Place Value & Mental Maths

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Maths Subject Lead

Maths Curriculum

- *Maths is a compulsory national curriculum subject and is taught daily. During the* ***Early Years Foundation Stage (Nursery & Reception)****, children take part in short whole class carpet sessions which are followed up with small group focus sessions. Children take part in free flow maths-related activities and continuous provision. During* ***Key Stage 1(Year 1 & Year 2)*** *, children have daily lessons lasting an hour.*

What does Maths look like in Winterbourne Nursery & Infants School

- *At Winterbourne Nursery and Infant School, we intend to provide a **broad and balanced curriculum** which caters for the **needs of all individual children** and prepares them with the necessary skills and knowledge to become successful in their future adventures. We incorporate sustained levels of challenges through **varied and high quality activities with a focus on fluency, reasoning and problem solving**. Pupils are expected to explore maths in depth, using mathematical vocabulary to reason and explain their working out. A wide range of mathematical resources are used and pupils are taught to show their working out in a concrete, pictorial and abstract form when it is suitable. Throughout the school children are taught and encouraged to explain their choice of methods and **develop their mathematical reasoning skills using stem sentences.***

Place Value & Mental Maths

- *Today we are here to explore the importance of place value and mental arithmetic in Maths.*
- *I will highlight the value of these skills within our Maths curriculum.*
- *I will demonstrate how it is used in class.*
- *Finally I will show you ways that you can incorporate this at home and support your child in their understanding of number.*

thousands	hundreds	tens	ones
4	0	7	4
4,000	000	70	4

hundreds	tens	ones
3	8	2
300	80	2

Mental Maths

- *The mental method, also known as mental maths, is the process of working out maths calculations and carrying out problem-solving mentally, without the need to write down any working out. Children will learn to complete mental subtraction, addition and other mental calculations, which involve using specific techniques for solving different types of problems rather than memorizing the answers to equations, whipping out a calculator, or using a pen and paper for their workings.*

Why is Mental Maths important?

- *It helps children to develop problem-solving skills that promote faster calculations. It also allows children to see the relationship between numbers and the patterns they make. As children progress in their primary education, they'll also be expected to complete more complex calculations in their head, so getting a grip of mental maths techniques at an early age will put them in great stead for this.*

Why is Mental Maths important?

- *Without the ability to do mental maths, it can be difficult to complete ordinary daily tasks such as counting money, taking measurements and even calculating time. For example, most of us don't think twice about working out how long it is until the next bus or train is due! That's why learning to complete mental subtraction, addition and other calculations is an important life skill. In fact, it's one of the most applicable parts of maths in real-life. By giving children the tools that they need to master mental maths, you're opening up a world of possibilities and giving them a great deal of independence. It also improves their memory skills, which will benefit them in all aspects of their learning journey. Mental maths is the key to confidence and fluency.*
- ***Rather than it needing to be at the forefront of their learning, it's an essential tool that will ensure children are engaged with the rest of the curriculum.***

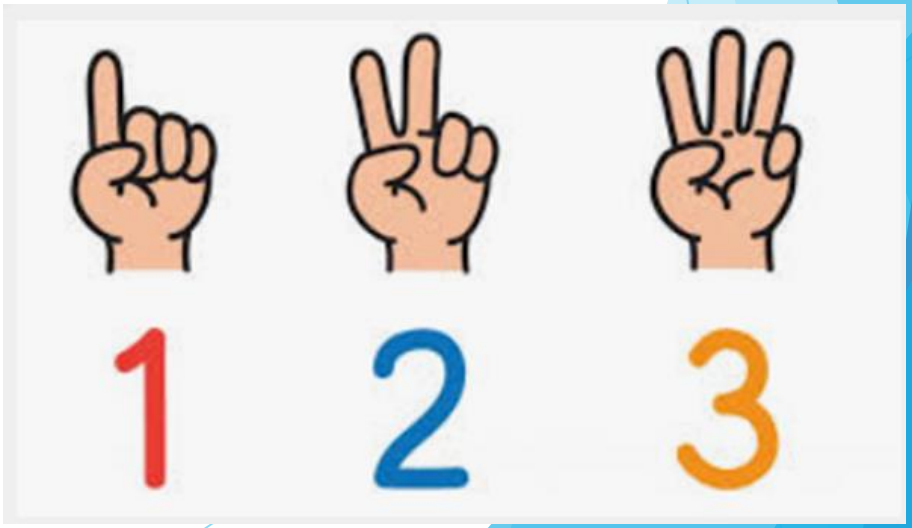
Why is Mental Maths important?

There are some important skills that children will gain from practising mental maths. Here are a few:

- ***Recalling facts*** *- Mental maths is a great test of memory and regular practice will ensure that some mathematical problems are second nature to learners. This is a foundational element of mathematics, which will stand them in good stead for more complicated sums later on.*
- ***Mathematical speed*** *- It's all about speed! There are lots of reasons why speed is good for doing sums. From standing in line at the checkout to completing exams, speed is on your side when you learn mental maths.*
- ***Estimating calculations*** *- Learning how to estimate the answer is a brilliant, real-world skill that children can learn as part of mental maths. They can do this by rounding numbers up or down before they do any sums.*

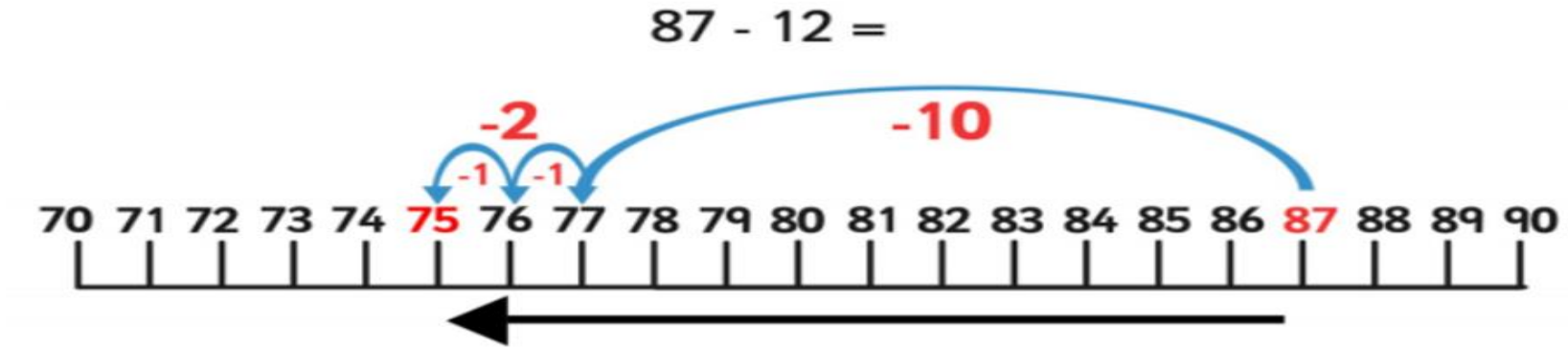
Subitising- Early Years

- *Subitising helps children to see, solve, and manipulate numbers in their head. This develops their number sense and helps them master key calculation strategies at an early stage. Often young children learn to count but don't fully understand the relationship between numbers and amounts. It is the skill of instantly seeing how many items are in a group. For example, if I hold up my hand, you wouldn't have to count my fingers and thumb to know it's five.*



