White Rose Maths

Autumn - Block 2

Addition & Subtraction

Overview

Small Steps

- Part-whole model
- Addition symbol
- Fact families – addition facts
- Find number bonds for numbers within 10
- Systematic methods for number bonds within 10
- Number bonds to 10
- Compare number bonds
- Addition – adding together
- Addition – adding more
- Finding a part
- Subtraction – taking away, how many left? Crossing out
- Subtraction – taking away, how many left? Introducing the subtraction symbol
- Subtraction – finding a part, breaking apart
- Fact families – the 8 facts
- Subtraction – counting back

Notes for 2020/21

The importance of early number and early understanding of mathematics cannot be underestimated. With the learning of reception children being disrupted, we've decided to put a bit more time early in Year 1 on numbers to 10, particularly around place value and the introduction to the concept of parts and wholes.

Number bonds are particularly important so ensure sufficient time is spent on these.

Overview

Small Steps

- Subtraction – finding the difference
- Comparing addition and subtraction statements $a + b > c$
- Comparing addition and subtraction statements $a + b > c + d$

Notes for 2020/21

The importance of early number and early understanding of mathematics cannot be underestimated. With the learning of reception children being disrupted, we've decided to put a bit more time early in Year 1 on numbers to 10, particularly around place value and the introduction to the concept of parts and wholes.

Number bonds are particularly important so ensure sufficient time is spent on these.

Part-whole Model

Notes and Guidance

Children need to understand that a number can be partitioned into two or more parts. This will help them with number bonds and addition.
They will be introduced to the part-whole model to show this concept clearly, and should get used to seeing it in different orientations.
Children should use and understand the language part, part, whole.

Mathematical Talk

What does whole mean?

What does part mean?

How can we represent the whole/parts?

Are the parts smaller or larger the more you partition them? Why?

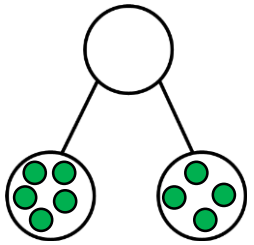
Can zero be a part?

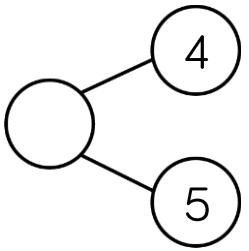
Can the parts be swapped around?

Can the whole be swapped with a part?

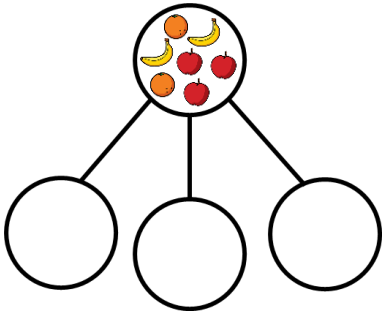
Varied Fluency

Complete the part-whole models by drawing counters and then writing the numerals.





Here are seven pieces of fruit.



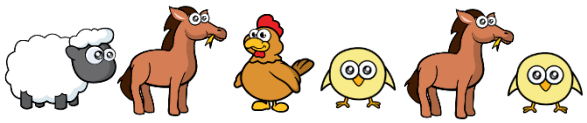
Put the fruit into a part-whole model.
Complete the sentences.
_____ is the whole.
_____ is a part, _____ is a part and _____ is a part.

Draw the part-whole model that represents the stem sentences:

- A part is 4
- A part is 3
- The whole is 7

Part-whole Model

Reasoning and Problem Solving

There are 6 animals.  How many different ways can you sort the animals? Complete a part-whole model for each way. Can you partition the animals into more than 2 groups?	Various answers. E.g. brown & not brown 4 legs & 2 legs Multiple groups could be the type of animal. Part-whole models should accurately represent children's sorting.
4 is the whole. How many **different** part-whole models can you draw to show this? Use different numbers for the parts every time. Are any the same? Why?	4 and 0, 0 and 4 1 and 3, 3 and 1 2 and 2 Children should recognise 4 and 0 and 0 and 4 being the same etc.

Work in groups of up to 8 children. Can you split yourselves into different groups? Think of different ways to group yourselves: hair colour, eye colour, gender, shoe size etc. Complete a part-whole model for each way. Can you partition into more than 2 groups?	Children may split themselves into groups in many different ways. E.g. hair colour, month of birth, shoe size, gender etc. Part-whole models should accurately represent children's sorting.

The Addition Symbol

Notes and Guidance

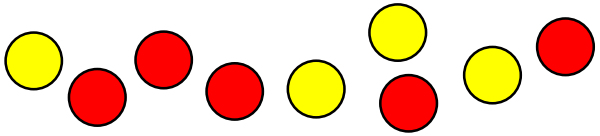
Children are introduced to the addition symbol (+) for the first time. They combine this with the 'equal to' symbol (=) to create their first number sentences e.g. $3 + 2 = 5$
At this stage, children focus on a specific order to the number sentence ($a + b = c$). They focus on the language associated with this number sentence. For example, 7 apples plus 3 apples is equal to 10 apples. First, then, now stories and bar models may help children understand the number sentences.

Mathematical Talk

How many were there at the start?
Then how many more were added?
What is the total?
What does the = mean?
Which number tells us how many we had to start?
Which number shows what has been added?
Which number represents the total?
How many green cubes could we use?
How many yellow cubes could we use?
Which part do the cubes represent?

Varied Fluency

Here are some counters.

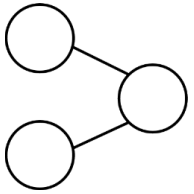


Group the counters by colour.
Fill in the gaps in the sentence and say it out loud.

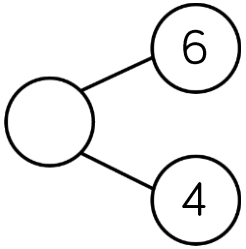
_____ red counters plus _____ yellow counters is equal to _____ counters.

Complete the part-whole model and the number sentence.

□ + □ = □



Use cubes to solve the following calculations.

