Autumn Scheme of Learning

Year 2

#MathsEveryoneCan

2020-21

White Rose Maths

New for 2020/21

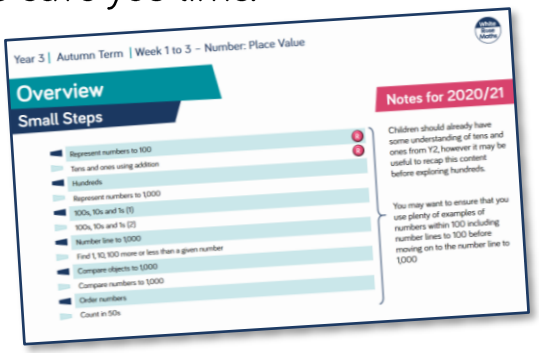
2020 will go down in history. The world has changed for all of us.

We want to do as much as we can to support children, teachers, parents and carers in these very uncertain times.

We have amended our schemes for 2020/21 to:

- ★ highlight key teaching points
- ★ recap essential content that children may have forgotten
- ★ flag any content that you might not have covered during the school closures period.

We hope these changes will add further value to the schemes and save you time.



Lesson-by-lesson overviews

We've always been reluctant to produce lesson-by-lesson overviews as every class is individual and has different needs. However, many of you have said that if blended learning becomes a key feature of school life next year, a weekly plan with linked content and videos could be really useful.

As always, we've listened! We've now produced a complete lesson-by-lesson overview for Y1 to Y9 that schools can use or adapt as they choose. Each lesson will be linked to a free-to-use home learning video, and for premium subscribers, a worksheet. This means that you can easily assign work to your class, whether they are working at home or in school.

Inevitably, this lesson-by-lesson structure won't suit everyone, but if it works for you, then please do make use of this resource as much as you wish.

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Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

For more guidance on teaching for mastery, visit the NCETM website:

https://www.ncetm.org.uk/resources/47230

Concrete - Pictorial - Abstract

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

Need some CPD to develop this approach? Visit www.whiterosemaths.com for find a course right for you.

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Supporting resources

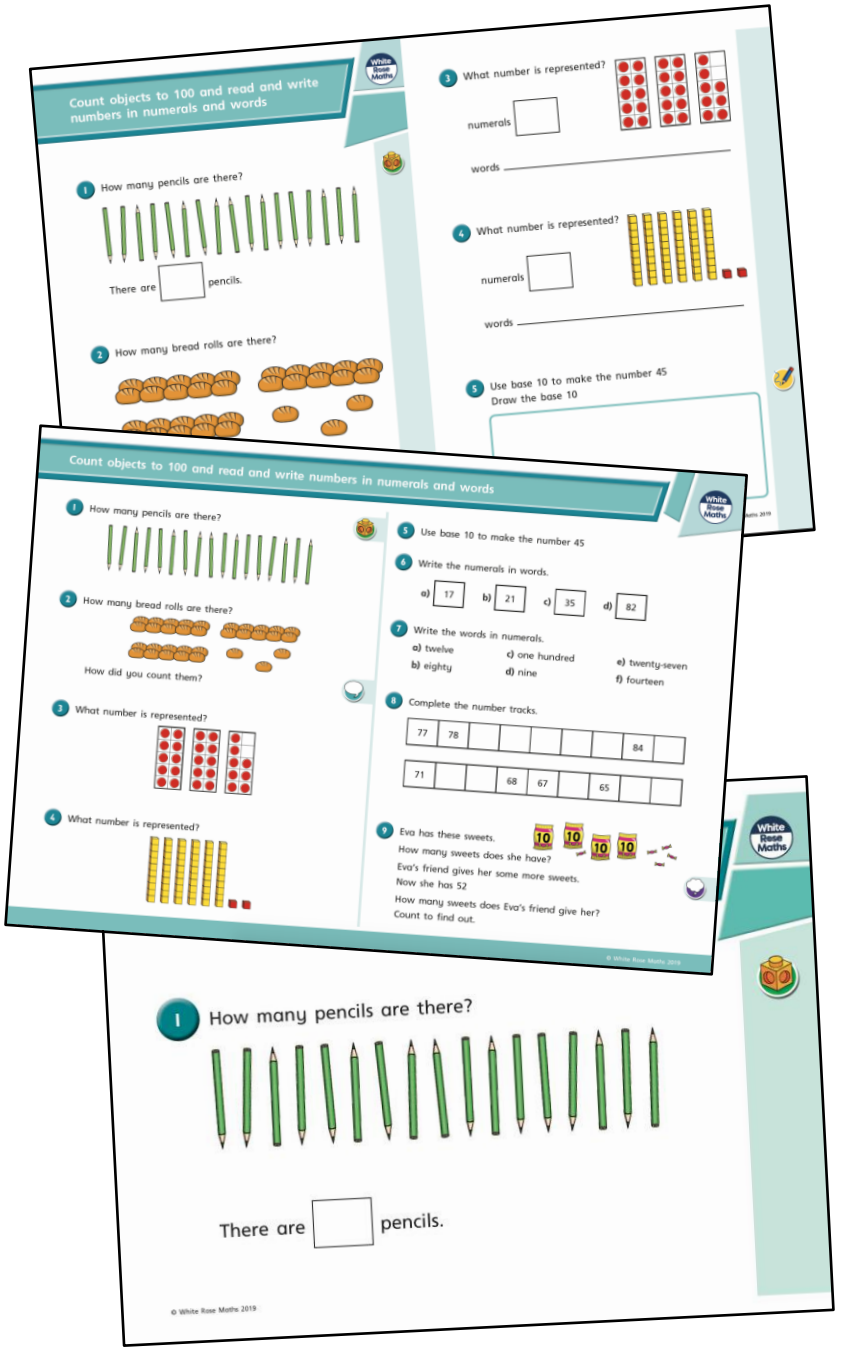
NEW for 2019-20!

We have produced supporting resources for every small step from Year 1 to Year 8.

The worksheets are provided in three different formats:

- Write on worksheet – ideal for children to use the ready made models, images and stem sentences.
- Display version – great for schools who want to cut down on photocopying.
- PowerPoint version – one question per slide. Perfect for whole class teaching or mixing questions to make your own bespoke lesson.

For more information visit our online training and resources centre resources.whiterosemaths.com or email us directly at support@whiterosemaths.com



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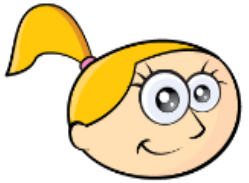
Meet the Characters

Children love to learn with characters and our team within the scheme will be sure to get them talking and reasoning about mathematical concepts and ideas. Who's your favourite?


Teddy


Rosie


Mo


Eva


Alex


Jack


Whitney


Amir


Dora


Tommy


Dexter


Ron


Annie

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	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value			Number: Addition and Subtraction					Measurement: Money		Number: Multiplication and Division	Consolidation
Spring	Number: Multiplication and Division				Statistics		Geometry: Properties of Shape		Number: Fractions			
Summer	Measurement: Movement and Turns		Geometry: Position and Direction		Consolidation and problem solving		Measurement: Time		Measurement: Mass, Capacity and Temperature			Consolidation

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Autumn - Block 1

Place Value

Overview

Small Steps

Counting forwards and backwards within 20	R
Tens and ones within 20	R
Counting forwards and backwards within 50	R
Tens and ones within 50	R
Compare numbers within 50	R
Count objects to 100 and read and write numbers in numerals and words	
Represent numbers to 100	
Tens and ones with a part-whole model	
Tens and ones using addition	
Use a place value chart	
Compare objects	
Compare numbers	
Order objects and numbers	

Notes for 2020/21

It is important to spend time early on recapping numbers within 20 and 50 before moving onto numbers to 100.

Many children will need this recap as they may not be secure in their understanding of tens and ones from Y1, even though they may have met it.

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Overview

Small Steps

- Count in 2s (R)
- Count in 5s (R)
- Count in 10s (R)
- Count in 3s

Notes for 2020/21

We have separated the step counting in 2s, 5s and 10s into three recap steps in order to explore them in more detail.

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Count & Write Numbers to 20

Notes and Guidance

Children are building on their existing knowledge of counting forwards and backwards by introducing the numbers 11-20
Children should explore the meaning of the suffix 'teen' and what this tells us about a number.
11, 12, 13 and 15 are usually difficult for children to understand because they cannot hear the single digit in the name like others e.g. sixteen – six ones and a ten.

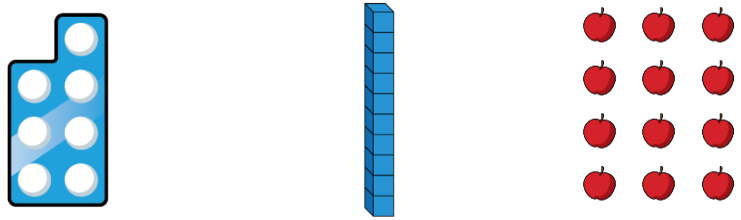
Mathematical Talk

Let's count together from 9, 10, 11, 12, 13, 14, 15, 16
What do you notice about the sounds of the numbers?
Do you notice a pattern with the numbers?
What comes after the number 10?
What do you notice about the ends of most of these numbers?
What does 'teen' tell us about a number?
How do we say this number?
How would we write _____?

