

6 1 3 2
6 1 3 0

Rounding
(Nearest 10)

6 1 3 6
6 1 4 0

6 1 3 2
6 1 0 0

Rounding
(Nearest 100)

6 1 6 2
6 2 0 0

ROUNDING

- Underline the digit look next door.
- If it's 5 or greater add one more.
- If it's less than 5 leave it for sure.
- Everything after is a zero, not more.

6 1 3 2
6 0 0 0

Rounding
(Nearest 1000)

6 6 3 2
7 0 0 0

6 1 3 2 . 3
6 1 3 2 . 0

Rounding
(Nearest whole number)

6 1 3 2 . 7
6 1 3 3 . 0

ROUNDING

- Underline the digit look next door.
- If it's 5 or greater add one more.
- If it's less than 5 leave it for sure.
- Everything after is a zero, not more.

Addition vocabulary:

Addend + Addend = Total

Addend + Addend = Sum

$$5 + 2 = 7$$

$$123 + 27 = 150$$

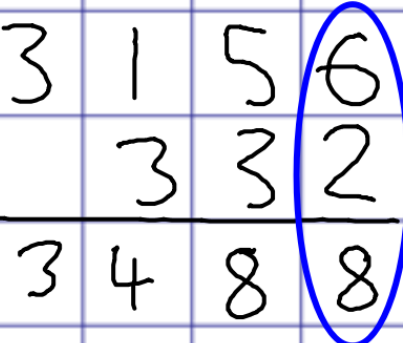
Pupils in Year 5 work with numbers up to One Million.

Pupils in Year 6 work with numbers up to Ten Million.



Addition


No carrying

$$\begin{array}{r} 3156 \\ + \quad 332 \\ \hline 3488 \end{array}$$


- Start on the right, and move to the left.

⊖ Add each digit that is in the same column.

Addition With carrying


$$\begin{array}{r} +1 \quad \quad +1 \\ 6132 \\ + \quad 919 \\ \hline 7051 \end{array}$$

- Start on the right, and move to the left.
- Add each digit that is in the same column.
- When your total is above 9, carry the Tens digit into the next column and write it at the top (e.g. $2 + 9 = 11$)

$$\begin{array}{r}
 314.9 \\
 + \quad \quad \quad \cdot 16 \\
 \hline
 315.06
 \end{array}$$

A red arrow points left above the grid. A red circle contains '+1' above the tens column. A red oval encircles the decimal points. A blue oval encircles the digits 9 and 1 in the tenths column.

Addition
 involving
 decimals
 With carrying

- ⊖ Line up the decimal points (or where they would be if using whole numbers).
 - Start on the right, and move to the left.
- ⊖ Add each digit that is in the same column (e.g. $9 + 1 = 10$).
- ⊖ When your total is above 9, carry the Tens digit into the next column and write it at the top (e.g. $2 + 9 = 11$)

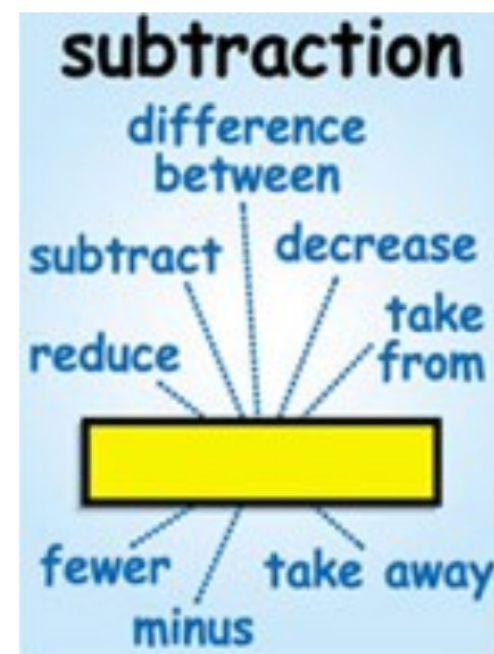
Subtraction vocabulary:

$$\begin{array}{r} \text{Minuend} - \text{Subtrahend} = \text{Difference} \\ 5 - 2 = 3 \end{array}$$


$$123 - 27 = 96$$

Pupils in Year 5 work with numbers up to One Million.

Pupils in Year 6 work with numbers up to Ten Million.