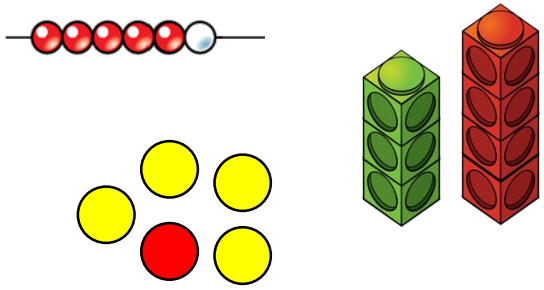


5 + 3 = □

8 + 1 = □

The Addition Symbol

Reasoning and Problem Solving



_____ + _____ = 6

Which of the images could help to complete the number sentence? Explain why.

Can you think of a number sentence for each of the other two images?

The bead string as there are 6 beads in total, 5 red and 1 white, so
5 + 1 = 6 or
1 + 5 = 6

The cubes could represent
3 + 4 = 7 or
4 + 3 = 7

The counters could represent
4 + 1 = 5 or
1 + 4 = 5

Using the numbers 0 – 9, how many ways can you fill in the boxes to make the calculation correct?
You can only use each number once.

□ + □ = □

How many different calculations are there?

What do you notice?

Examples may include:
5 + 1 = 6
3 + 4 = 7
There are 32 in total.

Children should recognise that the parts can be swapped to create a difference number sentence. There should be a discussion as to why we haven't/can't include 0 in our calculations.

Fact Families – Addition Facts

Notes and Guidance

Children build on initial number sentences by looking at addition fact families. They can see that the order of an addition sentence can be varied, and they begin to discover that addition is commutative.

E.g. $3 + 2 = 5$ $2 + 3 = 5$

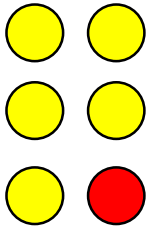
$5 = 3 + 2$ $5 = 2 + 3$

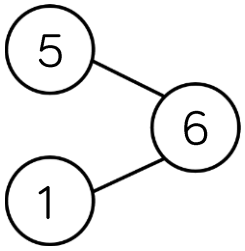
Mathematical Talk

Which number(s) represent a part?
Which number represents the whole?
Is the equals sign always at the end of a number sentence?
What's the same/different about the four addition sentences?
If two of the numbers in the part-whole model are the same, can we still write four addition sentences? Prove it.
Can we make another addition calculation using the same 3 numbers?
Can the parts change place? Can the whole change place? Why?

Varied Fluency

- Use the counters and the part-whole model to fill in the missing numbers.





$1 + \_\_ = 6$

$\_\_ + 1 = 6$

$\_\_ = \_\_ + 1$

$6 = \_\_ + \_\_$

- Complete the number sentences.

$\_\_ + \_\_ = 7$ $7 = \_\_ + \_\_$

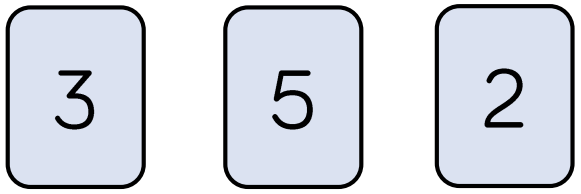
$\_\_ + \_\_ = 7$ $7 = \_\_ + \_\_$

- Use the number cards to make 4 addition sentences.

Fact Families – Addition Facts

Reasoning and Problem Solving

Eva has 3 number cards.



She has written two number sentences.

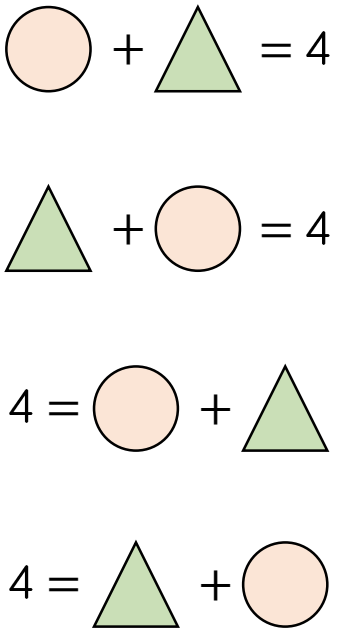
$3 + 5 = 2$ $3 = 5 + 2$

Explain what Eva has done wrong.

Correct her number sentences and complete the fact families.

Eva has placed the numbers in the order she was given them, rather than moving them to make the number sentence correct.

It should be:
$3 + 2 = 5$
$2 + 3 = 5$
$5 = 3 + 2$
$5 = 2 + 3$



What could the circle and the triangle be worth?

Possible answers:

Circle: 2
Triangle: 2

Circle: 3
Triangle: 1

Circle: 1
Triangle: 3

Circle: 0
Triangle: 4

Circle: 4
Triangle: 0

Number Bonds within 10

Notes and Guidance

Children combine their knowledge of the part-whole model and addition facts to explore number bonds within 10
Starting with the whole, children break numbers into parts and explore how many different ways a number can be partitioned.

E.g. $5 = 3 + 2$

$5 = 4 + 1$

Mathematical Talk

What is the whole?

What are the parts?

Does the whole always stay the same?

How can we partition the whole?

Do the parts stay the same or change?

If 8 is the whole, what could the parts be?

What number sentence would represent the parts we have partitioned the whole into?

Varied Fluency

- Here are 5 cubes.

Break them apart in different ways to find all the number bonds to 5
One has been done for you.

 $5 = 3 + 2$

- Use seven double sided counters. 

How many different ways to make 7 can you find?
Record your findings in number sentences.

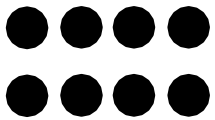
- If 9 is the whole, what could the parts be?

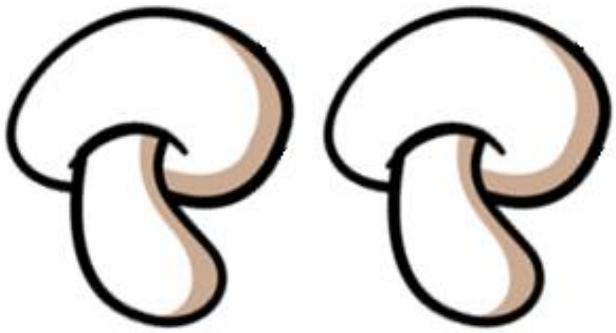
Show your findings in part-whole models.
Can you write an addition sentence for each part-whole model?

Number Bonds within 10

Reasoning and Problem Solving

All the dots have fallen off 2 toadstools.