Varied Fluency

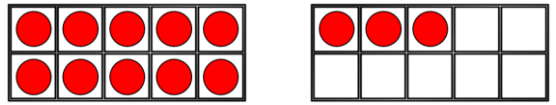
R

- Match the representations to the correct numeral.



12 7 10

- Write the number shown on the ten frames in numerals and words.



Use your own ten frames to show me the number:
Fourteen 18 Nine 16

- Fill in the missing numbers.

	15		17		

16					11

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Count & Write Numbers to 20

Reasoning and Problem Solving

R

Circle the odd one out and explain why.

11	12	13	14
15	61	17	18

61 is the odd one out. It should be 16, the digits have been swapped round.

Mr Monaghan says,



Will Mr Monaghan say 11?

Explain how you know.

Yes because 11 is between 8 and 20

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Tens and Ones

Notes and Guidance

Children learn each number from 11 to 19 has '1 ten and some more'.
They will see 10 and 20 as having just tens and no ones.
Children still need to understand that numbers can be seen in different ways. Discuss 1 ten being equal to 10 ones.
Base 10 will be introduced in this step. Children can use these concretely but also draw them as 'sticks and bricks'. A line represents 1 ten and a dot represents 1 one.

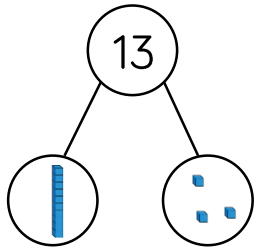
Mathematical Talk

What numbers come after 10?
Which numbers have the 'teen' sound in them?
What does the number _____ look like?
Which is greater 1 ten or 1 one? How do you know?
What does 'teen' tell us about a number?
Can you swap tens for ones?
Will it change the amount? Explain.
Do we need to count the 10 individually?
Do we need to start counting from 0 every time?
Can you describe the number _____ using tens and ones?

Varied Fluency

R

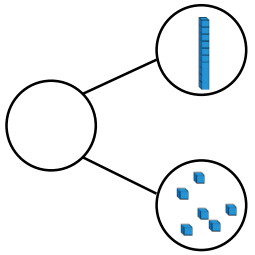
Use the part–whole model to complete the sentences.



My number is _____

One part is _____, the other part is _____

The whole is _____

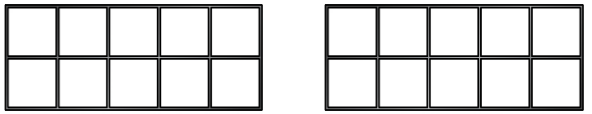


My number is _____

It has _____ tens and _____ ones.

The whole is _____

Fill in the ten frames with counters to show 14 and complete the sentence.



14 has _____ ten and _____ ones.

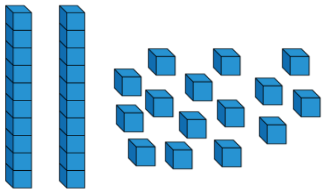
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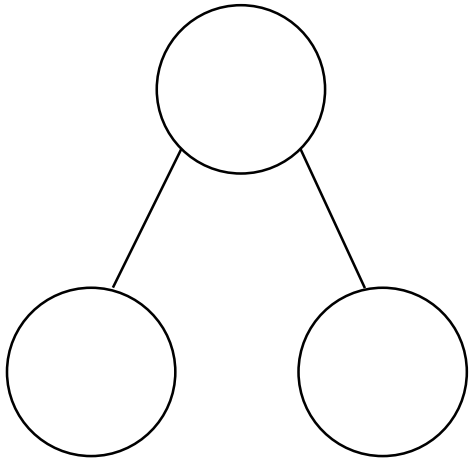
Tens and Ones

Reasoning and Problem Solving

R

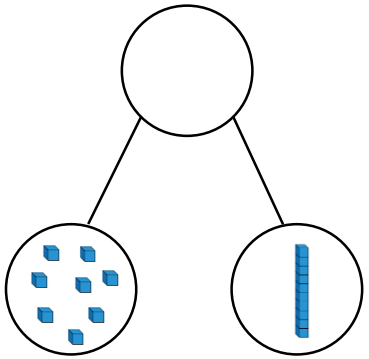
How many ways can you complete the part-whole model to show numbers up to 20, using the Base 10 equipment – you do not have to use it all.





Open ended e.g. 1 ten and 5 ones make 15

Alex makes a part-whole model.



She says:



Explain her mistake.

What is her number?

Alex has counted the ones as tens and the tens as ones.

She should say there is 1 ten and 8 ones.

Her number is 18

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Numbers to 50

Notes and Guidance

Children count forwards and backwards within 50. They use a number track to support where needed, in particular crossing the tens boundaries and with teen numbers.
Children build on previous learning of numbers to 20
They learn about grouping in 10s and their understanding of 1 ten being equal to 10 ones is reinforced.

Mathematical Talk

How can we count a larger number of objects more easily.

What happens when we get to 10? 20? 30?

___ ones make ___ ten.

How many groups of 10 can we see in the number ___ ?

Which practical equipment is best for showing groups of 10?

Varied Fluency

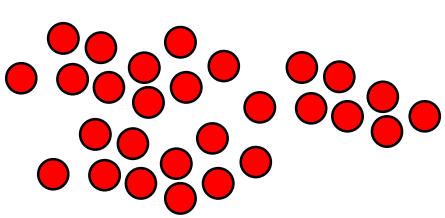
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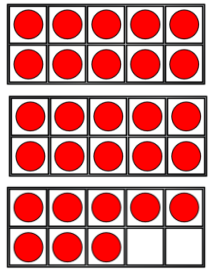
Use the number track to
- count forwards from 35 to 49
- count back from 46 to 38

35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

Can you count from ___ to ___ without a number track?

These images both show the same number of counters.
Which counters are easier to count? Why?





How many muffins are there?



40	41	42	43	44	45	46	47	48	49	50

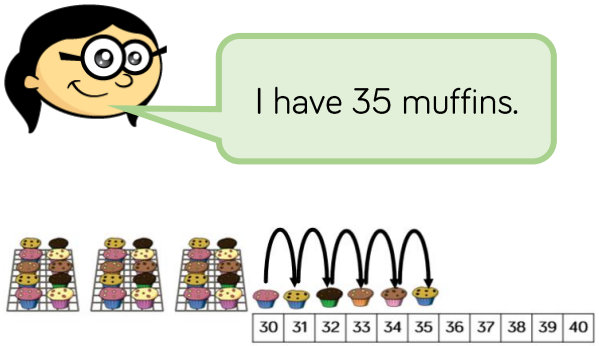
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Numbers to 50

Reasoning and Problem Solving

R

Annie counts how many muffins she has.

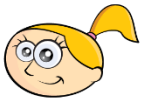


Do you agree with Annie?

Explain your answer.

Possible answer:
I do not agree with Annie because she has counted 30 twice. There should be 36 muffins.

Eva is counting from 38 to 24



Will she say the number 39?
Will she say the number 29?
Will she say the number 19?

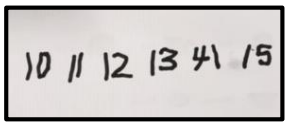
Explain how you know.

Eva will not say 39 or 19 because they are not between 38 and 24
She will say 29
Children could show this on a number track.

Ron and Whitney are counting.
Ron says:



Whitney writes:





Can you spot their mistakes?

Ron has started counting up after 40 when he should have continued counting back.
Whitney has also written 41 instead of 14. She has reversed her digits.

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Tens and Ones

Notes and Guidance

Children use practical equipment to represent numbers to 50 They continue to build their understanding that ten ones can be grouped into one ten. They need to practice grouping equipment into tens themselves (straws, cubes, lolly sticks, 10 frames) before introducing ready made tens or place value counters.

It is important that children understand how a number is made up of tens and ones, e.g. 34 = 3 tens and 4 ones.

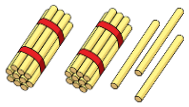
Mathematical Talk

How many have we got? How can we make them easier to count?
How many tens are there?
How many ones are there?
I have ___ tens and ___ ones. What number does that make?
How do we record this number in words?

Varied Fluency

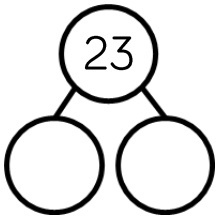
R

- Count out 23 straws. How many bundles of 10 can you make?

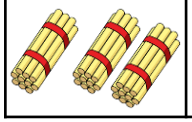
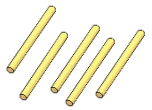


There are ___ tens and ___ ones.

___ tens + ___ ones = 23

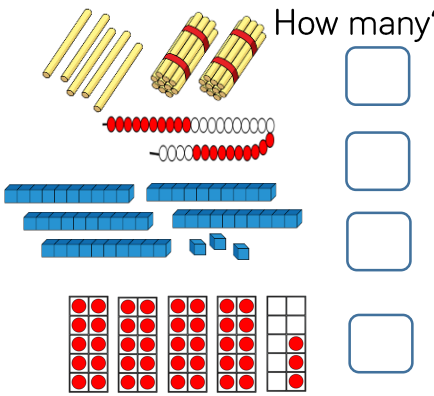


- What number is represented in the grid?