Subtraction
No exchanges


$$\begin{array}{r} 4627 \\ - 504 \\ \hline 4123 \end{array}$$

- Start on the right, and move to the left.

⊖ Subtract each digit that is in the same column.

Subtraction With exchanges


$$\begin{array}{r} 48704 \\ - 1805 \\ \hline 3909 \end{array}$$

- Start on the right, and move to the left.
- Subtract each digit that is in the same column.
- If you cannot subtract (for example, $4-5$), move to the next column and exchange by subtracting 1.
- Bring this into your calculation ($14-5$) and subtract.

$$\begin{array}{r}
 45007 \\
 - 128 \\
 \hline
 4379
 \end{array}$$

Subtraction
With exchanges
across 0
(column method)

- Start on the right, and move to the left.
- Subtract each digit that is in the same column.

- ⊖ If you cannot subtract (for example, $4-5$), move to the next column and exchange by subtracting 1. If there is a 0, move to the next column.
- ⊖ Bring this into your next column, and if needed exchange again until you are at your original column with 0.

Subtraction
With exchanges
across 0
(linked facts)



5 0 0 7

- 1 2 8

4 8 7 9

4 9 9 9

1 2 0

4 8 7 9

Subtract 8
from both
numbers to
make it
simpler.
Now, we
don't have
any
exchanges.



- ⊖ Sometimes it may be easier to use linked facts to help with subtraction. Here, we can subtract 8 from both numbers to make the calculation easier.
 - Start on the right, and move to the left.
- ⊖ Subtract each digit that is in the same column.

$$\begin{array}{r}
 17\overset{2}{\cancel{8}}0 \\
 + 31.6 \\
 \hline
 141.4
 \end{array}$$

A red arrow points left from the top of the grid. A red circle is around the 8 with a '2' above it. A blue circle is around the 0. A red oval is around the 8 and 0. A blue oval is around the 0 and 6.

Subtraction involving
decimals

With carrying

⊖ Line up the decimal points (or where they would be if using whole numbers).

- Start on the right, and move to the left.

- Subtract each digit that is in the same column.

⊖ If you cannot subtract (for example, $0-6$), move to the next column and exchange by subtracting 1.

⊖ Bring this into your calculation ($10-6$) and subtract.

Multiplication vocabulary:

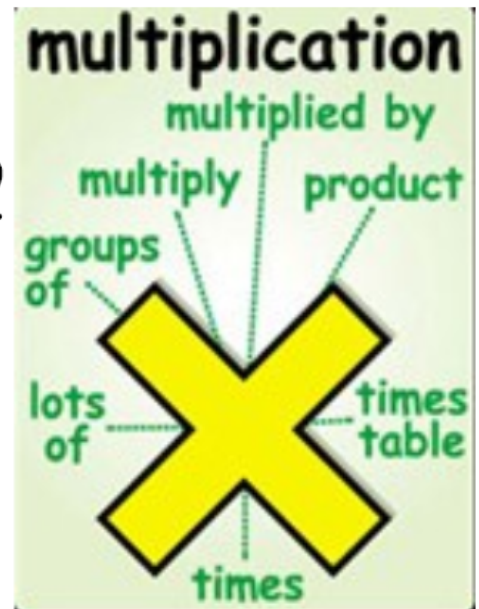
Multiplicand \times Multiplier = Product

Factor \times Factor = Multiple

$$5 \times 2 = 10$$

$$56 \times 2 = 112$$

Pupils in Years 5 and 6 should know all of their times tables facts (multiplication and division) up to 12×12 .



$$\begin{array}{r} 31 \\ \times 10 \\ \hline \end{array} =$$

Multiplication by
10, 100 or 1,000

$$\begin{array}{r} 31 \\ \times 100 \\ \hline \end{array} =$$

① Count the number of 0's in 10, 100 or 1,000.

② Move each digit the same number of places to the left.