How many different ways can you put them back on?

There are 9 different ways altogether.
8 and 0,
0 and 8,
7 and 1,
1 and 7,
6 and 2,
2 and 6,
5 and 3,
3 and 5
4 and 4

Always, Sometimes, Never

The greater the number, the more number bonds it has.

Sometimes.
Children can prove this by comparing the number bonds for a few numbers. For example, 6 has more bonds than 5, but 7 has an equal number of bonds to 5

Which number bond is the odd one out?

$3 + 4$ $5 + 2$ $6 + 1$ $3 + 5$

Explain your answer.

$3 + 5$ is the odd one out because this is a bond to 8 and the others are number bonds to 7

Systematic Number Bonds

Notes and Guidance

Children apply their partitioning skills to work systematically starting with the whole. E.g.

$7 + 0 = 7$
$6 + 1 = 7$
$5 + 2 = 7$
$4 + 3 = 7$

This is supported through the use of equipment, for example cubes, bead strings, double sided counters.

Mathematical Talk

What two numbers can be added together to make _____?

Write the number sentence to represent this number bond.

Are there any more ways to make this number bond?

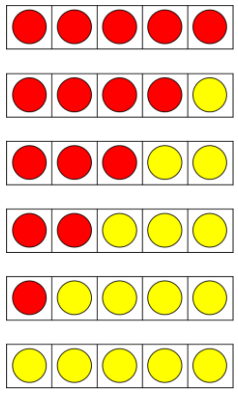
Can you see a pattern in the numbers?

What is happening to the parts each time?

Does the amount of number bonds change as the number gets bigger or smaller?

Varied Fluency

- Complete the number sentences.



$5 = 5 + 0$

$5 = 4 + 1$

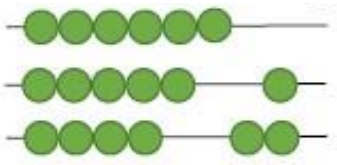
$\_ = \_ + \_$

$\_ = \_ + \_$

$\_ = \_ + \_$

$\_ = \_ + \_$

- Complete the next bead strings in the sequence.



$6 = 6 + 0$

$6 = 5 + 1$

$6 = 4 + 2$

- Can you use a ten frame to show all the number bonds to 7? Remember to be systematic.

Systematic Number Bonds

Reasoning and Problem Solving

Jack found the following number bonds to 8

3 + 5 0 + 8

1 + 7 4 + 4

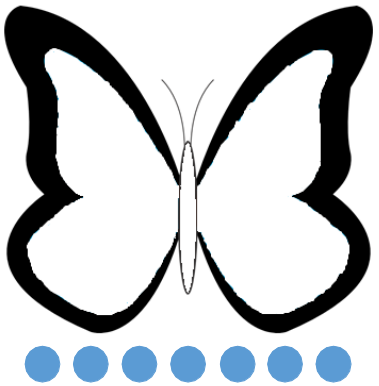
2 + 6

What order would Jack have found them in if he'd have worked systematically?

There are 9 different ways altogether.
8 and 0
0 and 8
7 and 1
1 and 7
6 and 2
2 and 6
5 and 3
3 and 5
4 and 4

A butterfly's spots have fallen off.
How many different ways can you put the spots back on?

Remember to be systematic.



Possible answers:

0 + 7 = 7

1 + 6 = 7

2 + 5 = 7

3 + 4 = 7

Children may choose to use:
7 + 0 = 7
6 + 1 = 7
5 + 2 = 7
4 + 3 = 7

Number Bonds to 10

Notes and Guidance

Focusing on the number 10, children use a variety of representations to explore number bonds to 10 systematically e.g. ten frames, bead strings, fingers.

The children should also see the number sentence alongside the representation to help further develop their conceptual understanding.

Mathematical Talk

What number have you started with?

How many more do I need to make 10?

How many number bonds can I make if 10 is the whole?

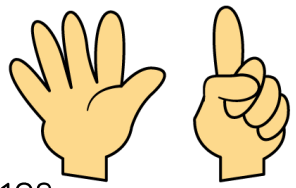
What would these bonds look like as a number sentence?

Can I order the number bonds systematically?

Do number bonds to 10 only contain one digit numbers?

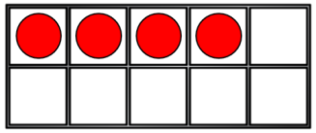
Varied Fluency

- Amir shows a number on his fingers.

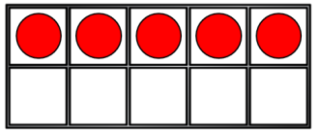


How many more fingers are needed to make 10?
What would this look like as a number sentence?

- Use the ten frames to complete the number bonds to 10



$4 + \_\_ = 10$



$5 + \_\_ = 10$

Can you make the ten frame that comes before in the sequence?
Can you make the ten frame that comes next in the sequence?

- All the ladybirds should have 10 spots. Some of the ladybirds have lost their spots. Complete the spots and write the number sentences.

Number Bonds to 10

Reasoning and Problem Solving

Always, Sometimes, Never

Number bonds to 10 have two different numbers added together.

Sometimes, there is one case where it is two of the same number.
$5 + 5 = 10$

Dora has 10 p to spend.

5 p | 6 p | 4 p

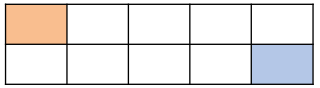
5 p | 6 p | 4 p

Which two items could she buy?
How many different ways can she do it?

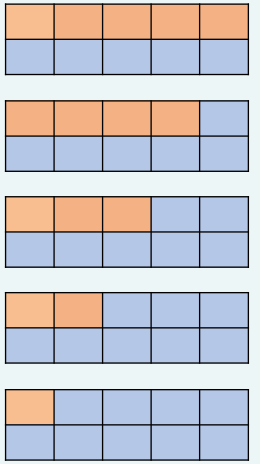
A chew bar and a muffin.
A banana and a chocolate bar.
A banana and a bottle of pop.
An apple and a chocolate bar.
An apple and a bottle of pop.

Tommy needs to colour in **all** of the boxes using two different colours.

One box of each colour has been done for him.



How many different ways can he colour the boxes?



This can also be the other way where there are 9 oranges and 1 blue, 8 oranges and 2 blues, 7 oranges and 3 blues, 6 oranges and 4 blues.

