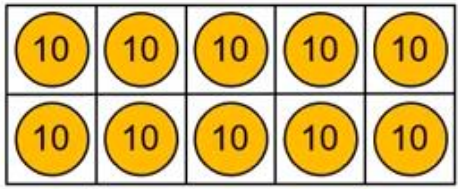
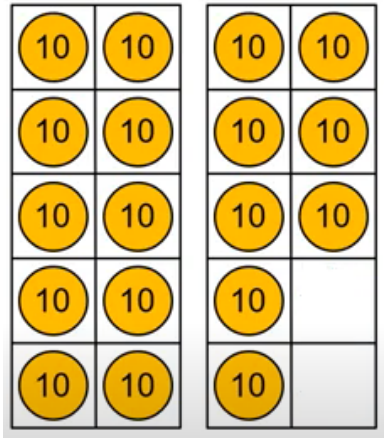
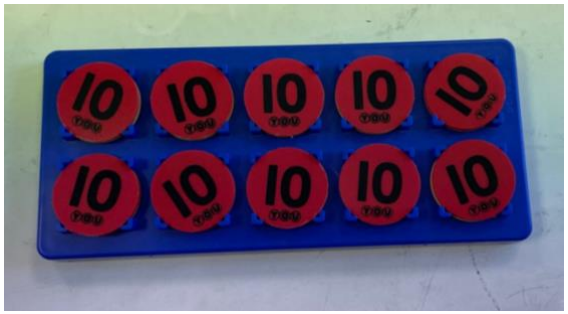
Maths Resources & Representations in Year 3

Ten Frame



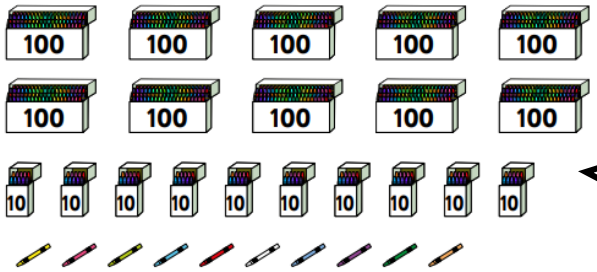
Did you know that 10 lots of 10 is equivalent to 100?





What is 18 lots of ten is equal to ....?

How many sweets are there?



Can you circle 316 crayons?

The Year 3 Maths Curriculum

In year 3, our pupils continue to build on mastering their maths skills from key stage 1. They are equipped with a better understanding of place value from using a variety of concrete resources in key stage 1. They continue to apply these skills to represent and solve problems with three-digit numbers.

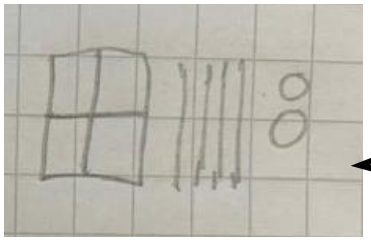
Ten Frame

Using multiple ten frames and place value counters enables pupils to work with increasing confidence with numbers beyond 100, showing an increasing awareness and understanding of three-digit multiples of ten.

Pupils will need to be able to discuss, compare and sequence numbers to a 1000 confidently.

They learn to count confidently in multiples and apply this skill when solving pictorial maths problems.

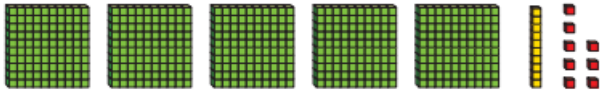
Base 10 Equipment

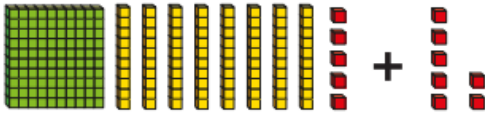


142

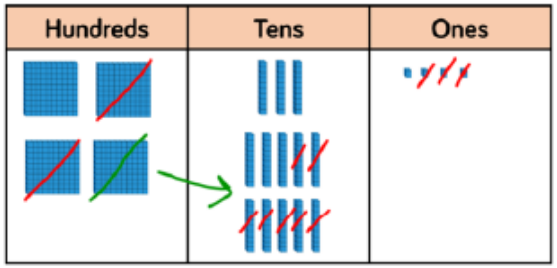
Here a pupil has completed a calculation. They have represented their maths pictorially.

