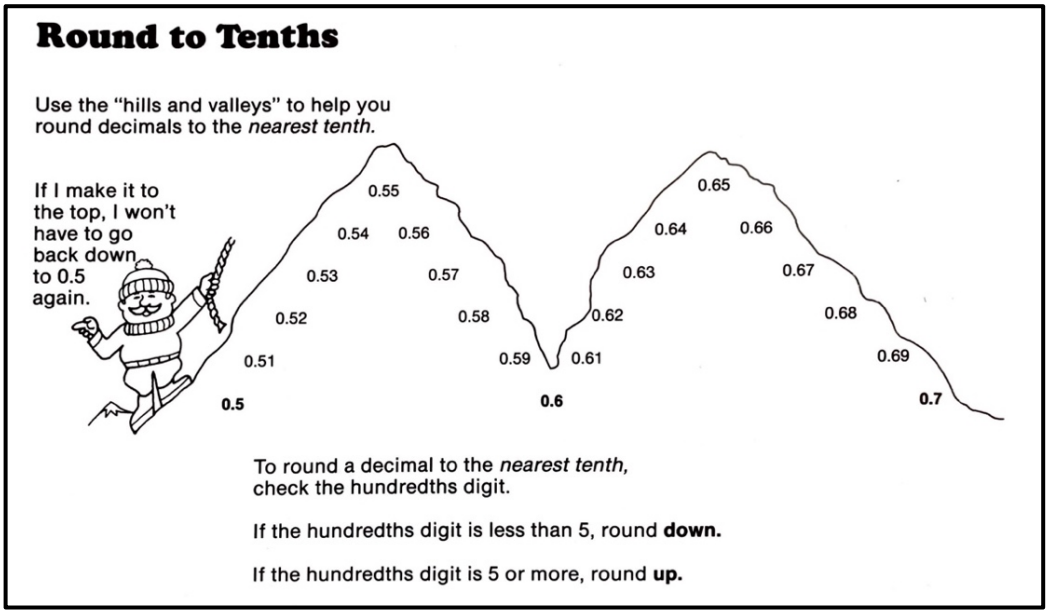
1) 4 . 2 → 4

2) 6 . 5 → 7

3) 8 . 8 → 9

4) 2 . 4 → 2

5) 9 . 3 → 9



Round to the nearest tenth :

1) 0 . 6 7 → 0 . 7

2) 0 . 2 3 → 0 . 2

3) 0 . 9 7 → 1

4) 4 . 7 2 → 4 . 7

5) 2 . 8 8 → 2 . 9

Ordering Decimal Number

The rules for ordering whole numbers apply to ordering decimal numbers. You need to identify which number is bigger / smaller based on the values of each digit .

Examples :

Ascending (smallest to biggest , counting forwards)
0.02 , 0.45 , 0.76 , 1.85 , 3.94 , 8

Descending (biggest to smallest , backwards)
8 , 3.94 , 1.85 , 0.76 , 0.45 , 0.02

Put the following list of numbers in ascending order :

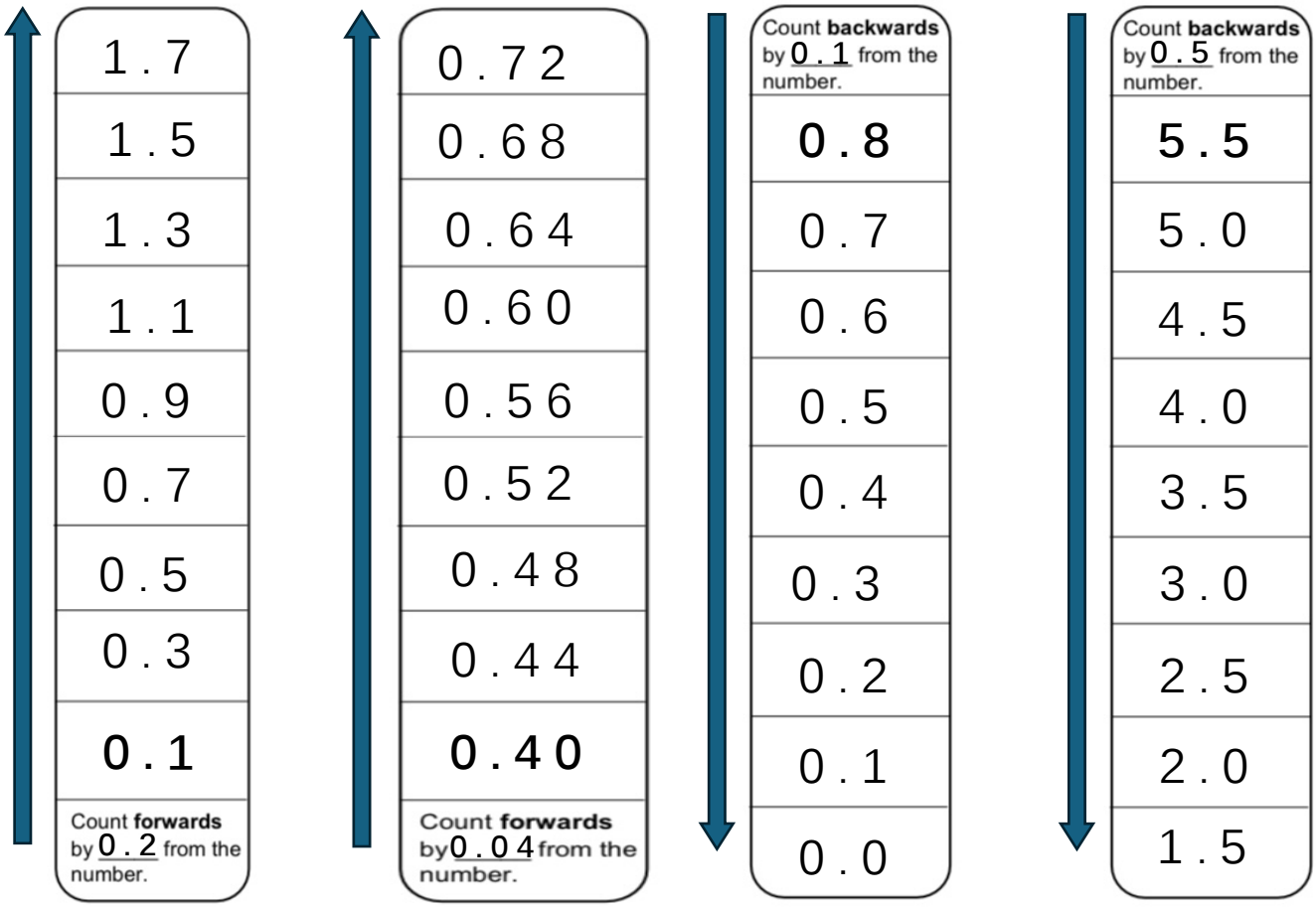
0.5 , 3.75 , 0.07 , 7.6 , 0.8 = 0.07 , 0.5 , 0.8 , 3.75 , 7.6