Compare Number Bonds

Notes and Guidance

Children use their knowledge of place value and number bonds to compare numbers and number sentences. They should use the correct language and symbols to compare.

E.g. 5 + 5 = 10 and 10 is greater than 8, so 5 + 5 > 8

Using concrete manipulatives will support their emerging knowledge of number bonds and can be used to develop a deeper understanding by proving why they know one number is greater than another.

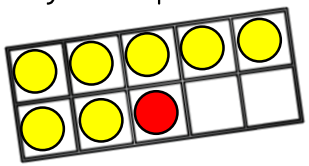
Mathematical Talk

What does compare mean?
Do we know what each side is worth?
How can we work out the total of each side?
Can you use equipment to prove that the number bonds are equal/unequal?
Do I have to solve both sides to see if the number bonds are equal?
Which calculation gives the largest answer?
Which calculation gives the smallest answer?
Which symbol can you use to show this?

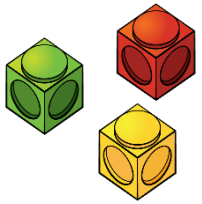
Varied Fluency

- Match the number bonds that are equal.
  Can you use ten frames and counters to prove they are equal?

4 + 5	7 + 1
2 + 6	6 + 3
4 + 2	3 + 3



- Use cubes to help you fill in <, > or = to make the statements correct.



5 + 5 ◯ 10

5 + 5 ◯ 8

2 + 5 ◯ 5 + 3

- Complete the number sentences.

5 + 3 = 4 + ___

7 + 3 > ___ + 2

Compare Number Bonds

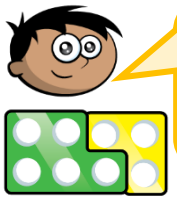
Reasoning and Problem Solving

How many different ways can you complete the number sentence?

$3 + \_\_ < 3 + \_\_$

Any combination where the number on the right is larger than the one on the left.

Amir and Whitney have both created their own number bonds.



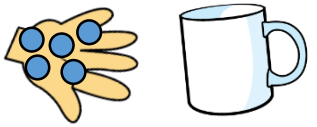
My total is greater because I have a 5 and a 3

My total is greater because I have 9 altogether.

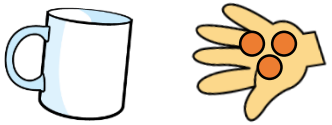
Who do you agree with?
Explain your answer.

Whitney is correct because 9 ones is greater than 3 ones and 5 ones (8 ones).

Teddy has 5 counters in his hand and some in a cup.



Tommy has 3 counters in his hand and some in a cup.



They each have the same number of counters in total.

They each have less than 10 counters.

How many counters could be in Teddy's cup?

How many counters could be in Tommy's cup?

Possible answers:
Teddy could have 1 and Tommy could have 3
Teddy could have 2 and Tommy could have 4
Teddy could have 3 and Tommy could have 5
Teddy could have 4 and Tommy could have 6

Add Together

Notes and Guidance

Children will use a part-whole model to understand the concept of addition. They should be accurately using the '+' and '=' symbols.

Children should also become familiar with language related to addition such as 'total' and 'altogether'.

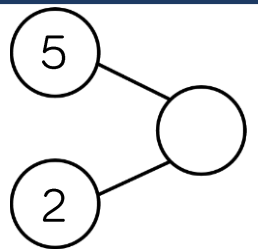
Mathematical Talk

What does each circle represent on a part-whole model?
Which of the numbers are parts?
Which of the numbers is the whole?
What else can we use to represent the cars? Can we only use counters and ten frames?
How many did you have to start with? Then what happened?
How many do you have now?
How does the ten frame help us when finding the total? Did we need two ten frames for 5 and 4? Why?
What number sentence would represent this?

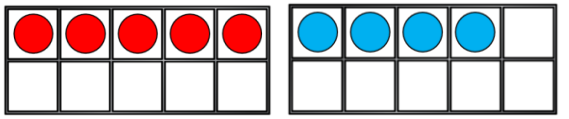
Varied Fluency

If 2 is a part and 5 is a part, what is the whole?

$\square + \square = \square$



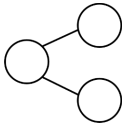
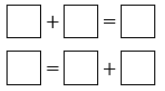
There are 5 red cars and 4 blue cars. How many cars are there altogether?



$\square + \square = \square$

$\square = \square + \square$

Complete the table to represent the owls.

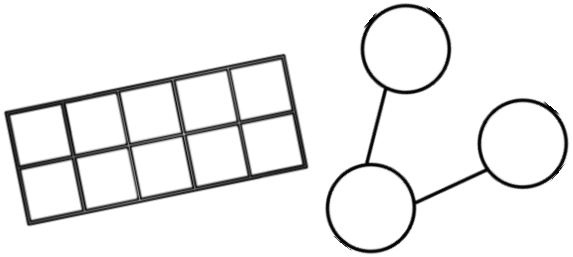
Ten Frame	Part Whole Model
	 
Sentences ___ is a part. ___ is a part. The whole is ___ .	**Make your own story**

Add Together

Reasoning and Problem Solving

There are 8 cubes.
Some are red and some are yellow.

How many different ways can you make a total of 8?



You should show your working out on a ten frame and a part-whole model.

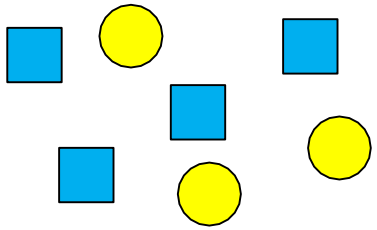
There could be:
7 red and 1 yellow,
6 red and 2 yellow,
5 red and 3 yellow,
4 red and 3 yellow,
3 red and 5 yellow,
2 red and 6 yellow
or 1 red and 7 yellow.

Children could use cubes/ten frame to show that this is incorrect as 7 and 3 would make 10 not 9

There are 9 sweets altogether.
3 have a red wrapper and 7 have a blue wrapper.
Is this correct?

Explain how you know.

Which sentence is correct?



A
5 is a part, 2 is a part and 7 is the whole.

B
4 is a part, 3 is a part and the whole is 8

C
4 is a part, 3 is a part and 7 is the whole.