This represents 418? True or False?

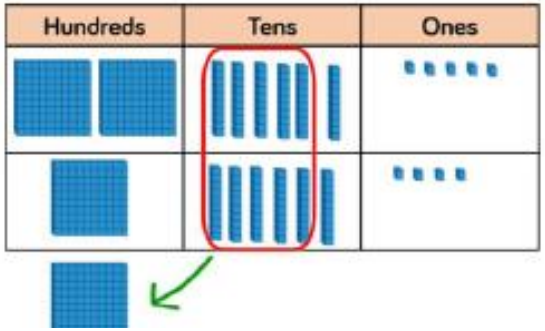




Can you complete the calculation?



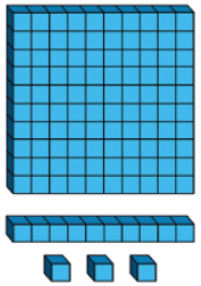
$$\begin{array}{r} {}^{3}\not{4}{}^{1}35 \\ -\ 273 \\ \hline 262 \end{array}$$



$$\begin{array}{r} 265 \\ +\ 164 \\ \hline 429 \\ \hline 1 \end{array}$$

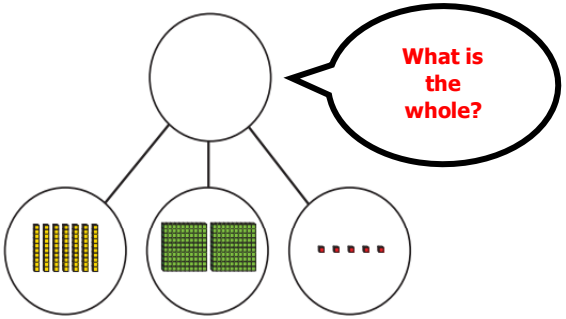
Base 10 Equipment:

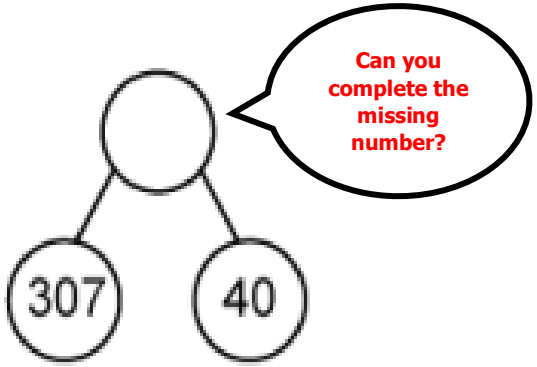
Base 10 equipment exposes the structures of numbers. In year 3, pupils use base 10 equipment efficiently to represent the value of 100, 10 and 1.