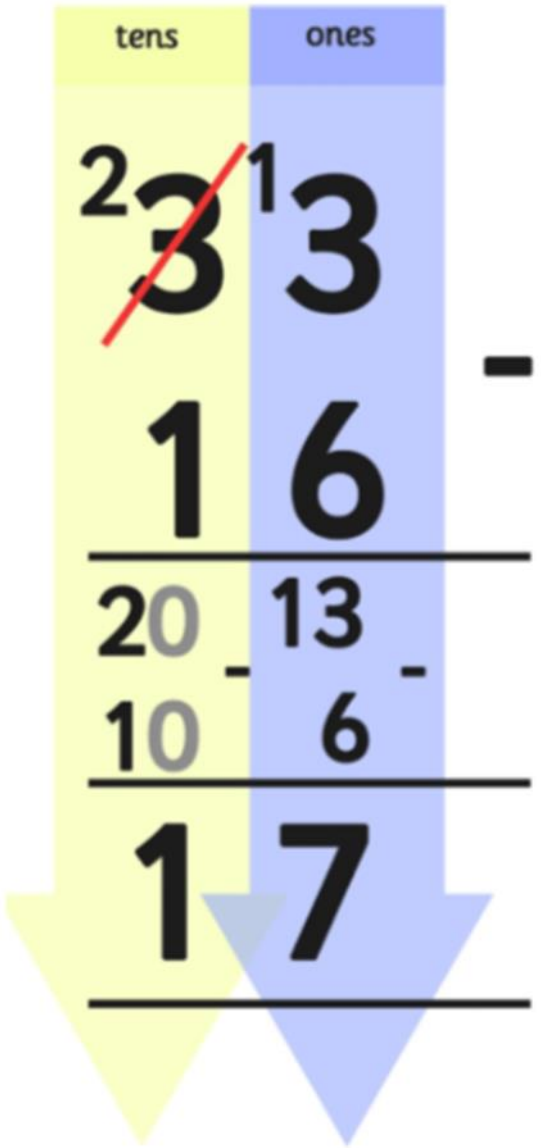
Counting back- Year 1

- *This is a useful strategy to apply when subtracting smaller numbers. Children will be taught to use it together with a number line or a number square at first, but then they will be able to complete it mentally.*
- *Using a number line is an example of the CPA (concrete, pictorial, abstract) method of learning. Allowing children to visualise numbers on a number line is one step closer to them being able to work out the entire mental maths problem in their heads.*
- *Let's look at the example below. If we want to subtract 12 from 87, we can take the smaller number, which in this case is 12. It's the sum of 10 and 2, and since it's easy to subtract 10 from any number, let's take it away from 87.*
- *So, 87 minus 10 equals 77. Easy, right? Now, we need to subtract 2 from 77. Why? Because we had the number 12 - we took 10 away, and now we need to take away 2 more. That leaves us with 75.*



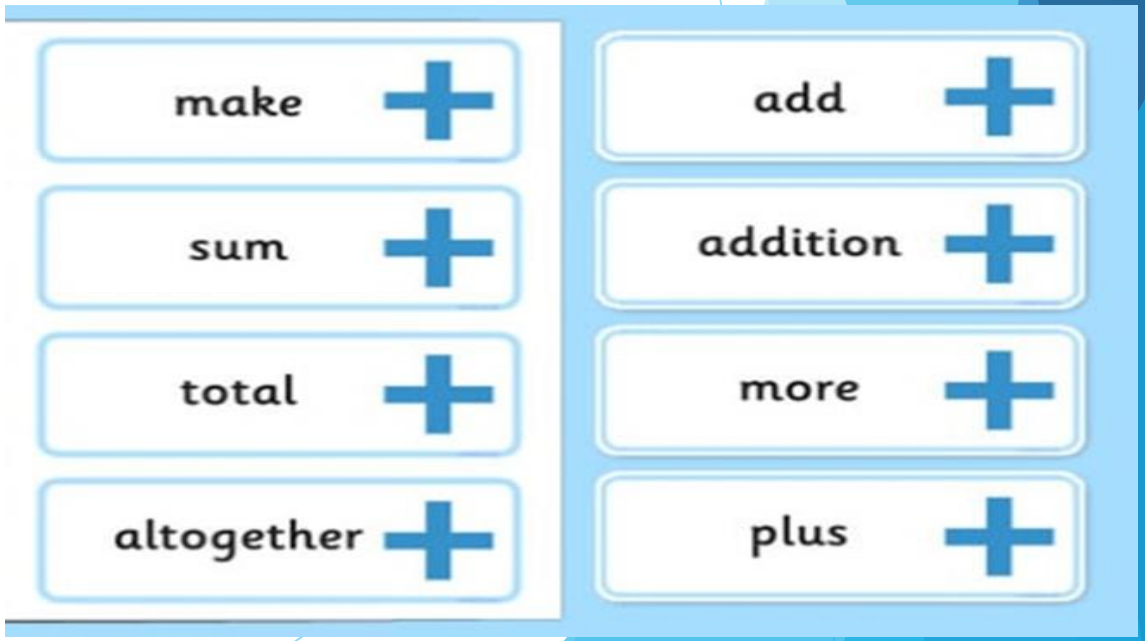
Column Method- Year 2

- *The column method is a way of calculating by placing numbers directly on top of each other. To subtract numbers, line up the tens and the ones with the big number on top. Then, subtract the ones. If the bottom number in the one's column is bigger than the top, then adjust from the tens and 'borrow' a ten before you subtract. Finally, subtract the tens. The answer is what you will get underneath..*



Mental Maths at home

- ***Calculation Word Cards***- *Using paper and pen you can make calculation word cards, which are perfect for getting children to explain their thought processes when it comes to mental maths. "What does this word mean?" they can teach you and become the teacher. Children love that!*



Mental Maths at home

- ***Role Play***- *Role-play games can help to prepare children for the events in life where they'll have to exercise their mental maths abilities. Pretending to buy something in a shop is a great example. One child will pretend to be the cashier, who will have to use their mental maths skills to count out the right change. The customer could then pretend to calculate the amount of time they have to get home. Perhaps they'll even have a bus that they need to catch!*
- ***Quick Fire Maths***- *Another fun game is to see how quickly children can answer maths questions! You can ask basic maths problems, which will need to be answered at speed. If they get a question wrong, then you get a point. Feel free to make each question harder than the last.*

What is Place Value?