What mistake has been made in the incorrect sentences?

A is wrong because the parts are not right.
B is wrong because the whole is not 8
C is correct.

Add More

Notes and Guidance

Children will move from counting all to counting on. It is important that they are exposed to calculations given to them in a different order, for example the smallest number first.

This will lead to children understanding that addition can be done in any order.

Continue to use concrete and pictorial representations to support the children's conceptual understanding.

Mathematical Talk

How many did you have to begin with?

How many more have been added?

How many do you have now?

What number sentence will represent this?

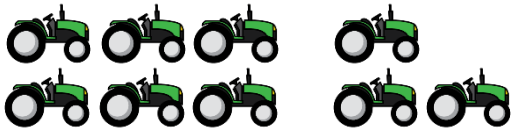
When using resources/images to find the answer, do I need to make/draw both numbers?

Do I have to start with the largest number?

Why is it more efficient to start with the larger number?

Varied Fluency

How many tractors are there in total?



6 + ___ = ___

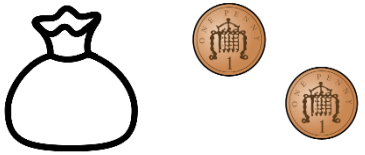
There are ___ tractors.

There are 3 aeroplanes at the airport.
5 more aeroplanes land.
How many aeroplanes are there now?

Now there are ___ aeroplanes altogether.

How could we represent this as a number sentence?

There are four pennies in a bag and I add two more.
How many pennies do I have now?



□ = □ + □

There are ___ pennies.

Add More

Reasoning and Problem Solving

True or False?

If I add 0 to a number, the number stays the same.

Can you use a number line or counters to help you explain your answer?

True because when you add 0 you are not adding any more.

Mo has used the number track to complete 4 + 2
He thinks the total is 5

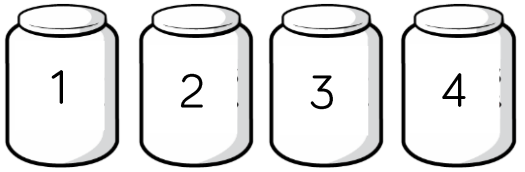
1	2	3	4	5	6	7	8

What mistake has he made?
How could Mo use the number track to find the correct answer?

He has included the starting number. To find the correct answer Mo could start counting from 5, or he could put the 4 on and then the 2 to show that the answer is 6

Sid has two bean bags.

He is throwing them into jars.
The number on the jar shows how many points he gets for a beanbag landing in that jar.
One of his beanbags lands in jar 2



What is the highest score he can get by throwing the second bean bag and adding the scores?

What is the lowest score he can get by throwing the second beanbag and adding the scores?

Explain why he can't get a total of 9

The highest score he can get is a 6 if his second beanbag landed in the 4 jar.
The lowest score he can get is a 2 if he misses the jars with his second beanbag.
He cannot get 9 because he got 2 with his first beanbag, so he would need 7 and there isn't a jar with 7 on.

Finding a Part

Notes and Guidance

Children should apply their understanding of number bonds to solve missing number problems. Building from counting on, children should start from the given part and count on to the whole, to find the missing part.

Children should also be exposed to problems with one part and the whole being the same so they understand the role of zero.

Mathematical Talk

Do you know the value of both parts?

Do you know the value of the whole?

How can we count on to find the missing part?

What number sentence would represent what we currently have/know?

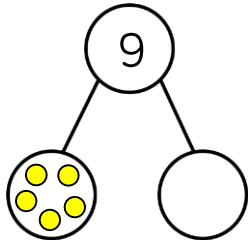
Where will the numbers from the word problem go in the part-whole model?

Where are we counting on from? How do you know?

Where are we counting to? How do you know?

Varied Fluency

- Complete the part-whole model and use it to fill in the number sentences.



□ + □ = □

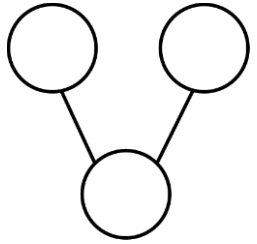
□ = □ + □

5 is a part, ___ is a part, 9 is the whole.

- There are seven cars in total. Seven of them are green. How many of them are yellow?

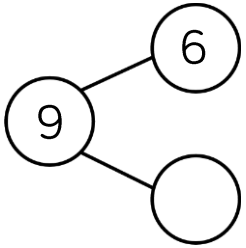
□ + □ = □

□ = □ + □



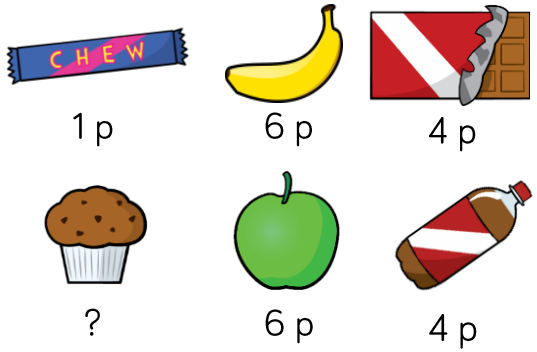
7 is a part, ___ is a part, 7 is the whole.

- Write your own story to complete the part-whole model.



Finding a Part

Reasoning and Problem Solving



Eva spends 10p on a chocolate bar and something else. What else could she have bought? Explain how you know.

Jack spent 9p on a banana and a muffin. How much is a muffin? Explain how you know.

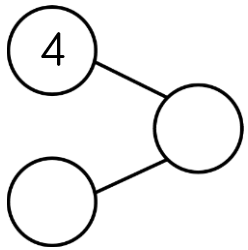
Rosie spent 6p on a chocolate bar and something for her brother. What did she buy for her brother? Explain how you know.

Eva could buy a banana or an apple as they are both 6 p and
4 p + 6 p = 10 p

A muffin costs 3 p because
6 p + 3 p = 9 p

Rosie bought her brother two chew bars because
4 p + 2 p = 6 p
and 1 chew bar is 1 p and nothing else is 2 p

Using the digits 0 – 9, how many ways can you complete the part-whole model? One of the parts always has to be 4



You can only use each digit once.

Explain why you can't use 0

What other digits can't you use and why?