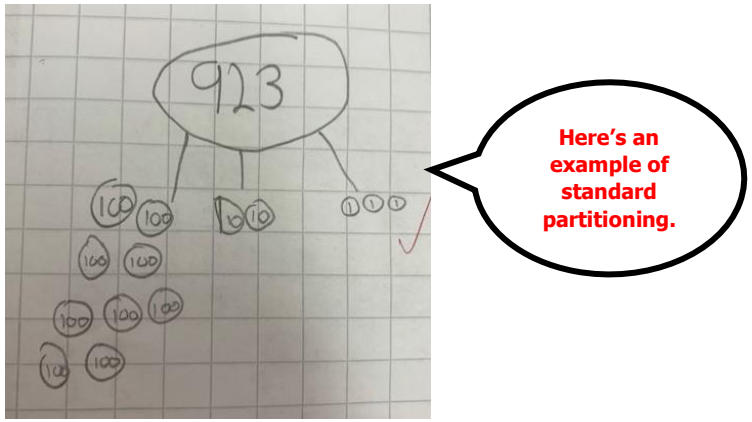


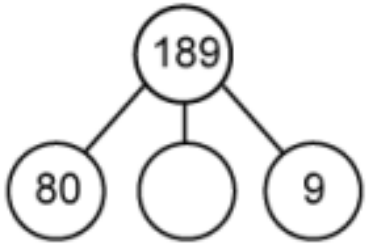
In year 3, pupils will learn to add and subtract using a formal method. They will explore this through using concrete resources first and then progress to a written method. As they add and subtract three-digit numbers, they will cross multiples of 10. They learn to do this by making an exchange. Base 10 is an excellent manipulative in order for children to be able to calculate three-digit numbers concisely.

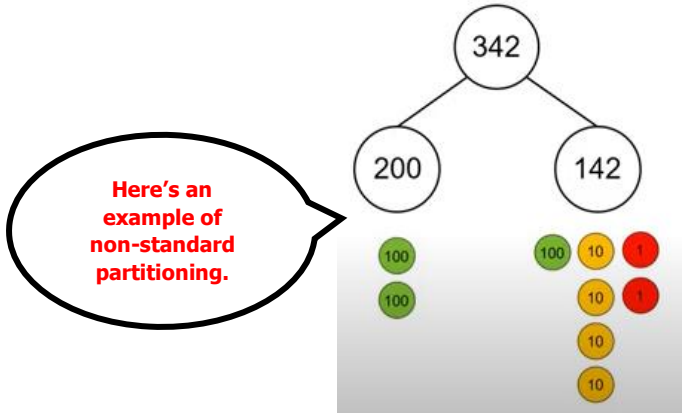
Part Whole Model

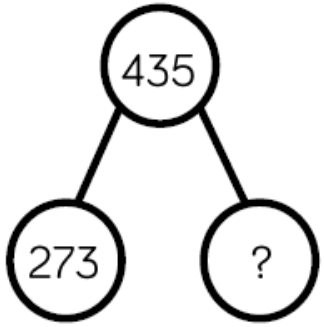












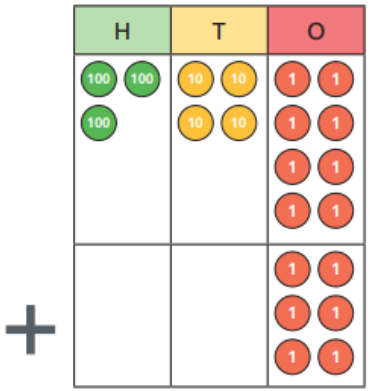
Part Whole Model:

The part whole model can be represented using images, concrete resources or numbers. Pupils learn to compose quantities of two or more parts. When the parts are complete and the whole is empty, pupils use aggregation to add the parts together to find the total. When the whole is complete and at least one of the parts are empty pupils use partitioning (a form of subtraction) to find the missing part.

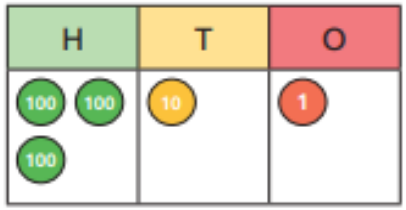
Pupils will learn to expand their understanding of three-digit numbers; they will compose and decompose three-digit numbers using a part whole model. They will partition numbers using standard and non-standard partitioning.