Skip Counting with decimal numbers

The same way you skip count with whole numbers, you can skip count with decimal numbers. You must be careful with where the decimal point is when skip counting decimal numbers

Example : 0.2 , 0.4 , 0.6 , 0.8 , 1.0 , 1.2 , 1.4 , 1.6 , 1.8 , 2.0 , 2.2 . . .

Below is how it will appear on your SNAP



Adding & Subtracting Decimals

Adding and subtracting decimal numbers is similar to when working with whole numbers.

Step 1 : Set up your operation with numbers Stacked and decimal points lined up.

$$\begin{array}{r} 4.73 \\ +2.85 \\ \hline \end{array}$$

Step 2 : Put a decimal point directly under the Sum line so all three decimal points are lined up.

$$\begin{array}{r} 4.73 \\ +2.85 \\ \hline . \end{array}$$

Step 3 : Solve the equation as if the decimal point is not there. Careful to keep the values lined up.

$$\begin{array}{r} {\scriptstyle 1}\,4.73 \\ +2.85 \\ \hline 7.58 \end{array}$$

Step 4 : Double check you have all the decimal points lined up in your final answer

$$\begin{array}{r} 4.73 \\ +2.85 \\ \hline 7.58 \end{array}$$

Subtraction examples :

$$\begin{array}{r} {\scriptstyle 7\ 1}\,8.25 \\ -4.62 \\ \hline 3.63 \end{array} \qquad \begin{array}{r} {\scriptstyle 0\ 11}\,12.38 \\ -\ 5.57 \\ \hline 6.81 \end{array}$$

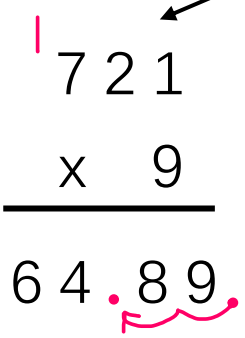
Addition examples :

$$\begin{array}{r} 7.{\scriptstyle 1}29 \\ +3.43 \\ \hline 10.72 \end{array} \qquad \begin{array}{r} {\scriptstyle 1\ 1}14.57 \\ +8.61 \\ \hline 23.18 \end{array}$$

Multiplying Decimals

Multiplying decimal numbers is similar to when working with whole numbers. You essentially ignore the decimal point, solve the equation (using any algorithm), and bring the decimal point back into the answer by counting how many numbers are after the decimal point in both numbers you are multiplying, then the answer should have that many numbers after its decimal point.

Example : 7.21 x 9 = 64.89

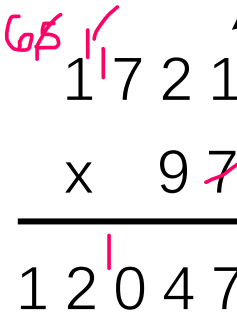


$$\begin{array}{r} 721 \\ \times \quad 9 \\ \hline 6489 \end{array}$$

700	20	1	
6300	180	9	9

$$\begin{array}{r} 6300 \\ 180 \\ +\quad 9 \\ \hline 6489 \end{array}$$

17.21 x 9.7 = 166.937



$$\begin{array}{r} 1721 \\ \times \quad 97 \\ \hline 12047 \\ +154890 \\ \hline 166937 \end{array}$$

10000	700	20	1	
90000	63000	1800	90	90
7000	4900	140	7	7

9000 + 7000 + 63000 + 4900 + 1800 + 140 + 7 + 90 = 166.937