It could be:

- 4, 1 and 5
- 4, 2 and 6
- 4, 3 and 7
- 4, 5 and 9

You can't use 0 because the whole would have to be 4 and then it would be repeated.
You can't use 8 because if it was a part, the whole would be too big and if it was the whole we would need another 4

How Many Left? (1)

Notes and Guidance

Children are introduced to the language of subtraction rather than the subtraction symbol being explored straight away.

'Taking away' is used in a range of real life contexts such as flying away and eating.

The use of zero is important so children know that when nothing is taken away the whole remains the same.

First, then, now … story representations can help the children understand the concept of 'how many left'.

Mathematical Talk

How many objects were there to start with?

Do we need to count all the _____ or can we count on?

What could the story be? How many did we start with?

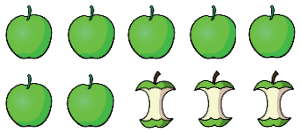
What number can we use to show that nothing has gone away/been taken away?

Varied Fluency

There were 7 birds in a tree and 3 flew away.
Complete the sentences.

At first there were ___ birds. Then ___ flew away. Now there are ___ birds in the tree.

Complete the sentences to create a story and draw a part-whole model.



At first there were ___ apples.
Then ___ were eaten.
Now there are ___ apples.

Write a story to go with the pictures and draw a part-whole model.

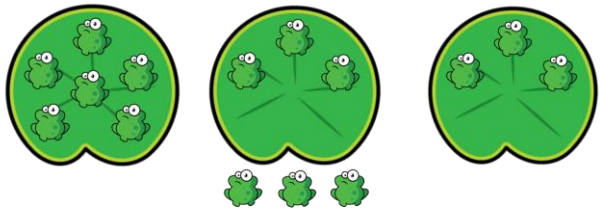
First: 

Now: 

How Many Left? (1)

Reasoning and Problem Solving

Some frogs are on a lily pad.
Three frogs jumped off and there are three frogs remaining.



Complete the sentences.

First there were ___ frogs. Then ___ frogs jumped off. Now there are ___ frogs on the lily pad.

In the 'then' picture, do the 3s show the same thing? Why not?

What if 4 jumped off, how many frogs would there have been at first?

Explain how you know.

At first there were 6 frogs.
Then 3 frogs jumped off. Now there are 3 frogs on the lily pad.

No, the 3 on the lily pad show how many are left. The 3 that are not on the lily pad show how many went away.

If 4 jumped off, the whole would have been 7 because 3 and 4 make 7

Some cakes have been eaten.

There are 2 cakes left.

How many cakes could there have been, and how many could have been eaten to be left with 2?

Explain your reasons.

There could have been 10 and 8 were eaten, 9 and 7 were eaten, 8 and 6 were eaten etc.
Children might use cubes/ten frames etc. to help them take away and finish with 2

How Many Left? (2)

Notes and Guidance

Once children understand the concept of taking away, the subtraction symbol can be introduced.

It is still important for children to create stories about the calculation and use concrete and pictorial representations so they can deepen their understanding of subtraction.

Mathematical Talk

How many counters were there at first? How many were taken away? How many are there now? Can you draw an image to show this?

What else could we use to represent the cars? How many will you start with? Why? How many will you take away? Why?

What is the same and what is different about the calculations?

Varied Fluency

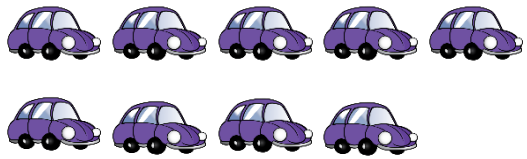
- Complete the number sentence.

7 – 2 = ___

Create a story to represent the calculation.

- Tom has 9 toy cars. He gives 5 of them away. How many does he have left?

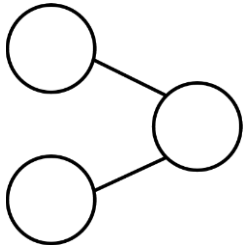
□ – □ = □



- At first there were 10 bananas. 7 of them were eaten. How many bananas are left?

Use counters/cubes to help you solve and complete:

□ – □ = □



How Many Left? (2)

Reasoning and Problem Solving

How many ways can you get an answer of 0?

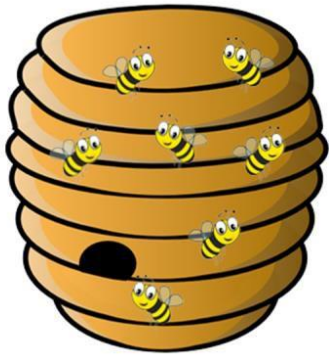
$$\square - \square = 0$$

What is the rule?

10 – 10, 9 – 9, 8 – 8 etc.

The rule is that to get zero, you have to take away the same number you started with.

How many calculations can you complete?



$$\square = 7 - \square$$

Why can't the digits 8 or 9 be used?

Children could write:
6 = 7 – 1
5 = 7 – 2 etc.

You can't use 8 or 9 because there are only 7 bees to begin with.

Subtraction – Breaking Apart

Notes and Guidance

Children continue using the subtraction symbol. Building on their understanding of finding a part, they are introduced to subtraction by partitioning.

Children break apart a number into two parts using concrete and pictorial representations to support.

Mathematical Talk

What is the whole? What are the parts?

If ___ is the whole, and ___ is a part, what is the other part?

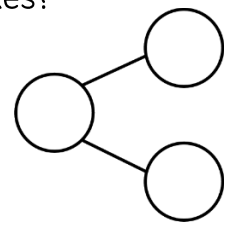
How can I use the array of party hats to convince someone else that my answer is right?

How many ways can I partition 8 into parts? Use two hoops and 8 counters to support.

Varied Fluency

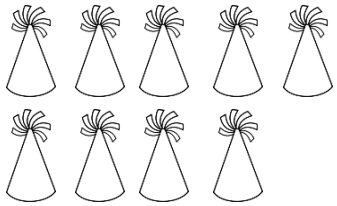
- How many ice creams do not have flakes?

6 – 2 = ___

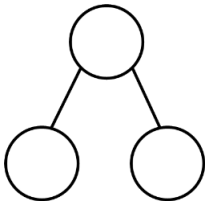


There are ___ ice creams that do not have flakes.

- There are 9 party hats altogether. 4 of them are red. The rest are blue. How many are blue?