Maths Resources & Representations in Year 3

Place Value Counters

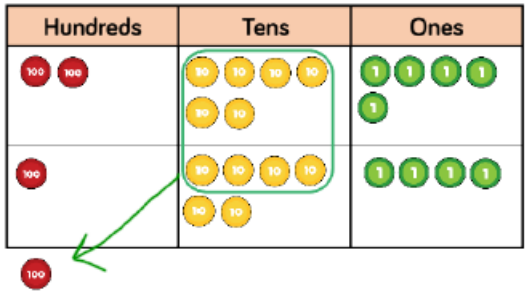


Here's an example of a place value grid and place value counters being used to add two numbers together using the column method. In this calculation the pupil will need to make an exchange.

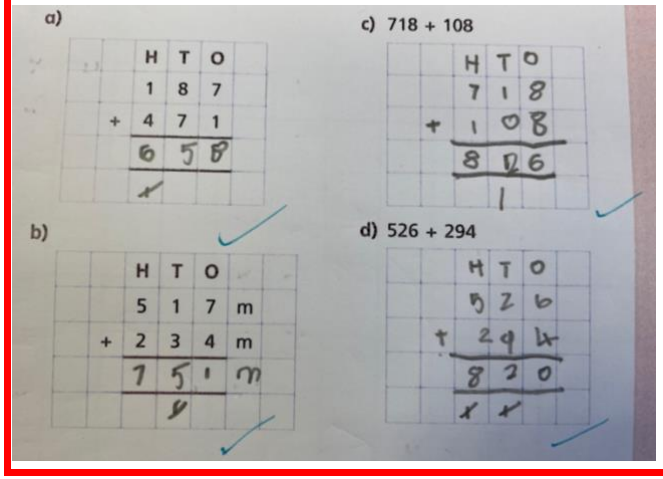


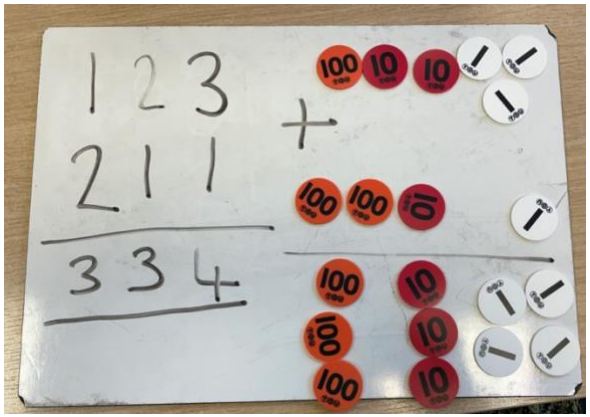
317 – 7 =

In this calculation the pupil will need to make an exchange.



$$\begin{array}{r} 265 \\ +\ 164 \\ \hline 429 \\ \hline 1 \end{array}$$





Place Value Counters

Place value counters are a well-used resource in year 3 and make an excellent tool to support pupil's mathematics.

By using a place value grid and place value counters, the value of each digit is very explicit. Place value counters (as well as Base 10) are an excellent manipulative for pupils to use in order to add and subtract three-digit numbers concisely.

As pupils develop a secure understanding of place value, they learn to add and subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds.

Maths Resources & Representations in Year 3

Problem Solving & Reasoning

Ron is thinking of a number.

My number has an even number of tens. There are 2 more hundreds than there are ones. One of the digits is a 6

Circle the numbers that Ron could be thinking of.

286	**462**	**385**
614	**604**	**328**

8 × 8 is greater than two lots of 4 × 8

Is this true or false? How do you know?

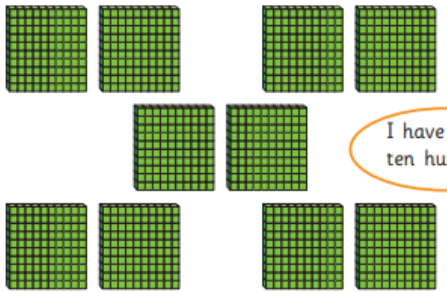
Dora wants to buy a new computer.

She has saved £287

Each month she saves another £100

How many more months will it take Dora to save enough to buy the computer?