Tens	Ones
	

There are ___ tens and ___ ones.
___ tens + ___ ones = ___

- Match the pictures and words.



- Four tens and three ones
- Two tens and five ones
- Three tens and four ones
- Three ones and five tens

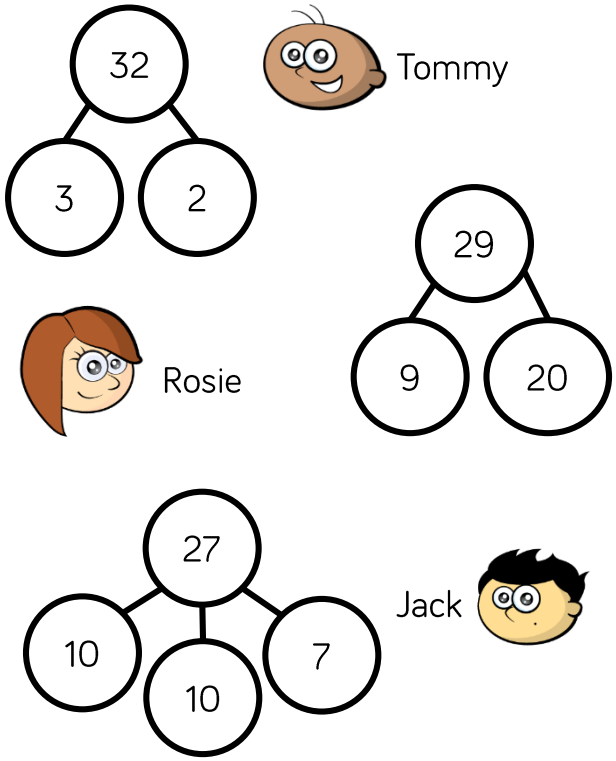
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Tens and Ones

Reasoning and Problem Solving

R

The children are completing the part whole models.



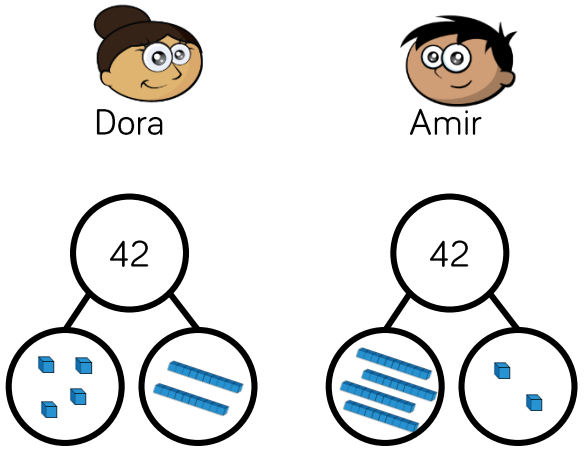
Are they correct?
Explain why.

Tommy is wrong. He has wrote 3 which should be 30 or 3 tens.

Rosie is correct – she has just recorded the ones first.

Jack is correct.
10 + 10 = 20
Two tens is the same as twenty.

Dora and Amir both try to build the same number.



Who is correct?

Can you explain the mistake that has been made?

Amir is correct.

Dora has got mixed up with tens and ones and shown 4 ones and 2 tens (24).

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Compare Numbers within 50

Notes and Guidance

Building on previous learning of comparing practical objects within 50, children now compare two numbers within 50 using the inequality symbols.

Children continue to use the language 'more than', 'less than' and 'equal to' alongside the correct symbols to compare numbers.

Mathematical Talk

Which number is more? Which is less?

What could we use to represent the numbers?

What do <, > and = mean?

How do you know you have more or less?

What could you use to help you compare?

Varied Fluency

R

Use the number track to compare the two numbers using words and inequality symbols.

19	20	21	23	24	25	26	27	28	29

21 is _____ than 26

26 is _____ than 21

21 ○ 26 26 ○ 21

29	30	31	32	33	34	35	36	37	38

□ is more than □

□ is less than □

□ > □ □ < □

Use the 1-50 grid to compare the numbers.

12 ○ 21

38 ○ nineteen

40 ○ 39 + 1

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

Use a number line or 1-50 grid to compare:

fifteen ○ 50

28 ○ 29

48 ○ 39

2 tens < □

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Compare Numbers within 50

Reasoning and Problem Solving

R

Teddy is comparing two numbers.



My number is larger than 19 but not one more than 19

23 > ☐

What could Teddy's number be?

What can't it be?

Teddy's number could be 21 or 22
It can't be 20 as this is one more than 19



Dora compares the two values.

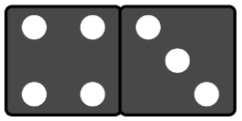
23 < 3 tens and 3 ones

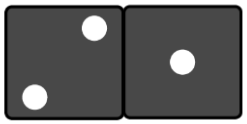
Change one thing in the values so they are equal.

Dora could change 23 = 2 tens and 3 ones or 33 = 3 tens and 3 ones.

Pick two dominoes to represent two two-digit numbers.
For example,

43 21





Then compare them using <, > or =
43 > 21 21 < 43
Explain how you know.

Children could do this with a partner.

Possible response:
43 is larger than 21 as it has more tens.

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Count Objects to 100

Notes and Guidance

To build on skills learned in Year 1, children need to be able to count objects to 100 in words and represent these numbers in numerals.

Problems should be presented in a variety of ways e.g. numerals, words and images. Variation should challenge children by providing them with missing numbers which are non-consecutive.

Mathematical Talk

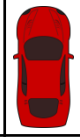
How can you count the cars?
Do you have a strategy?
What is one more/one less?

Which is the largest number?
Which number is tricky to write in words?

Which numbers sound similar?
How are 17 and 70 different? Can you show me?

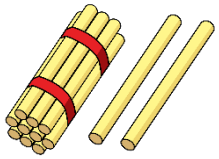
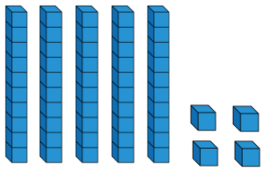
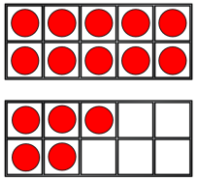
Varied Fluency

Count and write the number of cars in the car park.

one		three	four			seven	eight		ten	eleven	
											

There are _____ cars in the car park.

What numbers are represented below?
Write your answer in numerals and words.

Match the numerals to the words.

17	48	38	70

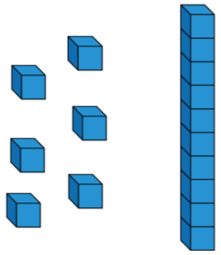
thirty-eight	seventy	forty-eight	seventeen

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Count Objects to 100

Reasoning and Problem Solving

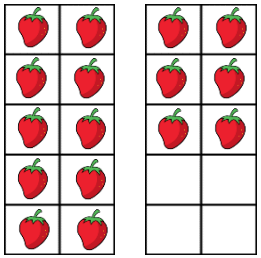
Jack says he has 61
Is he correct?

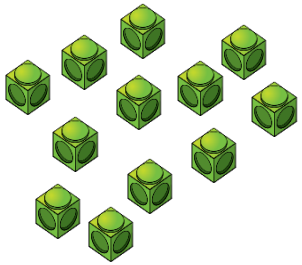


Explain your reasoning.

Jack is incorrect.
He has 16 not 61

Here are two sets of objects.

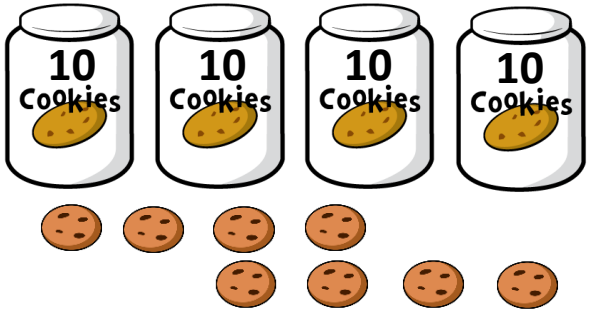




Which are easier to count?
Explain your answer.

The strawberries are easier to count because they are set out on ten frames.

Each jar contains 10 cookies.



How many cookies are there altogether?

Write your answer in numerals and words.

What strategy did you use?

Did your partner use a different method?

What is the best strategy to use?

There are 48 (forty-eight) cookies altogether.

Children may count in 10s and 1s or know that there are 4 tens which are equal to 40 and then count on 8 more.

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Represent Numbers to 100

Notes and Guidance

Children need to be able to represent numbers to 100 using a range of concrete materials, such as bead strings, straws, Base 10 equipment etc.

Children should also be able to state how a number is made up. For example, they can express 42 as 4 tens and 2 ones or as 42 ones.

Mathematical Talk

How have the beads been grouped? How does this help you count?

Can you show me the tens/ones in the number?

Which resource do you prefer to use for larger numbers? Which is quickest? Which would take a long time?

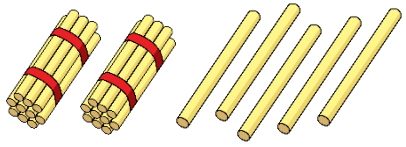
Varied Fluency

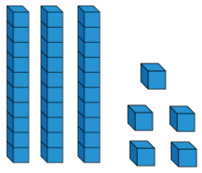
- Here is part of a bead string.