③ Where required, put placeholder 0's in the columns.

$$\begin{array}{r} 31 \\ \times 1000 \\ \hline \end{array}$$

$$31 \times 20 =$$



$$\times 10 \quad \times 2$$

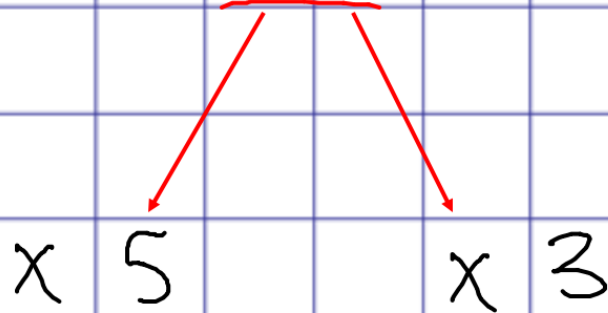
Multiplication
using linked facts
(multiple of 10)

$$31 \times 10 = \underline{310}$$

$$310 \times 2 = 620$$

- ⊖ Multiplying can be simplified by using knowledge of factors. 2 factors of 20 are '10' and '2'. When we multiply by 10 AND 2, this is the same as multiplying by 20.
- ⊖ Multiply the number by the first multiplier.
- ⊖ Multiply the product by the second multiplier.

$$21 \times 15 =$$



Multiplication
using linked facts
(other multiples)

⊖ Multiplying can be simplified by using knowledge of factors. 2 factors of 15 are '5' and '3'. When we multiply by 5 AND 3, this is the same as multiplying by 15.


$$21 \times 5 = \underline{105}$$

⊖ Multiply the number by the first multiplier.

$$105 \times 3 = 315$$

⊖ Multiply the product by the second multiplier.

Multiplication
No carrying


$$\begin{array}{r} 1123 \\ \times \quad 3 \\ \hline 3369 \end{array}$$

- Start on the right, and move to the left.
- ⊖ Multiply each digit by the Ones digit (e.g. $3 \times 3 = 9$).

Multiplication With carrying

$$\begin{array}{r} \text{+1} \quad \underline{\text{+1}} \\ 1342 \\ \times \quad \quad \quad \underline{4} \\ \hline 5368 \end{array}$$

- Start on the right, and move to the left.

⊖ Multiply each digit by the Ones digit (e.g. $2 \times 4 = 8$).

⊖ If your product is above 9, carry the Tens digit to the next column (e.g. $4 \times 4 = 16$).

⊖ The number that has been carried gets added after your multiplication (e.g. $4 \times 3 = 12$. $12 + 1 = 13$).

$$\begin{array}{r}
 \text{+1} \\
 \hline
 41.3 \\
 \times 3 \\
 \hline
 123.9
 \end{array}$$

Multiplication
involving decimals
With carrying

- ⊖ Line up the decimal points (or where they would be if using whole numbers).
 - Start on the right, and move to the left.
- ⊖ Multiply each digit by the Ones digit
- ⊖ If your product is above 9, carry the Tens digit to the next column (e.g. $4 \times 4 = 16$).
- ⊖ The number that has been carried gets added after your multiplication (e.g. $4 \times 3 = 12$. $12 + 1 = 13$).

Multiplication by 2-digit numbers

$$\begin{array}{r} \begin{array}{r} + \\ + \end{array} \\ 316 \\ \times \quad 23 \\ \hline 948 \\ + 6320 \\ \hline 7268 \end{array}$$

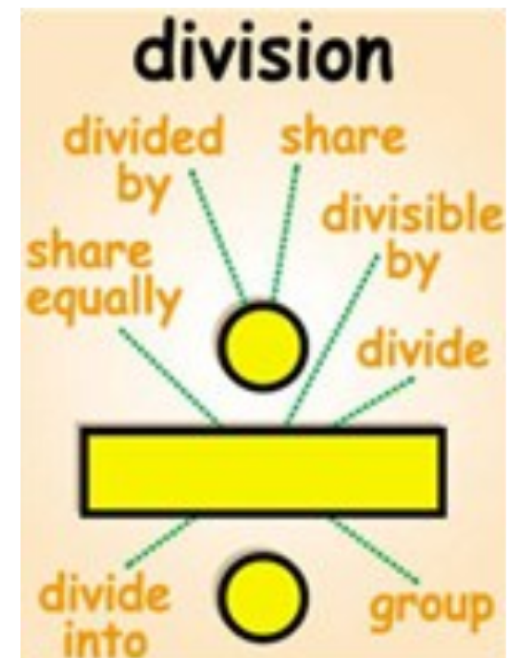
- Start on the right, and move to the left.
- Multiply the top number by the Ones digit (e.g. 316×3).
- If your product is above 9, carry the Tens digit to the next column (e.g. $4 \times 4 = 16$).
- Put your placeholder 0 in the Ones column.
- Multiply the top number by the Tens digit (e.g. 316×2).
- Add the two products together.