Place value is arguably one of the ***most important areas*** *of the primary maths curriculum.*

Every year group has a set of objectives specifically focused on number and place value.

Place value is the value of each digit in a number:

- *For example …*
- *The 6 in 16 represents* ***6 ones*** *or otherwise known as* ***units****.*
- *The 6 in 63 represents* ***6 tens*** ***or*** ***60****.*
- *The 6 in 605 represents* ***6 hundreds*** ***or*** ***600****.*
- *It is important that children understand that while a digit can be the same, its value depends on where it is in the number.*
- *Most children learn this skill and understanding through the use of a place value grid.*

thousands	hundreds	tens	ones
4	0	7	4
4,000	000	70	4

hundreds	tens	ones
3	8	2
300	80	2

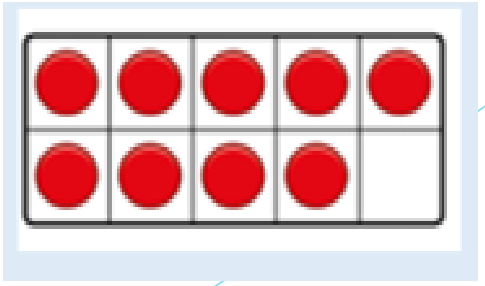
What is Place Value in EYFS?

Nursery numbers within 0-5 Reception numbers within 0-10

- ***This skill is not explicitly taught, it is learnt through activities with intended learning and small group sessions.***
- *Recite numbers in order to ten*
- *Recognises numerals to ten*
- *Knows that numbers identify how many objects there are in a set*
- *1:1 correspondence when counting objects*
- *Match numeral with quantity*
- *Recognise that anything can be counted – objects and steps up the ladder*
- *Place numbers in order*
- *Say number that is one more or one less than the number they are given.*

What is Place Value in EYFS?

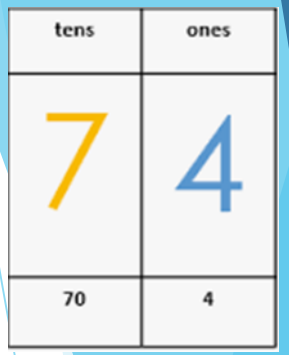
- Resources:
- Numbers
- Numicon
- Objects – cubes, bears, Christmas decorations, conkers, etc – these could be of child's personal interest/topic related
- Number track to support ordering of numbers
- Ten frames



What is Place Value in EYFS?

- In addition to resources used in Nursery & Reception. **Language plays a huge part in their understanding of number and developing their reasoning skills.**
- "Which number comes next?" "How do you know?"
- "What do you notice when you find 1 more?" – you go up the ladder
- "How do you know this is the number 5?" "How is it different to 3?"
- In nursery & Reception we use **repetition and actions** to consolidate their understanding of number.
- Showing numbers in different ways – representing numbers in claps, stomps, fingers "Show 4" "Now show me 4 with 2 hands".

What is Place Value?



Place value is arguably one of the most important areas of the primary maths curriculum.

Every year group has a set of objectives specifically focused on number and place value.

- ***Place value in Year 1***

  Count to and across 100;

  Count, read and write numbers to 100 in numerals.

Pupils may also begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.

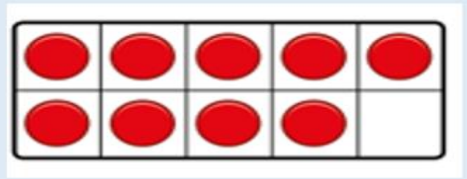
Place Value in Year 1

Partition- separates the number into smaller pieces.

This is introduced in EYFS with subitising.

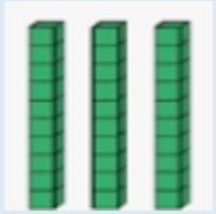
The numbers that go together to make a whole number.

tens frame



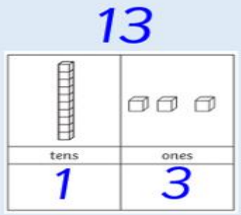
dienes

tens



ones

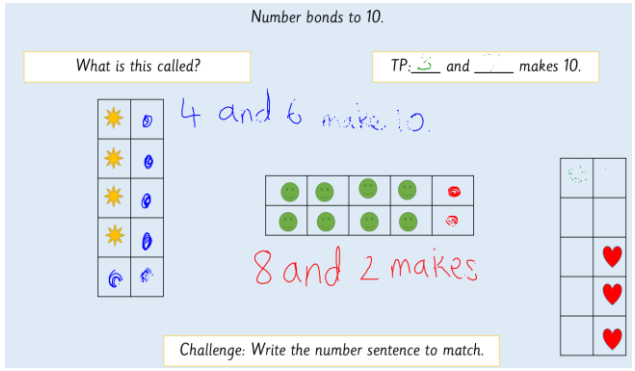
partition

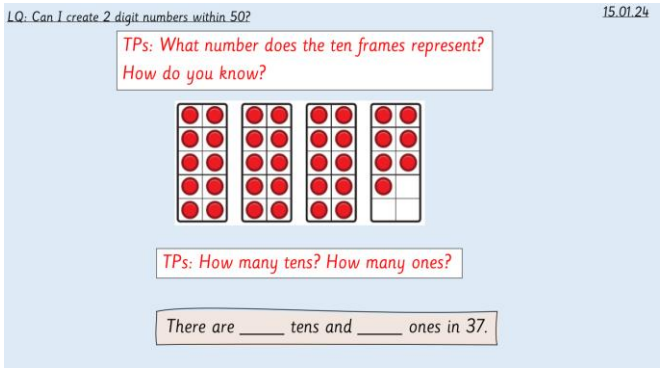


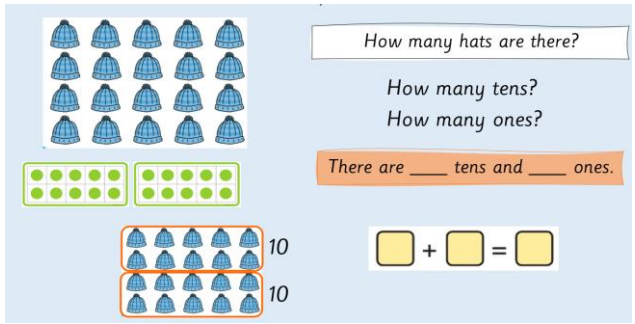
- In Year 1 when introducing place value there is a lot of emphasis on the practical aspect, having physical resources that help children partition and identify the value of each number.