Complete the sentences.
There are _____tens and _____ones.
The number is _____.
Represent 45 on a bead string and complete the same sentence stems.

- Match the number to the correct representation.







One ten and five ones

Thirty-five

25

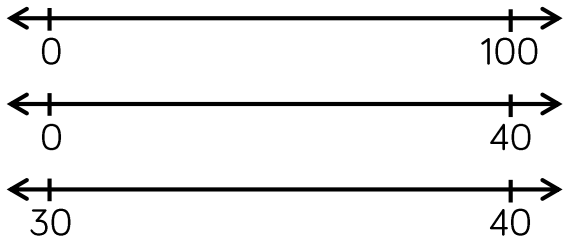
- Represent 67 in **three different** ways.

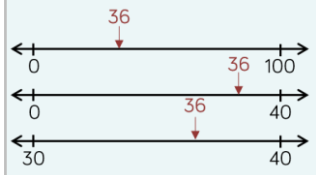
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Represent Numbers to 100

Reasoning and Problem Solving

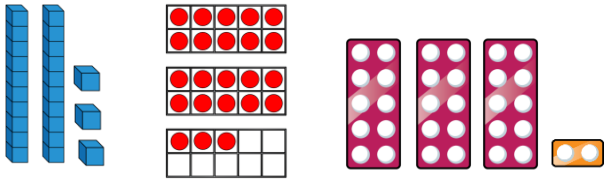
Where would 36 go on each of the number lines?





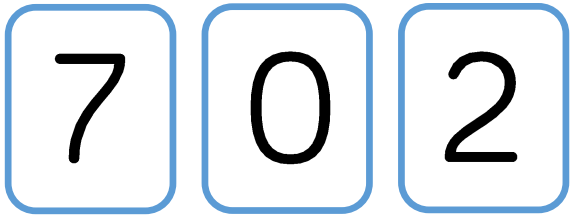
One of these images **does not** show 23
Can you explain the mistake?

A B C



C does not show 23, it shows 32
They have reversed the tens and ones.

How many two digit numbers can you make using the digit cards?



70, 20, 72, 27

What is the largest number?
Prove it by using concrete resources.

The largest number is 72

What is the smallest number?
Prove it by using concrete resources.

The smallest number is 20

Why can't the 0 be used as a tens number?

Because it would make a 1 digit number.

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Tens and Ones (1)

Notes and Guidance

Children should have an understanding of what each digit represents when partitioning a number.

It is important that children can partition numbers in a variety of ways, not just as tens and ones. For example, 58 is made up of 5 tens and 8 ones or 4 tens and 18 ones, or 2 tens and 38 ones, etc.

Mathematical Talk

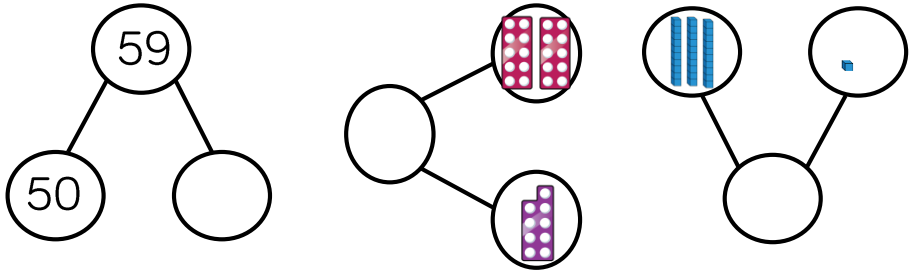
Which part do we know? How can we use the whole and part to work out the missing part?

Can you use concrete resources/draw something to help you partition?

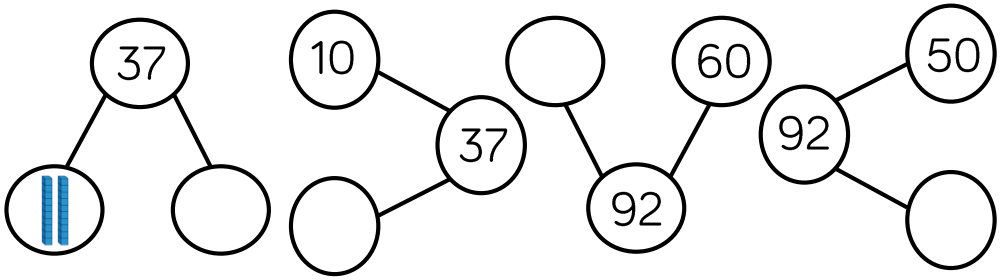
How can you rearrange the counters to help you count the lemon and strawberry cupcakes?

Varied Fluency

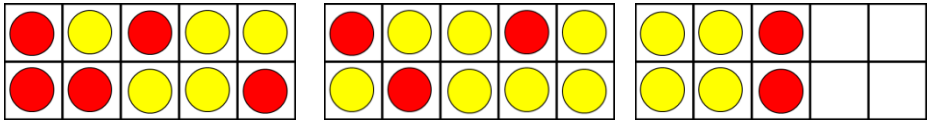
- Complete the part-whole models.



- Complete the part-whole models.



- The ten frames represent lemon and strawberry cupcakes.
Draw a part-whole model to show how many cupcakes there are altogether.

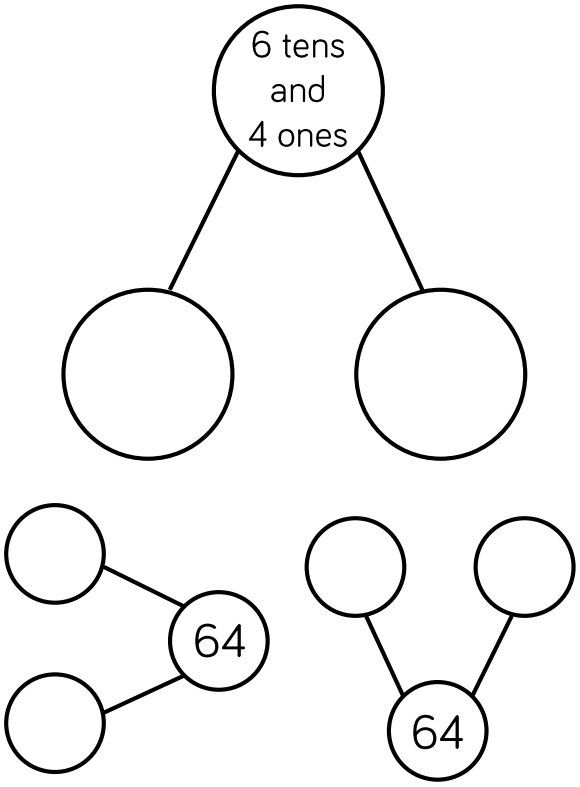


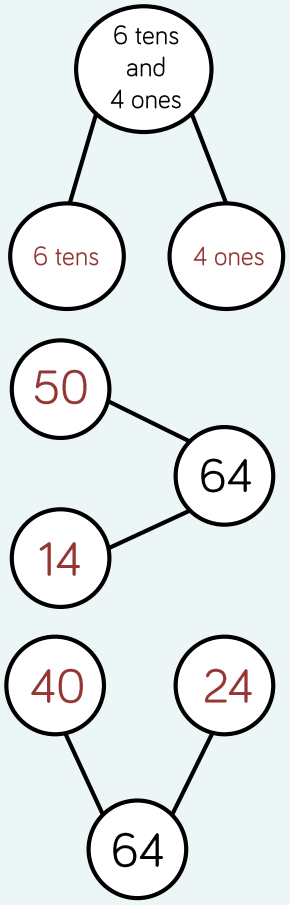
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Tens and Ones (1)

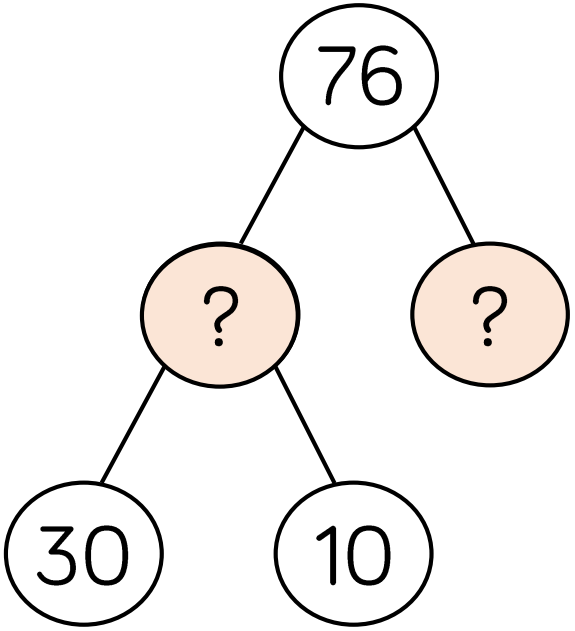
Reasoning and Problem Solving

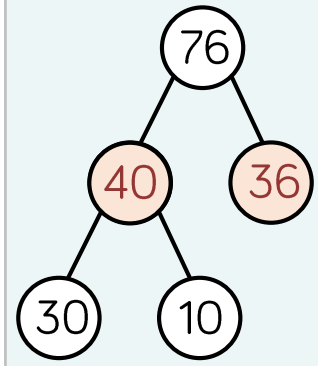
Complete each part-whole model in a **different** way.