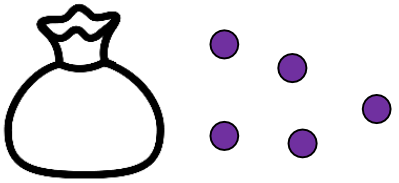


___ = 9 – 4



There are ___ blue party hats.

- In total there are 8 counters.
How many counters are there in the bag?
Show this in a part-whole model and as a calculation.



Subtraction – Breaking Apart

Reasoning and Problem Solving

Think of two questions to ask your friend about the image.

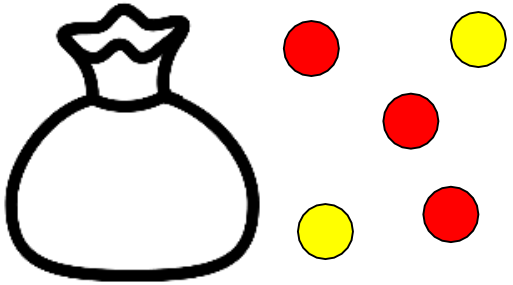
Represent your questions and answers in a part-whole model and as a number sentence.

Examples:
There are 9 sheep in total. 5 of them are outside the barn. How many sheep are inside the barn?

There are 9 sheep in total. 4 of them are inside the barn. How many sheep are outside the barn?

Etc.

There are no more than 10 counters in total.



How many counters could be in the bag?

Why can't it be six?

There could be 5, 4, 3, 2, 1 or 0

There can't be six because then there would be 11 counters in total, which is more than 10

Fact Families – 8 Facts

Notes and Guidance

Children will link addition and subtraction facts for the first time. It is important that children are able to show and understand this relationship. They should continue to be exposed to the use of zero.

Children can struggle with getting four calculations for subtraction e.g. $7 = 9 - 2$ and $2 = 9 - 7$ and should use concrete and pictorial representations to aid their understanding of this.

Mathematical Talk

How many counters were there at first? How many were taken away? How many are left? Can you draw an image to show this?

How many will you start with? Why?

How many will you take away? Why?

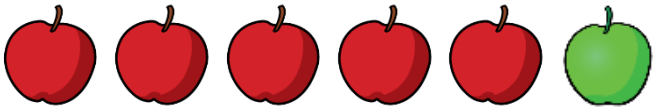
What is the same and what is different about the calculations?

Varied Fluency

Using the image, how many calculations can you create?

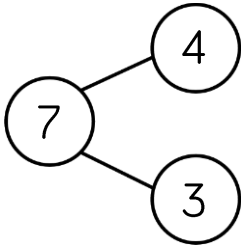
___ + ___ = ___	___ = ___ + ___
___ + ___ = ___	___ = ___ + ___
___ − ___ = ___	___ = ___ − ___
___ − ___ = ___	___ = ___ − ___

There are 6 apples. 5 of them are red and 1 is green.



Write 8 number sentences to show this.

Write 8 number sentences to match the part-whole model.



Fact Families – 8 Facts

Reasoning and Problem Solving

Explain the mistakes that have been made.

$5 + 2 = 7$ $\quad$ $7 = 5 + 2$

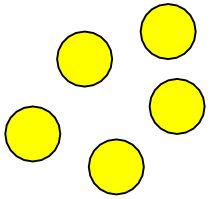
$2 + 5 = 7$ $\quad$ $7 = 2 + 5$

$7 - 2 = 5$ $\quad$ $7 = 5 - 2$

$7 - 5 = 2$ $\quad$ $7 = 2 - 5$

The bottom two on the right should be:
$5 = 7 - 2$
and
$2 = 7 - 5$

Amir has 5 counters in total.
Each of his counters are either in a bag or a cup.
How many different ways could the counters be split between the bag and the cup?



Write 8 number sentences to go with each.

Are any of the sets of number sentences the same? Why?

There could be:
5 in the cup, 0 in the bag
4 in the cup, 1 in the bag etc.

Children should notice that number sentences are the same for "4 in the cup, 1 in the bag" and "1 in the cup, 4 in the bag" etc. because the parts are the same.

Count Back

Notes and Guidance

Children count backwards to subtract. It is an important step to help children work in the abstract.

Common misconceptions could be that the children include their starting number when counting, e.g. 5 – 3; 5, 4, 3 – therefore giving the wrong answer.

It is vital to model how to count backwards by 'putting the start number in our head and counting backwards'.

Mathematical Talk

What number should we start on?

What number comes before 6?

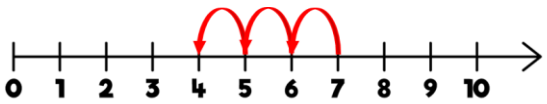
What could we say out loud to help?

Which calculations do you know match straight away?

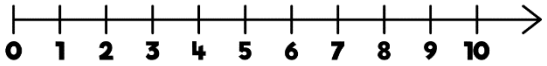
How do you know this?

Varied Fluency

Complete:

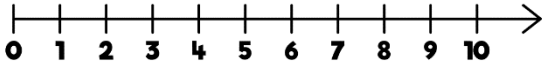


7 – 3 = ___



4 – 4 = ___

Use the number line to count back and match the calculations with the same answers.



7 – 3 = ___	6 – 6 = ___	10 – 6 = ___
5 – 0 = ___	9 – 4 = ___	4 – 4 = ___

Can you think of any other number sentences which could match them?

I count backwards from 9
How many steps does it take to get to two?
Show this in a number sentence.

Count Back

Reasoning and Problem Solving

Eva is calculating 7 – 2 and does this by counting backwards on a number line.

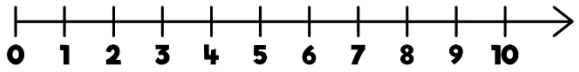
She gets an answer of 6

What mistake has she made?
What should the answer be?

Eva has included the starting number of 7 when she has been counting backwards.
The answer is 5

The answer is 2

How many ways can you get to this by counting backwards on this number line?



10 – 8,
9 – 7,
8 – 6 etc.

Game

Race to zero!

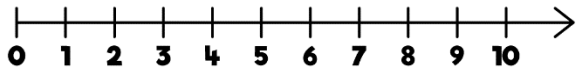
Start at 10 on a number line.