Division vocabulary:

$$\text{Dividend} \div \text{Divisor} = \text{Quotient}$$
$$10 \div 2 = 5$$

$$56 \div 2 = 28$$

Pupils in Years 5 and 6 should know all of their times tables facts (multiplication and division) up to 12×12 .



$$31.0 \div 10 =$$

$$3.10$$

Dividing by 10,
100 or 1,000

$$31.0 \div 100 =$$

$$0.31$$

⊖ Count the number of 0's in 10, 100 or 1,000.

⊖ Move each digit the same number of places to the right. The decimal point stays in the same place.

$$31.0 \div 1000 =$$

$$0.031$$

⊖ Where required, put a decimal point after your Ones column.

$$311 \div 100 =$$

$$3.11$$

3

6

9

1 2

1 5

1 8

2 1

2 4

2 7

3 0



3 0 2 1

3 | 9 0 6 3

Short Division
No exchanges

- ⊖ Write your times table to assist you.
- Start on the left, and move to the right.
- ⊖ Divide each digit by the divisor (e.g. $9 \div 3 = 3$)

Please note: Pupils can use EITHER short OR long division to solve questions.

Short Division With exchanges

	3								
	6								
	9								
1	2		3	1	5	1			
1	5	3	9	<u>4</u>	1	5	3		
1	8								
2	1								
2	4								
2	7								
3	0								

- ⊖ Write your times table to assist you.
- Start on the left, and move to the right.
- Divide each digit by the divisor (e.g. $9 \div 3 = 3$)

- ⊖ If you cannot divide it exactly, anything remaining gets exchanged to the next column (e.g. $4 \div 3 = 1$ with 1 remainder)

Please note: Pupils can use EITHER short OR long division to solve questions.

Short Division With exchanges and remainders

	4																		
	8																		
1	2																		
1	6		0	3	0	7		r	2										
2	0	4		1	2	<u>8</u>	0												
2	4																		
2	8																		
3	2																		
3	6																		
4	0																		

- ⊖ Write your times table to assist you.
- Start on the left, and move to the right.
- Divide each digit by the divisor (e.g. $1 \div 4 = 0$)
- ⊖ If you cannot divide it exactly, anything remaining gets exchanged to the next column (e.g. $1 \div 4 = 0$ with 1 remainder)
- ⊖ If a remainder is left at the end, write this with a 'r' and then the number.

Please note: Pupils can use EITHER short OR long division to solve questions.

$$620 \div 20 =$$



Division using
linked facts
(multiple of 10)

$$\div 10 \quad \div 2$$

⊖ Division can sometimes be simplified by using knowledge of factors. 2 factors of 20 are '10' and '2'. When we divide by 10 AND 2, this is the same as dividing by 20.

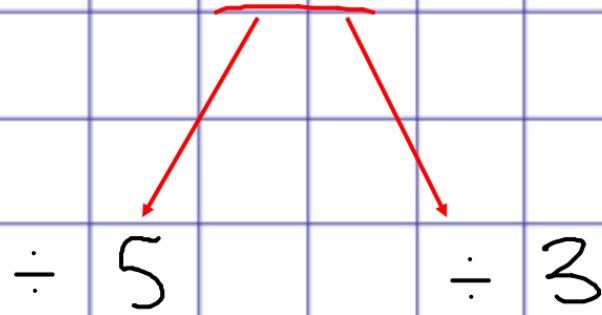
$$620 \div 10 = \underline{62}$$

⊖ Divide the number by the first dividend.

$$62 \div 2 = 31$$

⊖ Divide the product by the second dividend.

$$600 \div 15 =$$



Division using
linked facts
(other multiples)

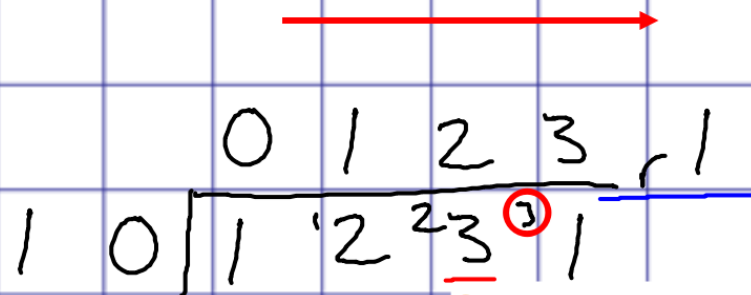
$$600 \div 5 = 120$$

$$120 \div 3 = 40$$

- ⊖ Division can sometimes be simplified by using knowledge of factors. 2 factors of 15 are '5' and '3'. When we divide by 5 AND 3, this is the same as dividing by 15.
- ⊖ Divide the number by the first dividend.
- ⊖ Divide the product by the second dividend.