Complete the extended part-whole model.





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Tens and Ones (2)

Notes and Guidance

Children continue to use a part-whole model to explore how tens and ones can be partitioned and recombined to make a total.
Children will see numbers partitioned in different ways. For example, 39 written as 20 + 19
This small step will focus on using the addition symbol to express numbers to 100. For example, 73 can be written as 70 + 3 = 73

Mathematical Talk

What clues are there in the calculations? Can we look at the tens number or the ones number to help us?

What number completes the part-whole model?

What is the same/different about the calculations?

What are the key bits of information? Can you draw a diagram to help you?

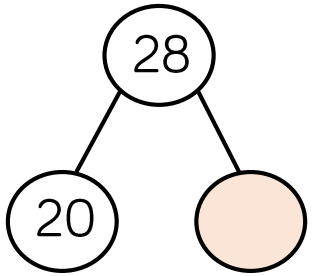
Varied Fluency

Match the number sentence to the correct number.

20 + 19	10 + 4	40 + 0	80 + 1

40	14	81	39

Complete the part-whole model and write four number sentences to match.



_____ + _____ = _____
_____ + _____ = _____
_____ = _____ + _____
_____ = _____ + _____

Dora has 20 sweets and Amir has 15 sweets.
Represent the total number of sweets:

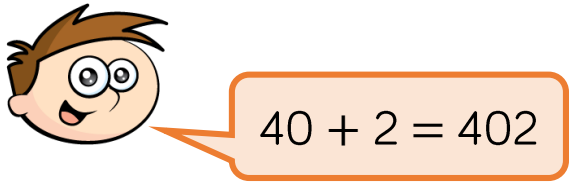
- With concrete resources.
- In a part-whole model.
- As a number sentence.

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Tens and Ones (2)

Reasoning and Problem Solving

Teddy thinks that,



Explain the mistake he has made.

Can you show the correct answer using concrete resources?

40 + 2 = 42
Teddy has just combined the numbers to make 402 without thinking about their place value.

Fill in the missing numbers.

1 ten + 3 ones = 13

2 tens + ___ ones = 23

3 tens + 3 ones = ____

___ tens + 3 ones = 43

What would the next number in the pattern be?

1 ten + 3 ones = 13
2 tens + 3 ones = 23
3 tens + 3 ones = 33
4 tens + 3 ones = 43

5 tens + 3 ones = 53

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Place Value Charts

Notes and Guidance

Children should formally present their work in the correct place value columns to aid understanding of place value.

It is important for children to use concrete, pictorial and abstract representations in their place value chart.

Mathematical Talk

How many tens are there?

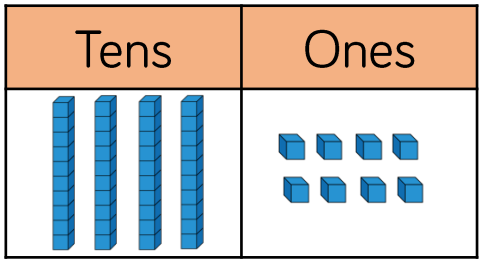
How many ones are there?

What is different about using Base 10 to using place value counters?

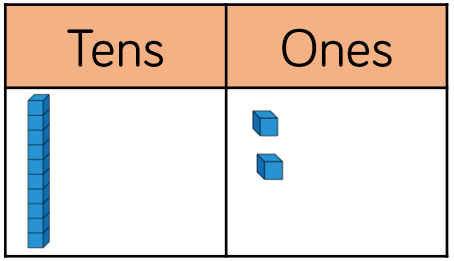
Can you write any other number sentences about the place value chart?

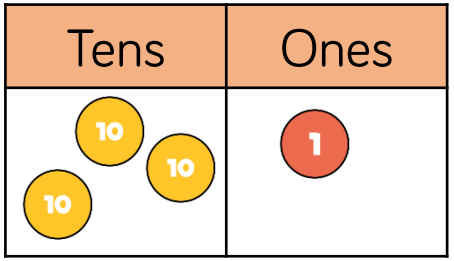
Varied Fluency

- What number is represented in the place value chart?



- Complete the place value chart using Base 10 and place value counters to represent the number 56





- What number is represented in the place value chart?

Tens	Ones
9	1

Write two different number sentences for this number.

____ + ____ = ____

____ = ____ + ____

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Place Value Charts

Reasoning and Problem Solving

How many two digit numbers can you make that have the same number of tens and ones?

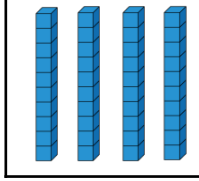
Show each one on a place value chart.

Tens	Ones

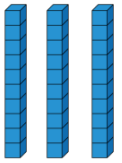
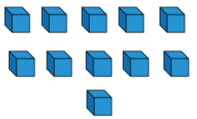
There are nine possibilities:
11, 22, 33, 44, 55, 66, 77, 88, 99

Do both place value charts show the same value?

A

Tens	Ones
	

B

Tens	Ones
	

What is the same?

What is different?

Yes, they both have the same value of 41

40 + 1 = 41

30 + 11 = 41

Same: Both A and B show 41

Different: There are a different number of tens and ones in each place value chart.

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Compare Objects

Notes and Guidance

Comparing objects is introduced once children have a secure understanding of numbers in a place value chart.

Children are expected to compare a variety of objects using the vocabulary 'more than', 'less than' and 'equal to' and the symbols <, >, =

Mathematical Talk

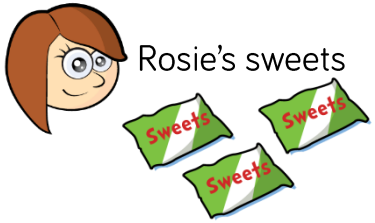
How can you arrange the objects to make them easy to compare?

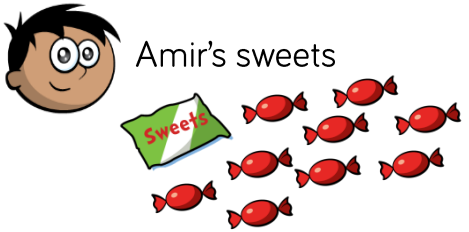
Do groups of ten help you count? Why?

Do groups of ten help you compare? Why?

Varied Fluency

- A packet of sweets contain 10 sweets.

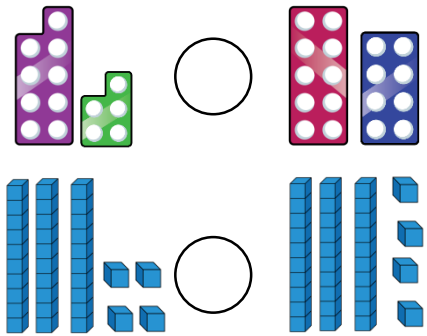


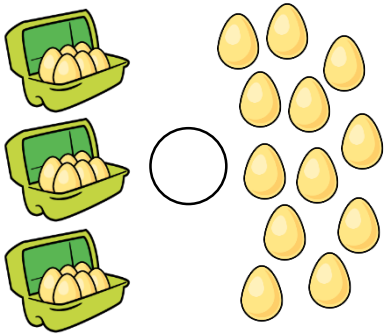


Who has the most sweets?

- Use cubes to show that:
  - Eleven is less than fifteen
  - 19 is greater than 9
  - 2 tens is equal to 20

- Use <, > or = to complete.





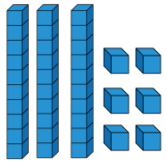
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Compare Objects

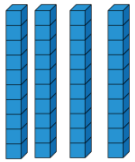
Reasoning and Problem Solving

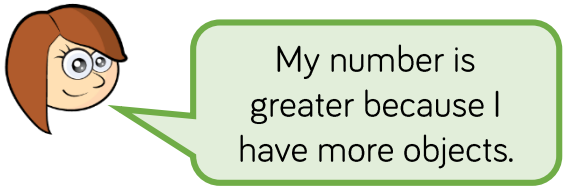
Rosie and Amir are comparing numbers they have made.

Rosie's number



Amir's number



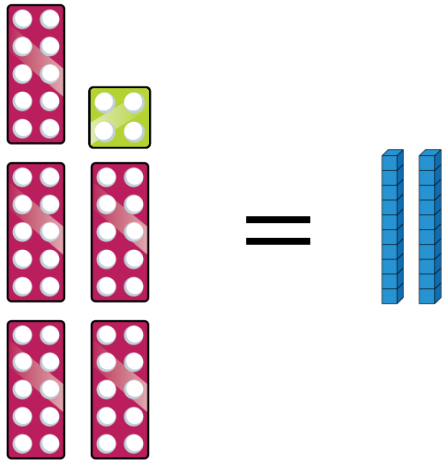


Is Rosie correct?

Explain your answer.

Rosie is incorrect because Amir has 4 tens which makes 40 and Rosie has 3 tens and 6 ones which makes 36, therefore Amir has more.

Add more Base 10 to make the number shapes and the Base 10 equal.



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

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

Children should add 3 tens and 4 ones to make 54 on both sides.