Jack makes this number.



I have made ten hundred.

Is Jack correct?

6 lots of 3 is 6 more than 5 lots of 3

Do you agree with Dora?

Problem Solving & Reasoning

As pupils develop a secure understanding of place value and number, they develop the ability to reason mathematically and solve multi-step number problems.

They will encounter a range of mathematical problems that involve using concrete, pictorial and abstract representations.

Pupils are encouraged to talk about their maths verbally in class discussions. With the support of the class teacher, pupils are always encouraged to use mathematical vocabulary to explain their answers.

True or False?

Can you prove it?

Is that true sometimes, always or never?

How do you know that?

Maths Resources & Representations in Year 3

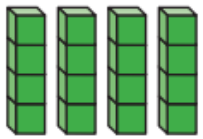
Multiplication & Division

How many pencils are there altogether?

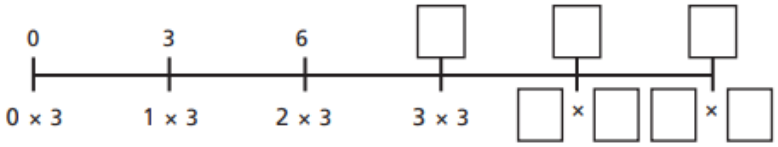
What do you notice?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

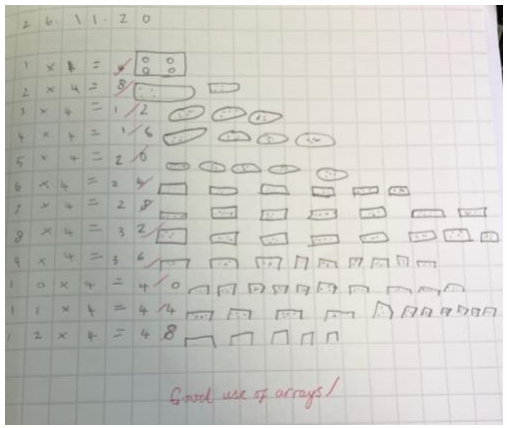
Complete the number sentence.

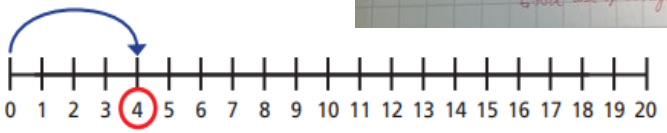


4 × 3 = ☐



Complete the number line.





Can you circle all of the numbers in the 4 times tables?

Which numbers divide exactly by 8? How did you work that out?

23 28 32 64 65

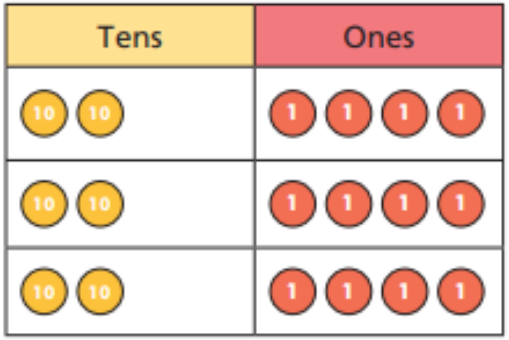
Multiplication & Division

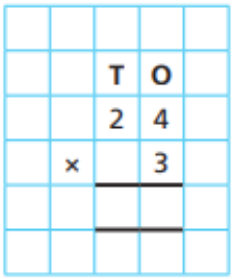
In year 3, pupils will learn to recall the 2, 5, 10, 4, 8 and 3 multiplication tables, as well as know the corresponding division facts. They use and apply this knowledge across a range of contexts.