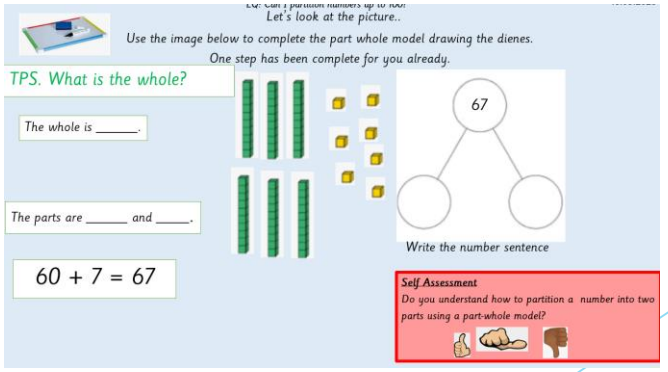
Place Value in Year 1

- *In Year 1 the children gradually develop the concept of place value by careful and considered planning.*
- *In Autumn 1 they are learn to partition numbers within 10 focusing on number bonds.*
- *In Autumn 2 they learn place value within 20.*
- *In Spring 1 they learn place value within 50.*
- *In Summer 1 they learn place value up to 100.*



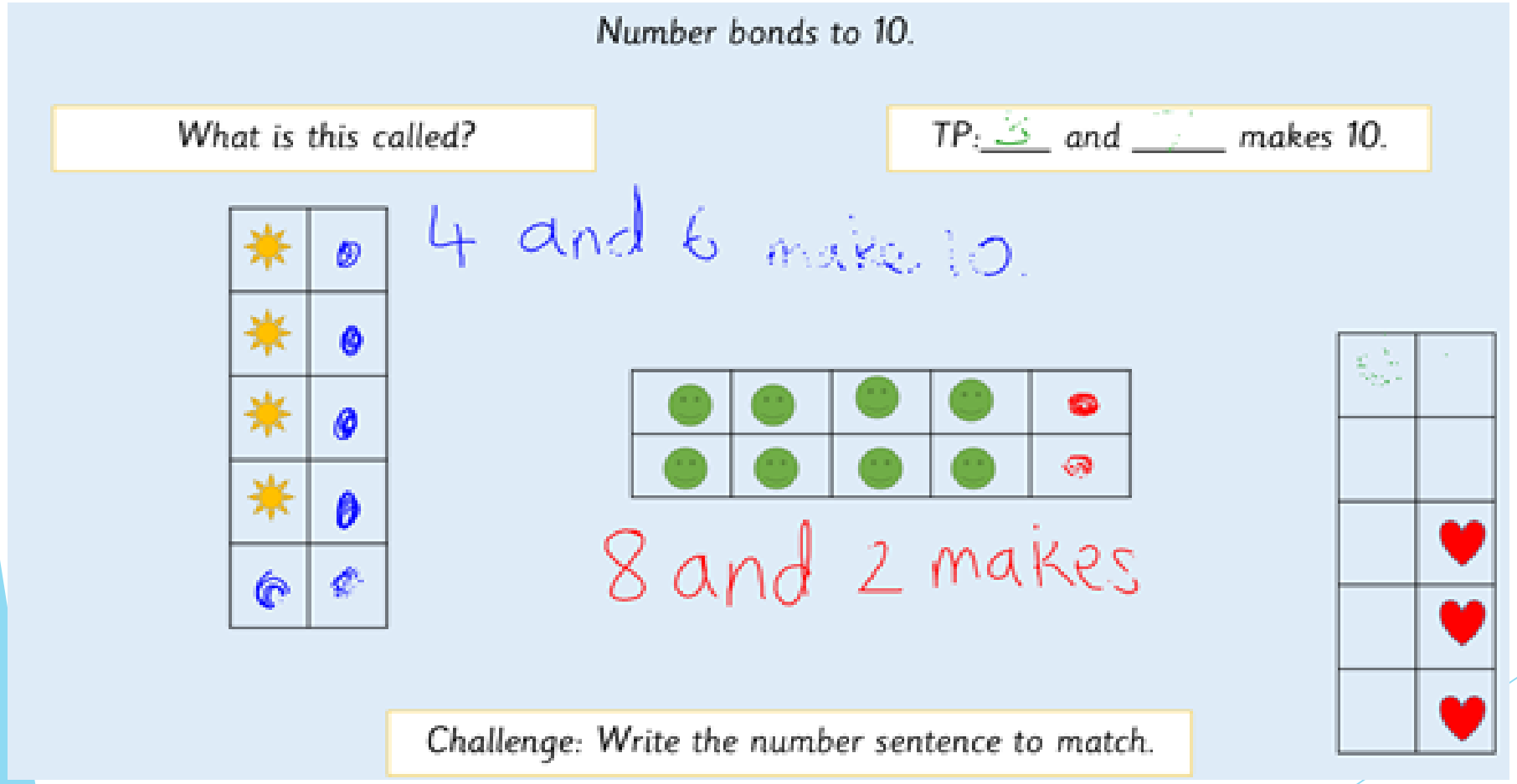