If the symbol changed to < the smallest amount they could add is 3 tens and 5 ones.

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Compare Numbers

Notes and Guidance

Children compare numbers using the language greater than, less than, more than, fewer, most, least and equal to.

They are able to use the symbols <, > and = to write number sentences.

Children should have access to concrete resources to help them justify their answers.

Mathematical Talk

Can you prove your answers using concrete resources?

Can you prove your answers by drawing a diagram?

Is there more than one answer?

Do you need to work the number sentences out to decide which is greater?

Varied Fluency

Complete the statements using **more than**, **less than** or **equal to**.

42 is _____ 46

81 is _____ 60 + 4

30 + 8 is _____ thirty-eight

Complete the number sentences.

4 tens and 9 ones > _____

_____ < 70 + 5

_____ = eight tens

Put <, > or = in each circle to make the statements correct.

28 ◯ 30

90 ◯ 70 + 28

30 + 23 ◯ 40 + 13

20 + 14 ◯ 24

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Compare Numbers

Reasoning and Problem Solving

How many different numbers can go in the box?

$$13 < \square < 20$$

There are six different numbers:
14, 15, 16, 17, 18, 19

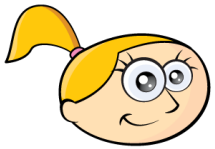
True or False?

One ten and twelve ones is bigger than 2 tens.

Explain how you know.

True
One ten and twelve ones = 22
Two tens = 20

Eva says,



When comparing numbers, the number with the highest number of ones is always the bigger number.

Do you agree?
Give some examples to support your answer.

Disagree, for example 19 is smaller than 21

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Order Objects and Numbers

Notes and Guidance

Children order numbers and objects from smallest to greatest or greatest to smallest.
They should be encouraged to use concrete or pictorial representations to prove or check their answers.
Children use the vocabulary 'smallest' and 'greatest' and may also use the < or > symbols to show the order of their numbers.

Mathematical Talk

How does the number line help you order the numbers?

How does Base 10 prove that your order is correct?

How did you know which of the diagrams represented the smallest/greatest number?

Did you look at the tens or ones?

Varied Fluency

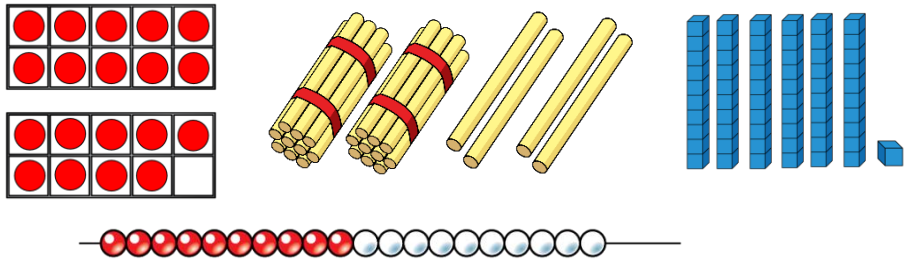
- Circle the numbers 48, 43 and 50 on the number line.



Put the numbers 48, 43 and 50 in order starting with the smallest.

- Use Base 10 to make the numbers sixty, sixteen and twenty-six.
Write the numbers in order starting with the greatest number.

- The diagrams represent different numbers.



Circle the greatest number.
Circle the smallest number.
Complete the number sentence _____ > _____

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Order Objects and Numbers

Reasoning and Problem Solving

Order the numbers below.
Which would be the fourth number?

33 53 37

29 34 43

Explain how you ordered them.

If I ordered them from smallest to largest:
29, 33, 34, 37, 43, 53 then 37 would be the fourth number.

Alternatively, if I order the numbers from largest to smallest:
53, 43, 37, 34, 33, 29 then 34 would be the fourth number.

Mo has written a list of 2-digit numbers.



The digits of each number add up to five.
None of the digits are zero.

Can you find all the numbers Mo could have written?

Write the numbers in order from smallest to largest.

What strategy did you use?

14, 23, 32, 41

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Count in 2s

Notes and Guidance

Children build on their previous knowledge of counting in multiples of 2 and go beyond 20 up to 50

They will apply previous learning of one more and one less to counting forwards and backwards in twos. For example, two more than and two less than. The 1-50 grid can be used to spot and discuss patterns that emerge when counting in 2s.

Mathematical Talk

How can we count the pairs?
What does it mean to count in pairs?

Can we use tens frames to help us count in 2s?
Can you see any patterns when you count in 2s?

Varied Fluency

R

- How many socks are there?



There are ___ socks in total.

How many gloves are there?

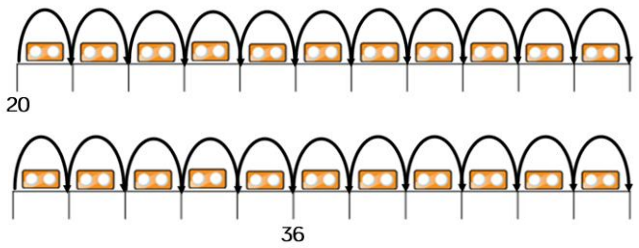


There are ___ gloves in total.
Represent the gloves using ten frames.

- Continue colouring in 2s on the grid. 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

- Complete the number lines by counting in 2s.



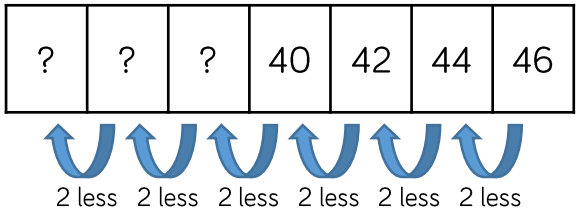
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Count in 2s

Reasoning and Problem Solving

R

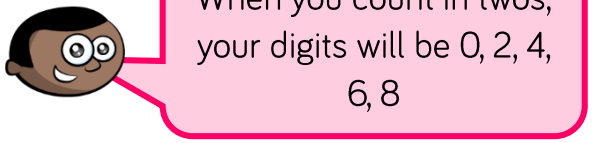
Count in 2s backwards to complete the number track.



If you continue counting, will you say the number 25?

38, 36, 34
Possible answer:
Children will not say 25 because it is not a multiple of 2, they will say 28, 26, 24 and 22

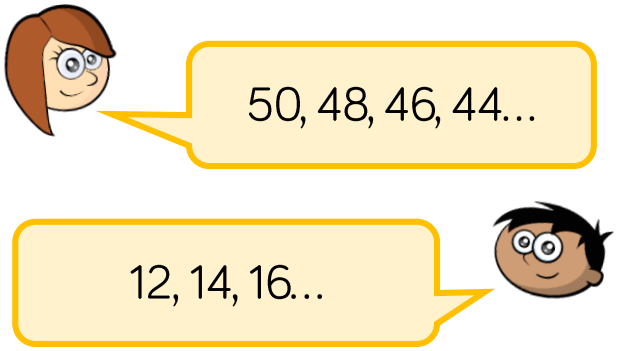
Always, sometimes, never...



Prove it!

Sometimes. It depends on your starting number.
For example 1, 3, 5...
Also for 12, 14, 16, the tens digit is 1

Rosie counts back from 50 in 2s.
Amir counts up from 12 in 2s.



They say their numbers together.
Who will say 30 first.

Rosie says 11 numbers to reach 30
Amir says 10 numbers to reach 30
So Amir will get there first.

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Count in 5s

Notes and Guidance

Children build on previous learning of counting in fives to go beyond 20 and up to 50

The 1-50 grid can be used to spot and discuss patterns that emerge when counting in 5s.

Mathematical Talk

How can we count the groups of 5?

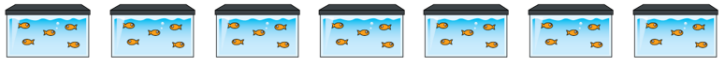
Can you describe the pattern when you count in 5s?

Will _____ appear on our number line? Why/why not?

Varied Fluency

R

How many fish are there?



There are ___ fish in each tank.
There are ___ tanks.
There are ___ fish altogether.

How many grapes are there?

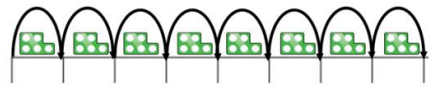


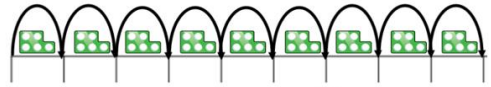
There are ___ grapes in each bunch.
There are ___ bunches.
There are ___ grapes altogether.

Continue counting in 5s on the grid.

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

Complete the number lines by counting in 5s.





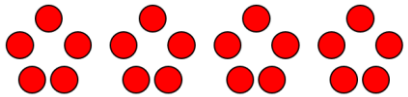
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Count in 5s

Reasoning and Problem Solving

R

Amir is making this flower pattern with counters.



Annie says,



If you make 9 flowers, you will use 43 counters.

Do you agree with Annie?
Explain your answer.

Annie is wrong because 43 does not end in a 5 or a 0

If she makes 9 flowers she will use 45 counters.