Roll a dice and subtract this amount.

The first person to land on 0 wins.

What would you like to roll? Why?

Why would you not want to roll a 1?



You might like to roll a 6 because it is a large amount to take away and so you would end up nearer to 0
You might not want to roll a 1 because it's a small amount and so it would take longer to get to 0

Find the Difference

Notes and Guidance

Children explore finding the difference as a form of subtraction. They often struggle with this concept because both parts are given.
Children could use their skills of counting back and counting on to help them find the difference. Alternatively, they can make both amounts and visually see how many more/less a number is.

Mathematical Talk

Who has more? How do you know? How many more does Whitney have?

What does difference mean? Which is most? How do you know? What strategy can we use to help us find the difference?

What image/resource can we use to show this?

How can we complete the sentences?

Varied Fluency

How many more cakes does Whitney have than Teddy?

Whitney 

Teddy 

Whitney has ___ more cakes than Teddy.

What's the difference between 10 and 6?

The difference between 10 and 6 is ___

10 – 6 = ___

Eva has 7 sweets and Mo has 3 sweets.
How many more sweets does Eva have?
How can you show this using cubes, counters or as an image?

Eva has ___ more sweets than Mo.

The difference between 7 and 3 is ___

7 – 3 = ___

Find the Difference

Reasoning and Problem Solving

Two numbers have a difference of 4

The larger number is less than 10

What could the two numbers be?

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

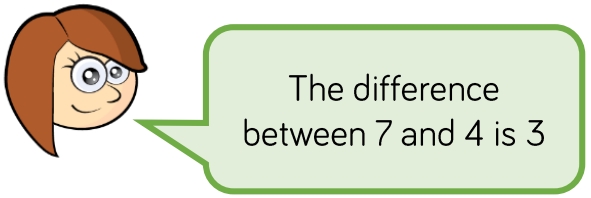
Annie says,

Write a number sentence to show why Annie is correct.

$10 - 3 = 7$
or
$7 = 10 - 3$

True or False?

Rosie says,



Can you show this in more than one way?

Children could show this by representing both numbers using cubes, bead strings, straws etc. or relating it back to counting backwards on a number line.

Compare Statements (1)

Notes and Guidance

Children use the inequality symbols to compare statements.
It is important that 'equal to' is also recapped at this stage with the correct language used.

Children should use concrete manipulatives and draw images to help them complete the statements.

Mathematical Talk

What does greater than mean?
How do we know that ___ + ___ is greater than ___?
What else can it be greater than?
What does less than mean?
How do we know that ___ + ___ is less than ___?
What else can it be less than?
What language is missing?
What steps do we need to take to help us complete the problem?

Varied Fluency

Complete the sentences.

3 + 1 is greater than ___
3 + 1 is greater than ___
3 + 1 is less than ___
3 + 1 is less than ___

One bird lays 3 eggs. Another bird lays 2 eggs.

Complete the sentence using greater than, less than or equal to.

2 plus 3 is _____ 6

Complete the number sentences.

___ + ___ is equal to 7

___ + 4 is less than 9

5 + ___ is _____ 2

Compare Statements (1)

Reasoning and Problem Solving

Would you rather have 6 sweets and 2 more sweets, or 8 sweets?

Explain your answer.
Use cubes or draw an image to help you.

I don't mind because I know that 6 and 2 is equal to 8

Using the numbers 0 – 10, how many different ways can you complete the boxes?

$\square + 7 = \square$

$\square + \square > 4$

$\square + \square < 9$

Possible answers:

$3 + 7 = 10$

$1 + 4 > 4$

$1 + 1 < 9$

What signs are missing?

$7 + 3 \bigcirc 10$

$9 \bigcirc 3 + 7$

$9 > 10 \bigcirc 3$

Explain how you know.

$7 + 3 = 10$ because I know that 7 and 3 is equal to 10

$9 < 3 + 7$ because I know that 9 is less than 10

$9 > 10 - 3$ because I know that 9 is greater than 7

Compare Statements (2)

Notes and Guidance

Once children are able to compare a simple statement to an integer (whole number), they should begin to directly compare two calculations.

They should be exposed to both addition and subtraction calculations, and the symbols <, > and =

It is important that children know what the 'equal to' sign means,
and that we can use it to show that two calculations are equal.

Mathematical Talk

What's the same? What's different?

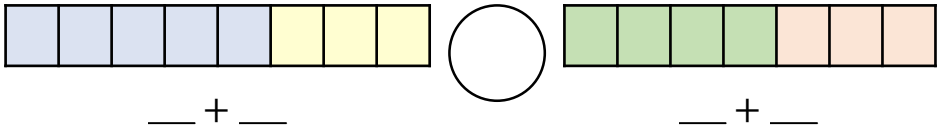
Do we always need to solve each calculation before we compare?

Which symbol should be used?

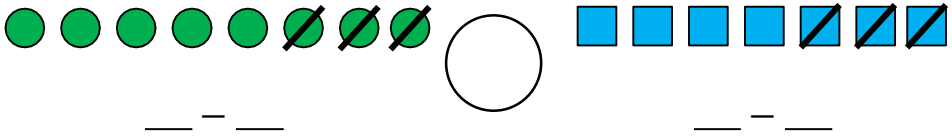
How can we prove that they are equal?

Varied Fluency

Complete using <, > or =



__ + __ ○ __ + __



__ – __ ○ __ – __

Dora has 8 sweets and eats 4 of them.
Mo has 7 sweets and eats some of them.
They now have the same number of sweets.
Can you draw a picture to represent this?
Use your picture to help you complete the number sentences.

8 – 4 ○ 7 – __

8 – 4 is equal to 7 – __

Compare Statements (2)

Reasoning and Problem Solving

Tommy says,

5 + 2 is greater than 4 + 4 because 5 is greater than 4

Is he correct? Explain why.

No because

5 + 2 = 7

4 + 4 = 8

and

7 < 8

Use the digit cards to complete the sentences.

2	3	4	5

__ + __ = __ + __

__ − __ = __ − __

__ − __ > __ − __

__ − __ > __ + __

Can you write any more number sentences using these cards?

Possible answers:

5 + 2 = 4 + 3

5 − 4 = 3 − 2

5 − 2 > 4 − 3

5 − 2 < 4 + 3

Etc.