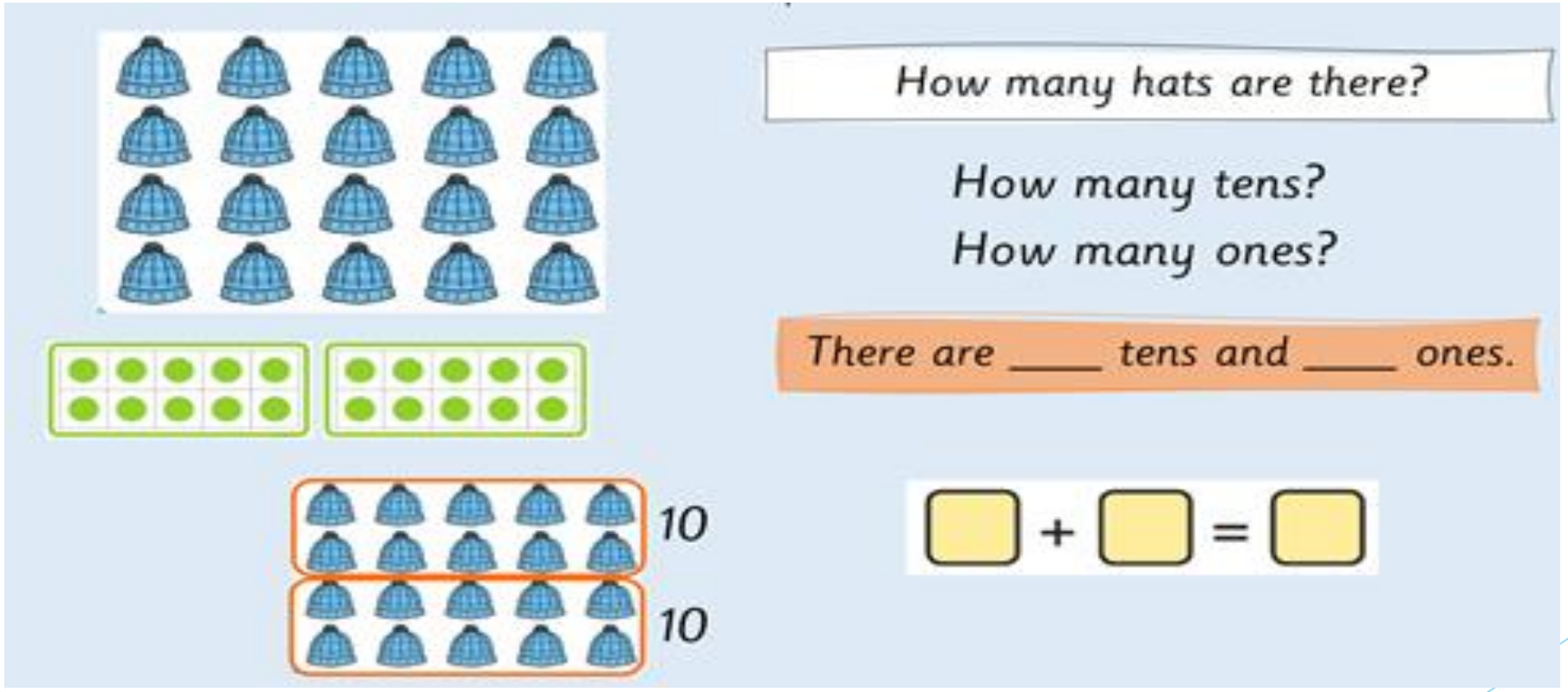
Learning sequence explained in more detail

Autumn 1



Learning sequence explained in more detail

Autumn 2

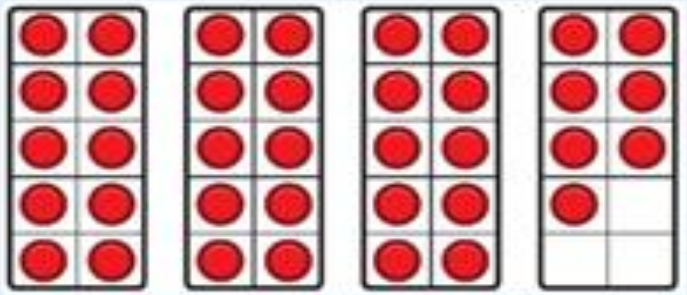


Learning sequence explained in more detail

LQ: Can I create 2 digit numbers within 50?

15.01.24

TPs: What number does the ten frames represent? How do you know?



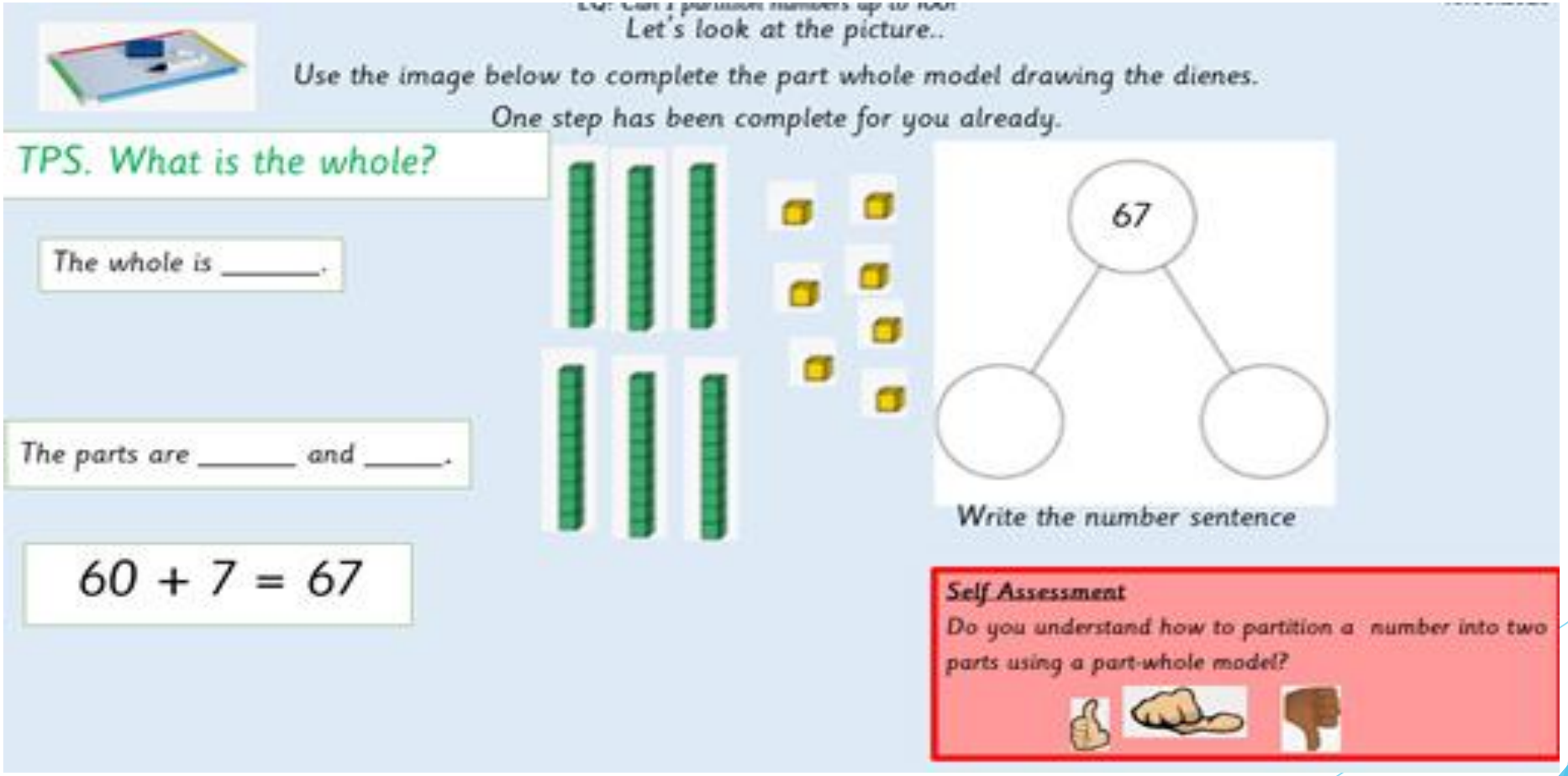
TPs: How many tens? How many ones?