1	0									
2	0									
3	0									
4	0									
5	0									
6	0									
7	0									
8	0									
9	0									
1	0	0								

Short Division
by 2 digits
With exchanges
and remainders



- ⊖ Write your times table to assist you.
 - Start on the left, and move to the right.
 - Divide each digit by the divisor (e.g. $1 \div 3 = 0$)
- ⊖ If you cannot divide it exactly, anything remaining gets exchanged to the next column (e.g. $23 \div 10 = 2$ with 3 remainder)
- ⊖ If a remainder is left at the end, write this with a 'r' and then the number.

Note: We are using $\div 10$ here as a simple example, and would NOT recommend short division when dividing by 10. Instead, see the 'Dividing by 10, 100 or 1,000' page.

Please note: Pupils can use EITHER short OR long division to solve questions.

	4																			
	8																			
1	2	4		1 ⁰	2	8	0	.	2	0										
1	6																			
2	0																			
2	4																			
2	8																			
3	2																			
3	6																			
4	0																			

Short Division
With exchanges and remainders shown as decimals

- Write your times table to assist you.
- Start on the left, and move to the right.
- Divide each digit by the divisor (e.g. $1 \div 4 = 0$)
- If you cannot divide it exactly, anything remaining gets exchanged to the next column (e.g. $1 \div 4 = 0$ with 1 remainder)
- If a remainder is left at the end, place a decimal point and then a 0. Write your remainder above the 0 and then divide by the divisor (e.g. $20 \div 4 = 5$)

Please note: Pupils can use EITHER short OR long division to solve questions.

3									
6			0	8	6	2	r	1	
9		3	2	5	8	7			
1	2	-	2	4					
1	5			1	8				
1	8	-		1	8				
2	1				0	7			
2	4					6			
2	7					1			
3	0								

Long Division by
1 digits
With exchanges

- ⊖ Write your times table to assist you.
- Move from left to right. Follow the same method as short division.
- ⊖ If the number can be divided, write the multiple underneath and subtract it.
- ⊖ Bring your exchange into the next column and continue.
- Any remainders can be written at the end, or converted to decimals.

Please note: Pupils can use EITHER short OR long division to solve questions.

Fraction vocabulary:

$$\frac{1}{2}$$

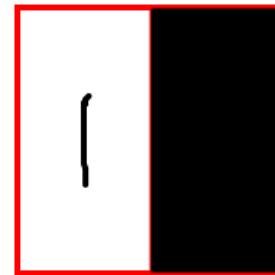


Numerator
The total number
of parts



Denominator
The number of
parts that we
have.

"I have 1 part. My
numerator is 1."



"In total, there are
2 parts. The
denominator is 2."

$$\frac{1}{2} = \frac{?}{4}$$

$$\frac{1}{2} = \frac{\quad}{4}$$

$\times 2$

$$\frac{1}{2} = \frac{2}{4}$$

$\times 2$

$$\frac{3}{4} = \frac{15}{?}$$

$$\frac{3}{4} = \frac{15}{\quad}$$

$\times 5$

$$\frac{3}{4} = \frac{15}{20}$$

$\times 5$

Equivalent fractions

- ⊖ Look at the information that you have been given.
- ⊖ Find which multiplication fact has been used.
- ⊖ Multiply the other digit by the same thing.

Simplifying fractions

$$\frac{8}{12} = \frac{?}{?}$$

$$\frac{8}{12} \xrightarrow{\div 4} \frac{2}{3}$$

$$\frac{2}{3}$$

$$\frac{8}{12} \xrightarrow{\div 2} \frac{4}{6} \xrightarrow{\div 2} \frac{2}{3}$$

- Look at the information that you have been given.
- Find the highest-common factor of the numerator and denominator, e.g.: The highest-common factor of 8 and 12 is 4.
- Divide both digits by the highest-common factor.
- If you cannot find the highest-common factor, use a common factor and then check if you can simplify further.