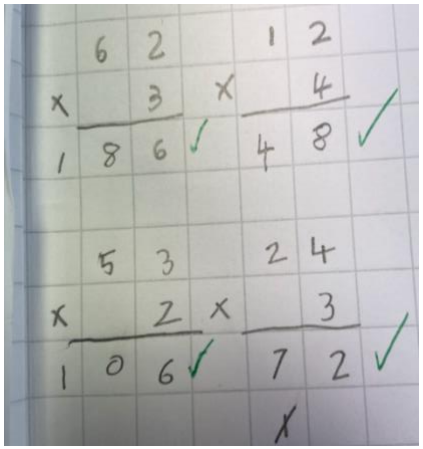
Pupils are encouraged to solve problems by counting in multiples. When a pupil knows their multiplication facts fluently, they are able to solve multiplication and division problems more efficiently.

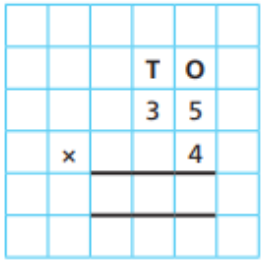
They will be taught to look for patterns in the multiplication tables, for example noticing how the multiples in the 8 times tables is double the multiples in the 4 times tables.

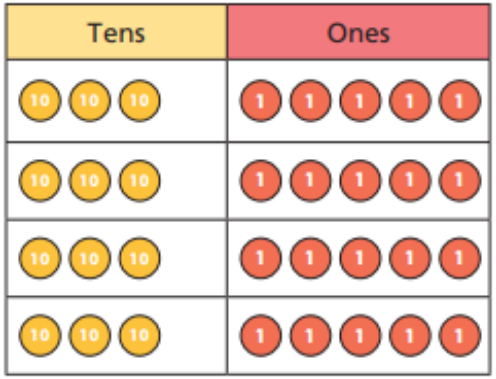
Maths Resources & Representations in Year 3



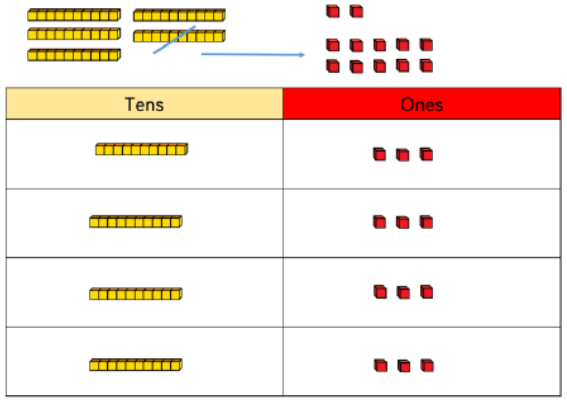


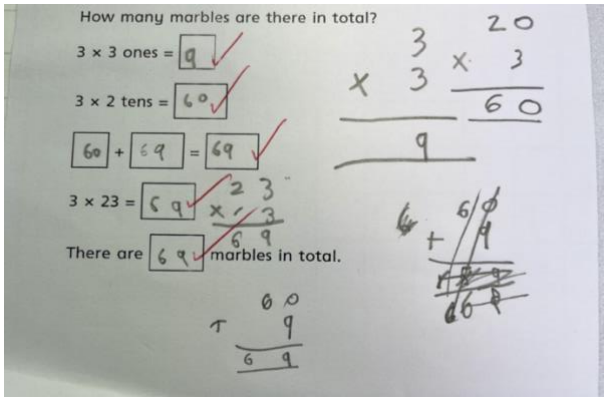






$52 \div 4 = 13$





Multiplication & Division

In year 3, pupils will learn to multiply two-digit numbers by one-digit numbers using concrete and pictorial representations and then progressing to a written formal method.

Place value counters and Base 10 are excellent tools for pupils to use when multiplying and dividing.

By using maths manipulatives first pupils will have a greater understanding of the abstract process (written formal methods.)

Acknowledgements:

Some representations have been taken from White Rose Maths, NCETM and Twinkl. These are a sample of questions that the children use in class.