There are _____ tens and _____ ones in 37.

Spring 1

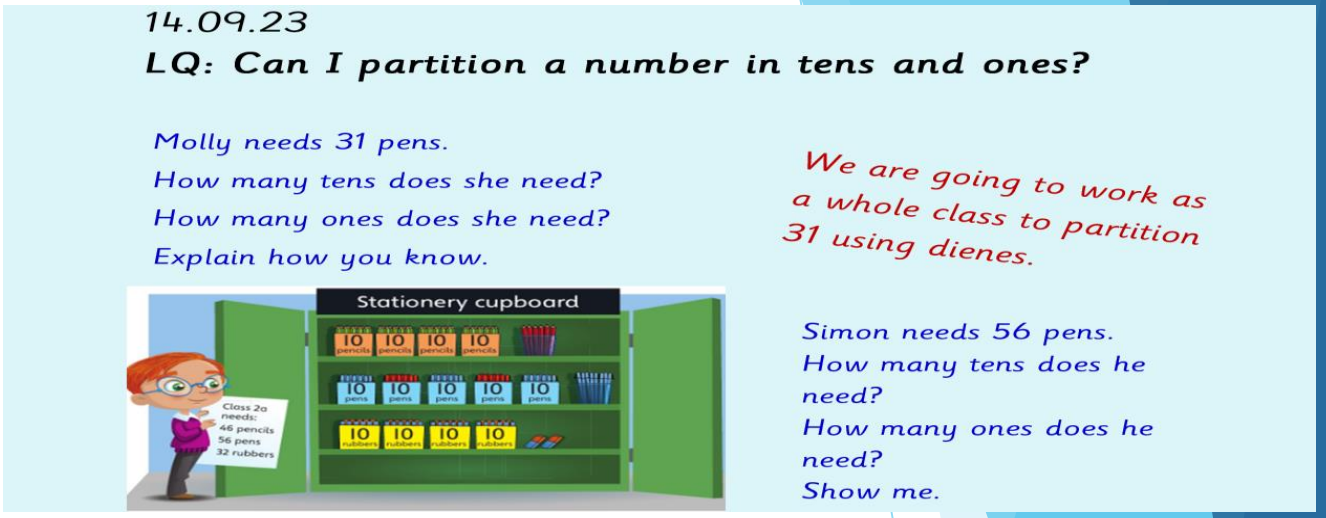
Learning sequence explained in more detail

Summer 1



Place Value in Year 2

- Place value in Year 2
- In Year 2, pupils should:



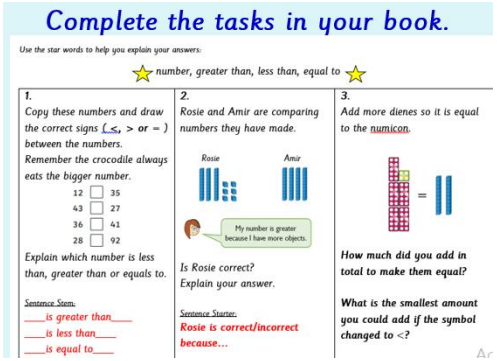
- Recognise the place value of each digit in a two-digit number (tens, ones);
- Read and write numbers to at least 100 in numerals and in words;
- Use place value and number facts to solve problems.
- By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value.

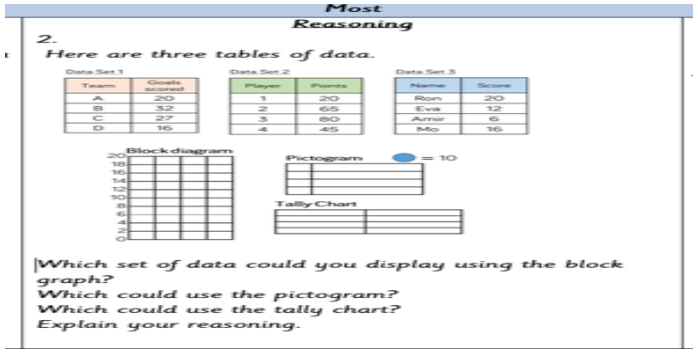
Place Value in Year 2

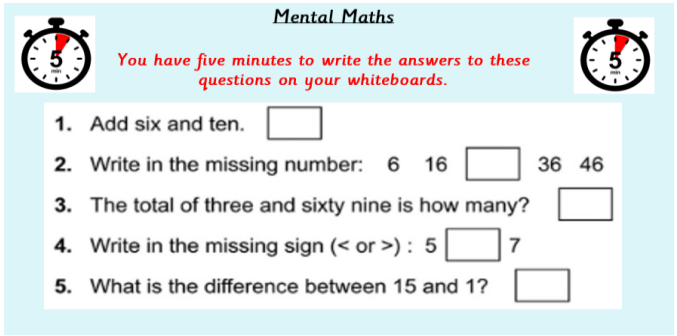
- **In Year 2 the children consolidate the concept of place value by careful and considered planning.**

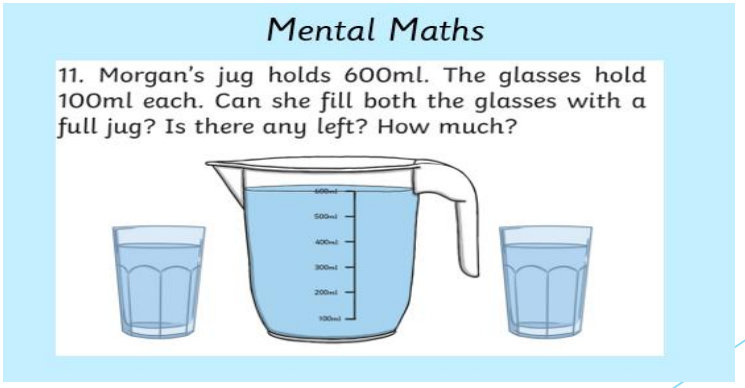
This skill is exercised in:

- *Explicit teaching of comparing numbers and amounts within 100.*
- *Problem solving and reasoning in many areas of the Maths curriculum which include tally charts and volume.*
- *Daily Mental Maths which recaps prior learning within place value and allows children to practice this skill.*







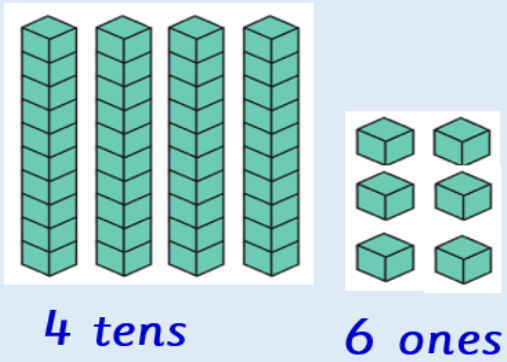


Our Maths planning is a continuum from EYFS to Year 2. This is an example of a lesson within the first half term of Year 2.

When we partition numbers, we usually separate the tens and ones.

Let's use the dienes to partition 46 into tens and ones.

46



4 tens

6 ones

Remember 4 tens makes 40 and 6 ones makes 6

Place Value in Year 2 explained in more detail.

Let's look at task 2.

Autumn 1

Use the star words to help you explain your answers:

★ number, greater than, less than, equal to ★

1.

Copy these numbers and draw the correct signs (<, > or =) between the numbers.

Remember the crocodile always eats the bigger number.

12	☐	35
43	☐	27
36	☐	41
28	☐	92

Explain which number is less than, greater than or equals to.

Sentence Stem

_____is greater than_____

_____is less than_____

_____is equal to_____

2.

Rosie and Amir are comparing numbers they have made.

Is Rosie correct?

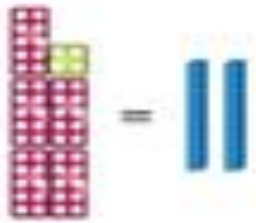
Explain your answer.

Sentence Starter

Rosie is correct/incorrect because...

3.

Add more dienes so it is equal to the numicon.



How much did you add in total to make them equal?

What is the smallest amount you could add if the symbol changed to <?

Place Value in Year 2 explained in more detail.

Let's look at this task.

Spring 1

Most

Reasoning

2.

Here are three tables of data.

Data Set 1

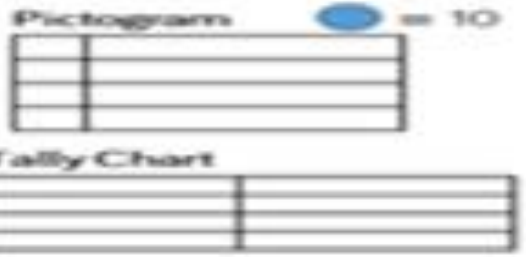
Team	Goals scored
A	20
B	32
C	27
D	16

Data Set 2

Player	Points
1	20
2	65
3	80
4	45

Data Set 3

Name	Score
Ron	20
Eva	12
Amir	6
Mo	16



Which set of data could you display using the block graph?

Which could use the pictogram?

Which could use the tally chart?

Explain your reasoning.

Place Value in Year 2 explained in more detail.

An example of our daily mental Maths

Mental Maths

You have five minutes to write the answers to these questions on your whiteboards.

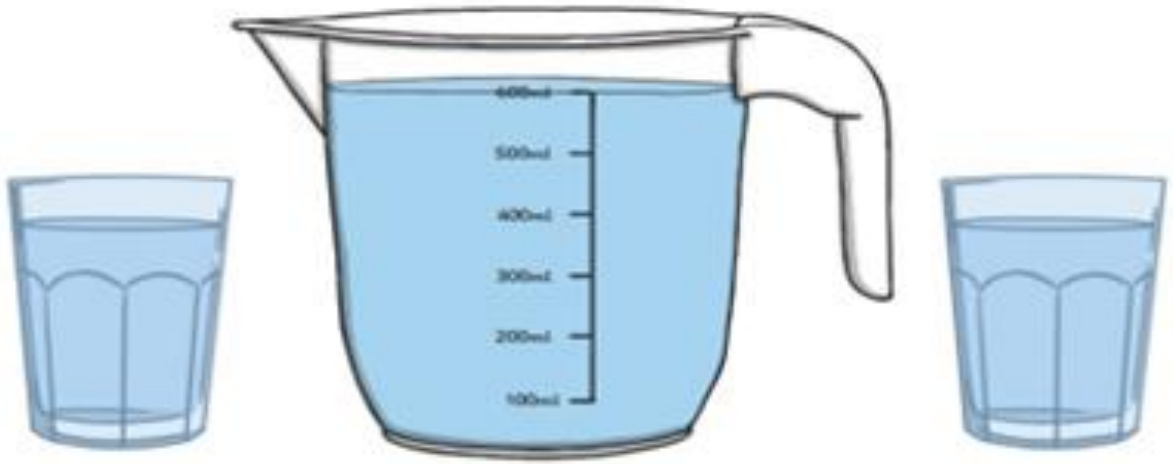
1. Add six and ten. ☐
2. Write in the missing number: 6 16 ☐ 36 46
3. The total of three and sixty nine is how many? ☐
4. Write in the missing sign (< or >) : 5 ☐ 7
5. What is the difference between 15 and 1? ☐

Place Value in Year 2 explained in more detail.