Converting Improper Fractions to Mixed Numbers.

$$\frac{5}{2} =$$

$$5 \div 2 = 2 \text{ r } 1$$

$$\frac{5}{2} = 2 \frac{1}{2}$$

- Divide the numerator by the denominator.

- The whole answer is your whole number.

- If there is a remainder, write this as the new numerator.

- The denominator stays the same.

Converting Mixed Numbers to Improper Fractions.

$$2 \frac{1}{3} =$$

$$2 \times 3 = 6$$

$$6 + 1 = 7$$

$$2 \frac{1}{3} = \frac{7}{3}$$

- Multiply the whole number by the denominator.
- Add the numerator to your product. This gives you your new numerator.
- The denominator stays the same.

$$\frac{1}{6} + \frac{2}{6} = ?$$

Adding
Fractions
(same
denominators)

$$\frac{1}{6} + \frac{2}{6} = \frac{3}{6}$$

- Add the numerators (the top numbers).
- Leave the denominators (the bottom numbers) the same.

$$\frac{1}{2} + \frac{1}{4} =$$

Adding
Fractions
(different
denominators)

$$\frac{1}{2} \xrightarrow{\times 2} \frac{2}{4}$$

$$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

- ⊖ Find an equivalent fraction by multiplying.
- ⊖ Add the numerators (the top numbers).
- ⊖ Leave the denominator (the bottom numbers) the same.

$$\frac{7}{9} - \frac{3}{9} = ?$$

Subtracting
Fractions
(same
denominators)

$$\frac{7 - 3}{9} = \frac{4}{9}$$

⊖ Subtract the numerators (the top numbers).

⊖ Leave the denominators (the bottom numbers) the same.

$$\frac{3}{4} - \frac{1}{8} = ?$$

Subtracting
Fractions
(different
denominators)

$$\frac{3}{4} \xrightarrow{\times 2} \frac{6}{8}$$

$$\frac{6}{8} - \frac{1}{8} = \frac{5}{8}$$

- ⊖ Find an equivalent fraction by multiplying.
- ⊖ Subtract the numerators (the top numbers).
- ⊖ Leave the denominator (the bottom numbers) the same.

Multiplying Fractions

$$\frac{1}{3} \times \frac{2}{4} = ?$$

$$\frac{1}{3} \times \frac{2}{4} = \frac{2}{12}$$

⊖ Multiply the numerators (the top numbers).

⊖ Multiply the denominators (the bottom numbers).

$$\frac{2}{8} \div 2 = ?$$

Dividing Fractions by whole numbers

$$\frac{2}{8} \div \frac{2}{1} =$$

$$\frac{2}{8} \times \frac{1}{2} = ?$$

$$\frac{2}{8} \times \frac{1}{2} = \frac{2}{16}$$

- Turn your whole number into an improper fraction, by writing '1' as the denominator.
- 'Flip' one of your fractions over.
- Replace the division symbol with multiplication.
- Multiply the numerators (the top numbers).
- Multiply the denominators (the bottom numbers).

$$\frac{3}{8} \text{ of } 96 =$$

Fractions of amounts

$$\begin{array}{r} 12 \\ 8 \overline{)96} \end{array}$$

⊖ Divide the whole number by the denominator (the bottom number).

⊖ Multiply your answer by the numerator (the top number).

$$12 \times \underline{3} = 36$$

1% of 350

Percentages of amounts (1%)

$$\underline{350} \div \underline{100}$$

$$\begin{array}{r} 350. \\ \xrightarrow{\quad} \\ 3.50 \end{array}$$

- ⊖ Divide the whole number by 100.
- ⊖ As 100 has two 0's, move each digit 2 places to the right.

20% of 350

Percentages of amounts (any%)

$$\underline{350} \div \underline{100}$$

⊖ Divide the whole number by 100.

$$\begin{array}{c} 350. \\ \swarrow \\ 3.50 \end{array}$$

$$\begin{array}{r} +1 \\ 3.5 \end{array}$$

⊖ As 100 has two 0's, move each digit 2 places to the right.

⊖ Multiply your answer by the percentage that you are finding.

$$\begin{array}{r} \times 20 \\ \hline 0.0 \\ + 70.0 \\ \hline 70.0 \end{array}$$

$$\underline{20} \times 3.5 =$$

$$70.0$$