Odd One Out

25

30

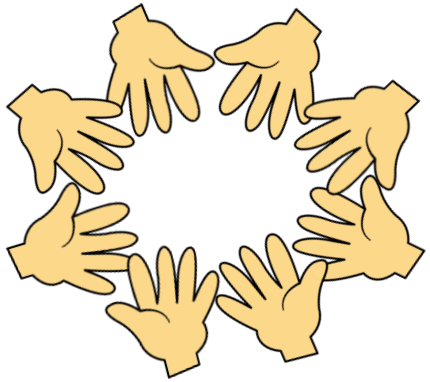
27

45

Which is the odd one out? Explain your answer.

27 because you would not count it if you were counting in 5s. Children also may give other responses.

Work in groups.
Create a circle with your hands. You can choose to put in one hand or both hands.



Count how many fingers and thumbs you can see altogether.

Can you predict how many? Count to check.

Children can practise counting in 5s and recognise one hand is worth 5 They may start to spot patterns and reason about how many there will be.

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Count in 10s

Notes and Guidance

Children count in groups of tens for the first time. Previously they have counted in 2s and 5s.
They use pictures, bead strings and number lines to support their counting.

Counting in 10s on a hundred square will also support children to see the similarities between the numbers when we count in tens.

Mathematical Talk

How many birds/flowers are there in total?

How can we use our number lines to help us count them?

Will _____ appear on our number line? Why?

What is the same about all the numbers we say when we are counting in tens?

Varied Fluency

R

How many birds are there altogether?



There are _____ birds in each tree.
There are _____ trees.
There are _____ birds altogether.

How many flowers are there altogether?



There are _____ flowers in each bunch.
There are _____ bunches.
There are _____ flowers altogether.

Use a 0-100 bead string to count in tens.
Can we count forwards and backwards in tens?



Can we count in tens on a number track as well?
How does this match counting on a bead string?

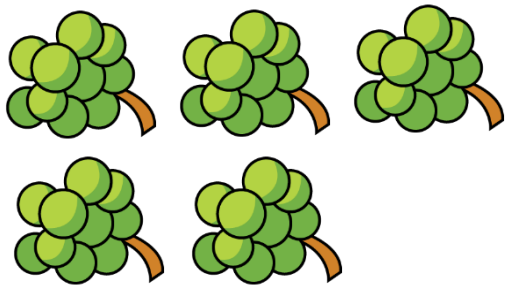
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Count in 10s

Reasoning and Problem Solving

R

In a shop, grapes come in bunches of 10



Max wants to buy forty grapes.

Are there enough grapes?

Yes there are enough grapes. There are fifty grapes and Max only needs forty.

Jemima is counting in 10s on part of a hundred square.

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

She starts at 10

Shade in all the numbers Jemima will say.

What is the same about the numbers she says?

What is different about the numbers?

Jemima will say 10, 20, 30, 40 and 50
All the numbers have the same ones digit (0)
They all have different tens digit.
The tens digit goes up by 1 for each new number she says.

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Count in 3s

Notes and Guidance

Children count forwards and backwards in 3s from any multiple of 3

Encourage children to look for patterns as they count and use resources such as a number track, a counting stick and concrete representations.

Mathematical Talk

What do you notice about the numbers?

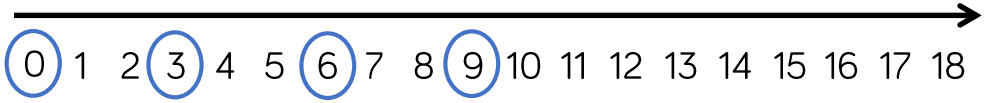
Are the numbers in the sequence getting larger or smaller?

Can you spot a pattern?

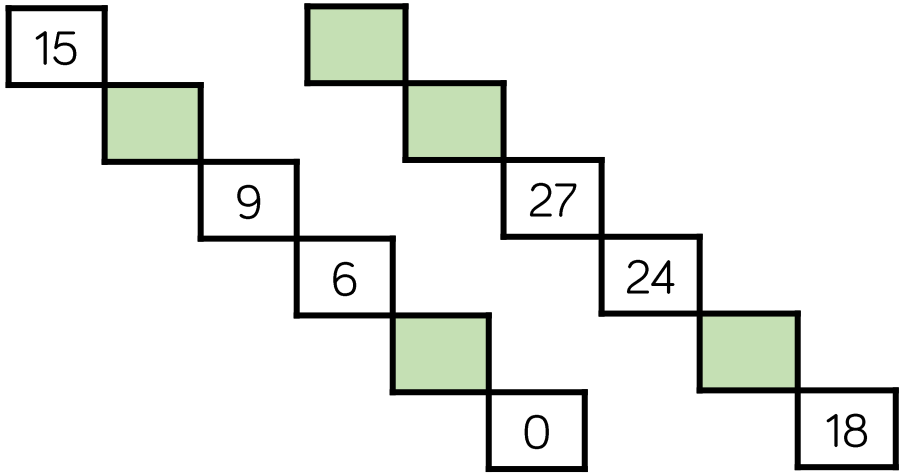
What are you counting up in?

Varied Fluency

- What do you notice about the numbers that are circled?
  Continue the pattern.



- Complete the number sequences.



- Amir has 15 stickers. He collects 3 more each day.
  Complete the number track to show how many he will have in six days.



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Count in 3s

Reasoning and Problem Solving

True or False?



I start at 0 and count in 3s
I say the number 14

Explain your answer.

False.
If I count in 3s I say 3, 6, 9, 12, 15....

Teddy is counting in 2s and Jack is counting in 3s.

Teddy	2	4	6	8
Jack	3	6	9	12
+				

Teddy says,



If we add our numbers together as we count we can make a new number pattern.

What pattern do they make?
What happens if both Teddy and Jack count in 5s and they add them together to make a new pattern?

If Teddy and Jack add their numbers together they will be counting in 5s.

If Teddy and Jack both count in 5s their new pattern would be counting in 10s.

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Autumn - Block 2

Addition & Subtraction

Overview

Small Steps

1. Fact families – addition and subtraction bonds to 20
2. Check calculations
3. Compare number sentences
4. Related facts
5. Bonds to 100 (tens)
6. Add and subtract 1s
7. 10 more and 10 less
8. Add and subtract 10s
9. Add by making 10 (R)
10. Add a 2-digit and 1-digit number – crossing ten
11. Subtraction - crossing 10 (R)
12. Subtract a 1-digit number from a 2-digit number – crossing ten
13. Add two 2-digit numbers – not crossing ten – add ones and add tens
14. Add two 2-digit numbers – crossing ten – add ones and add tens

Notes for 2020/21

Adding by making 10 can be a difficult concept for children to grasp therefore we have included this as a recap from Year 1.

Similarly subtraction crossing 10 is recapped before children move onto more formal subtraction.

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Overview

Small Steps

- Subtract a 2-digit number from a 2-digit number – not crossing ten
- Subtract a 2-digit number from a 2-digit number – crossing ten – subtract ones and tens
- Find and make number bonds (R)
- Bonds to 100 (tens and ones)
- Add three 1-digit numbers

Notes for 2020/21

Number bonds are an important aspect of mathematics. Extra time is devoted to this to help children become fluent.

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Fact Families

Notes and Guidance

Children apply their understanding of known addition and subtraction facts within 20 to identify all related facts.
This will include an understanding of the relationship between addition and subtraction, and knowing the purpose of the equals sign, as well as the addition and subtraction signs.
Showing the link between representations, such as part-whole models and bar models can support and deepen the children's understanding.

Mathematical Talk

What if we took away the red flowers? What are the parts? What is the whole?

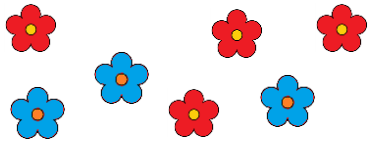
Does it change the answer if we add the blue and red flowers in a different order?

What does each circle represent on the part-whole model?

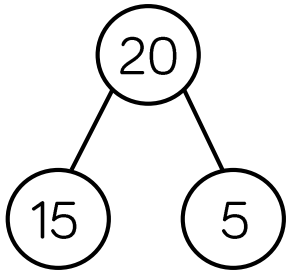
How many different number sentences are there in the fact family?

Varied Fluency

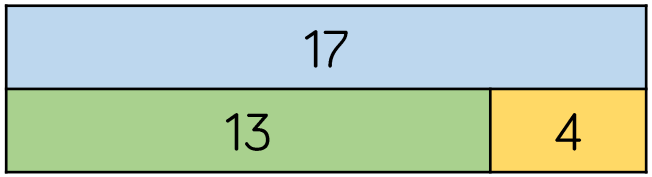
- Using concrete apparatus, can you talk about the relationships between the different flowers?



- One relationship shown by this part-whole model is 15 + 5 = 20
Can you write all associated number sentences in the fact family?



- Look at the bar model below.
Can you write all of the number sentences in the fact family?

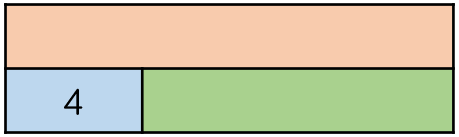


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Fact Families

Reasoning and Problem Solving

Here is an incomplete bar model.
The total is greater than 10 but less than 20
What could the missing numbers be?
How many different combinations can you find?