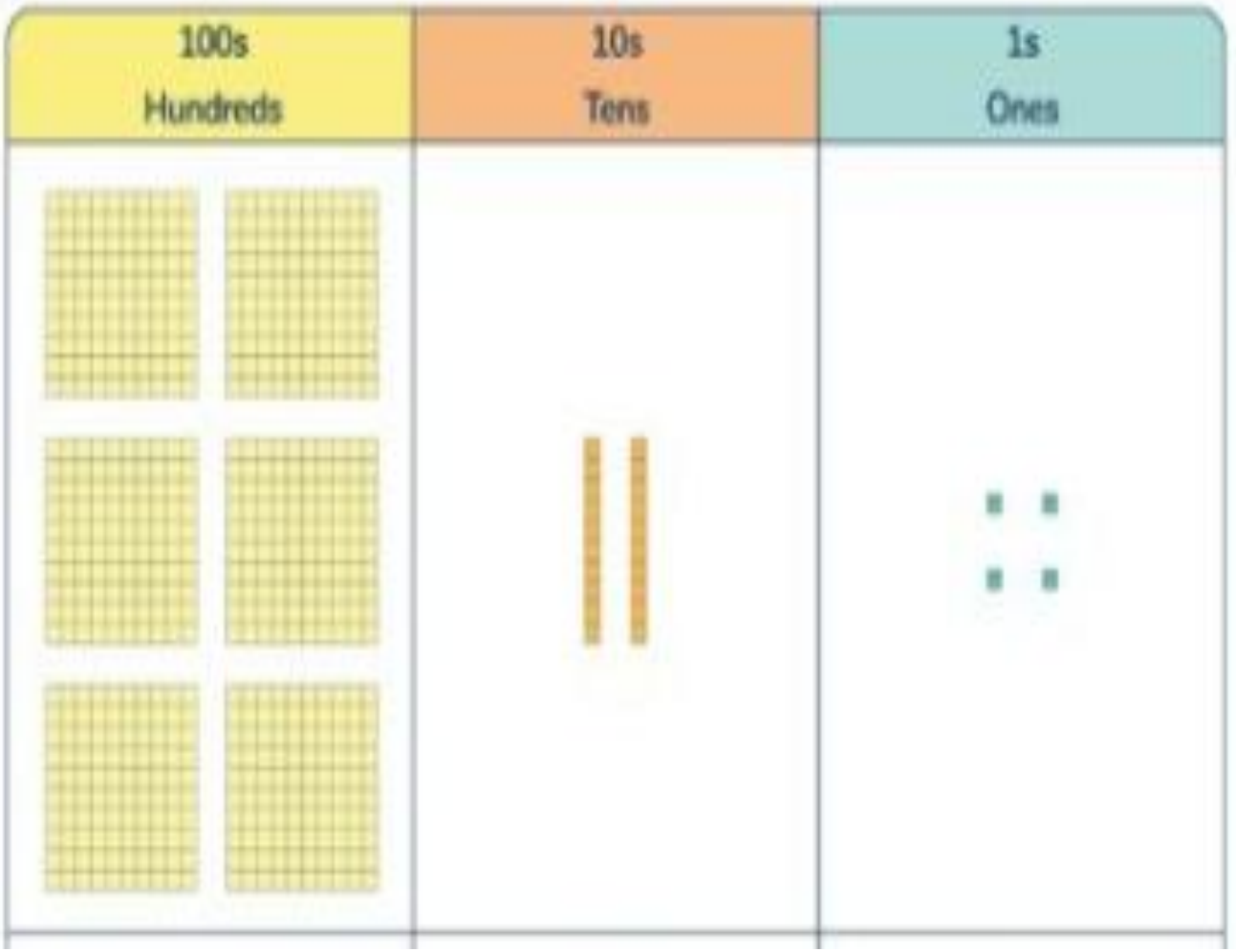
An example of our daily mental Maths

Mental Maths

11. Morgan's jug holds 600ml. The glasses hold 100ml each. Can she fill both the glasses with a full jug? Is there any left? How much?

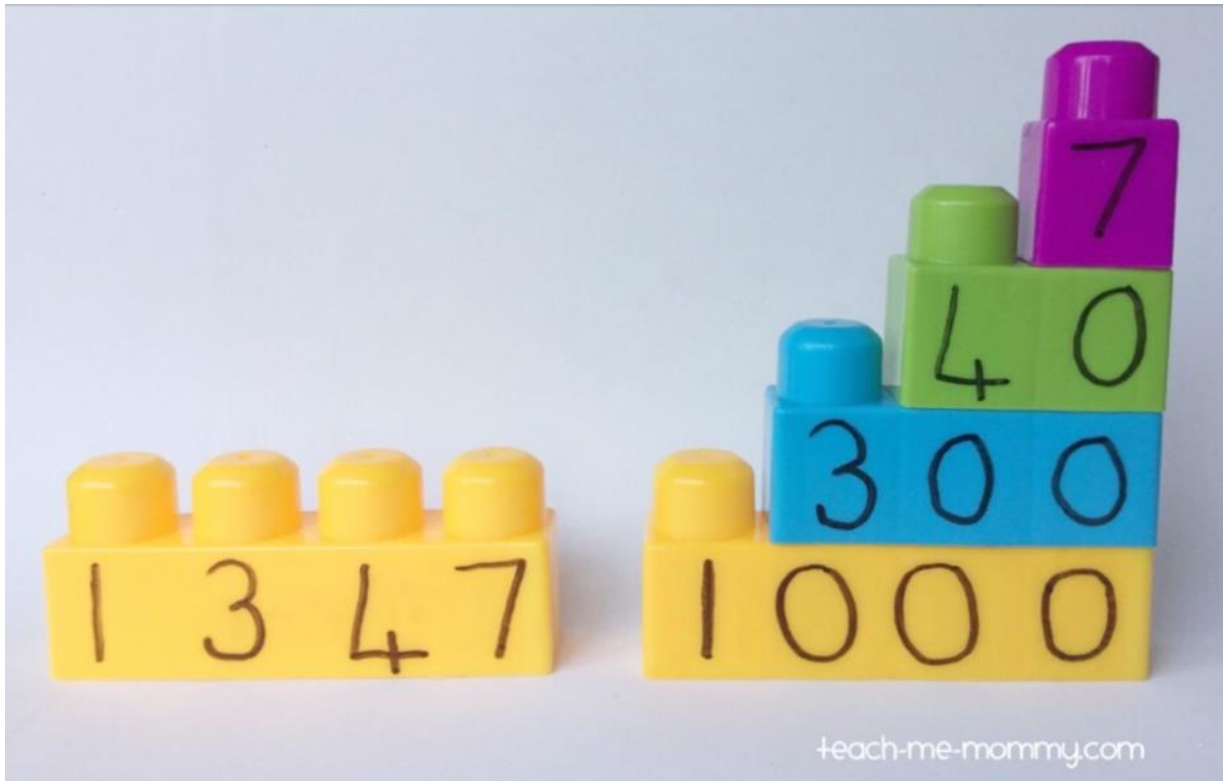


Parents- What number is displayed on the place value grid?



Teaching Place Value at home

- *Learning place value is a foundational skill children need to be successful in maths. Practicing place value at home can help them tackle whatever math challenge awaits them in the classroom.*



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Place Value Scavenger Hunt

Name:

Directions: Cut out and glue a number beside the description it matches.

0 in the ones place	10
2 in the tens place	27
4 in the hundreds place	465
5 in the tens place	59
6 in the hundreds place	600+ Stores

Teaching Place Value at home

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Thank you for coming