7 and 11
8 and 12
9 and 13
10 and 14
11 and 15
12 and 16
13 and 17
14 and 18
15 and 19

Rosie says,

$8 - 5 = 3$
$8 - 3 = 5$
$8 = 5 - 3$
$3 = 8 - 5$

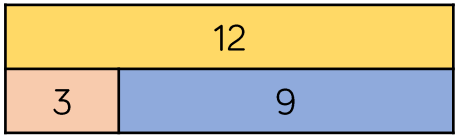


I think that all of these facts are correct because the numbers are related

Ron disagrees.
Who is correct? Can you prove it?

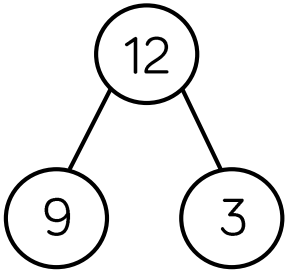
Ron is correct because 8 is not equal to 5 – 3

Which of the representations are equivalent to the bar model?



$12 = 9 + 3$

There are 9 cars in a car park, 3 cars leave.



$9 - 3 = 12$



The number line, the part-whole model and $12 = 9 + 3$

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Check Calculations

Notes and Guidance

It is essential that children have the opportunity to discuss and share strategies for checking addition and subtraction calculations.
Checking calculations is not restricted to using the inverse.
Teachers should discuss using concrete resources, number lines and estimating as part of a wide range of checking strategies.

Mathematical Talk

What resources could you use to check your calculation?

Can you check it in more than one way?

Why do we need to check our calculation?

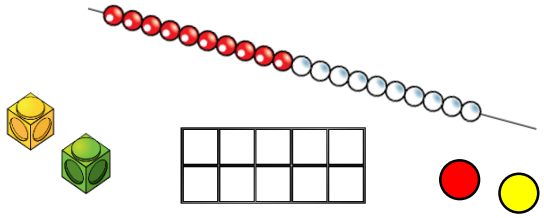
Is there another way you could represent this?

Varied Fluency

- Use concrete objects to check and prove whether the calculations are correct.

$12 - 4 = 8$

$7 + 8 = 15$



- Can you use inverse operations to check $5 + 12 = 17$?



How many possible inverse calculations are there?

- Eva writes this calculation: $18 - 5 = 13$
Which of the following could she use to check her work?

$13 + 5$	$13 - 5$
$18 - 13$	$5 + 13$

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Check Calculations

Reasoning and Problem Solving

Eva did the following calculation:

$$12 - 8 = 4$$

She checked it by using the inverse.

She did $12 + 8 = 20$ and said that her first calculation was wrong.

What advice would you give her?

It should have been $8 + 4 = 12$ or $4 + 8 = 12$

Teddy is checking Dora's work but doesn't do an inverse calculation.



These calculations can't be right.

$$24 + 6 = 84$$
$$25 - 23 = 12$$
$$18 - 3 = 21$$

How might he know?

What errors have been made in each calculation?

All of the calculations involve errors:

6 has been added to the tens instead of the ones.

25 and 23 are very close in value and therefore can't result in such a large difference.

18 and 3 have been added instead of subtracted.

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Compare Number Sentences

Notes and Guidance

Children should be encouraged to examine number sentences to find missing values using structure rather than calculation.
Using numbers within 20 to explore mathematical relationships will give the children confidence and allow them to spot patterns because they are working within the context of familiar numbers.
Children should compare similar calculations using greater than, less than and equal to symbols.

Mathematical Talk

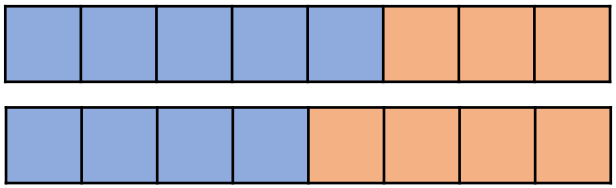
What other numbers make the same total?

Do we need to calculate the answer to work out the missing symbol?

Do you notice a pattern? What would come next?

Varied Fluency

- How can we use the following representation to prove that $5 + 3 = 4 + 4$?



- Fill in the circles with either $<$, $>$ or $=$

$6 + 4 \bigcirc 6 + 5$

$6 + 4 \bigcirc 3 + 6$

$11 - 4 \bigcirc 12 - 5$

$11 - 4 \bigcirc 12 - 4$

- Complete the missing numbers.

$5 + 3 = 6 + _____$

$5 + 3 = _____ + 6 = 7 + _____$

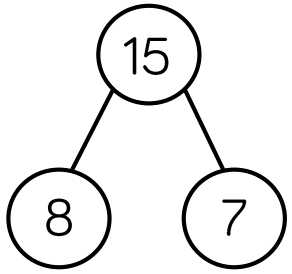
$_____ + 3 = _____ + 4 = 5 + 5$

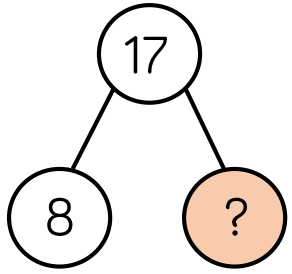
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Compare Number Sentences

Reasoning and Problem Solving

Rosie thinks she knows the missing number without calculating the answer.





Can you explain how this could be possible?

17 is two more than 15, so the missing number must be two more than 7

The missing number must be 9

Both missing numbers are less than 10

$$7 + \square < 7 + \square$$

How many different possible answers can you find?

Lots of different combinations, the left number has to be smaller than the right.

Possible answers:
1 and 2
1 and 3
1 and 4
1 and 5
1 and 6
1 and 7
1 and 8
1 and 9
2 and 3
Etc.

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Related Facts

Notes and Guidance

Children should have an understanding of calculations with similar digits. For example, $2 + 5 = 7$, so $20 + 50 = 70$
This involves both addition and subtraction. It is important to highlight the correct vocabulary and help children to notice what is the same and what is different between numbers and calculations.
'Tens' and 'ones' should be used to aid understanding.
Using Base 10 can also help the children to see relationships.

Mathematical Talk

What is the same? What is different?

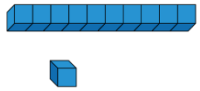
How does Base 10 help us to see the relationships between the different numbers and calculations?

What do you notice about the part-whole models?

Is there a relationship between the numbers that are represented?

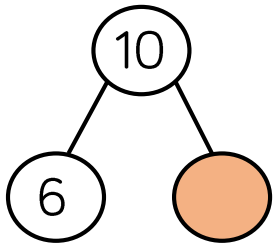
Varied Fluency

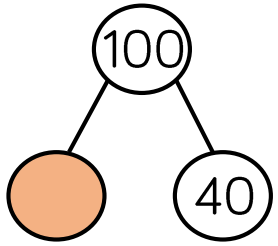
I have 3 blue pens and 4 black pens. Altogether I have 7 pens.
Tommy has 30 blue pens and 40 black pens. How many pens does he have in total?



Use concrete apparatus to show your thinking.

Complete the part-whole models below:





Find the missing numbers in the related facts.

$5 + 4 = 9$ $\quad$ $8 = 3 + 5$ $\quad$ $4 = 10 - 6$

$50 + 40 =$ _____ $\quad$ $80 = 30 +$ _____ $\quad$ $40 =$ _____ $- 60$

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Related Facts

Reasoning and Problem Solving

Continue the pattern.

$$90 = 100 - 10$$
$$80 = 100 - 20$$
$$70 = 100 - 30$$

What are the similarities and difference between this pattern and the following one?

$$9 = 10 - 1$$
$$8 = 10 - 2$$
$$7 = 10 - 3$$

$60 = 100 - 40$
$50 = 100 - 30$
Etc.

The digits are the same but the place value changes.

Alex says,



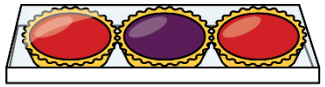
If I know $9 + 1 = 10$, I can work out $90 + ___ = 100$

Find the missing number and explain how Alex knows.

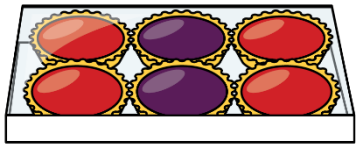
10

All the numbers are ten times greater.

Whitney has 3 jam tarts.



Tommy has 6 jam tarts.



Altogether they have 9 jam tarts.

$3 + 6 = 9$
So
$___ + ___ = 90$

What if all of the red jam tarts are eaten?

What if all of the purple jam tarts are eaten?

$30 + 60 = 90$

If all of the red tarts are eaten then
$1 + 2 = 3$
so
$10 + 20 = 30$

If all of the purple tarts are eaten then
$2 + 4 = 6$
so
$20 + 40 = 60$

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Bonds to 100 (Tens)

Notes and Guidance

Teachers should focus at this stage on multiples of 10 up to and within 100

Links should be made again between single digit bonds and tens bonds.

Using a 10 frame to represent 100 would be a useful resource to make this link.

Mathematical Talk

What does the word multiple mean?

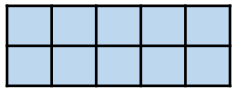
What does the blue represent? What does the yellow represent?

Why is it different to a normal 10 frame?

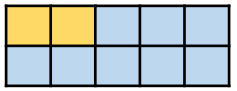
What patterns can you see? How does this help us to make up our own?

Varied Fluency

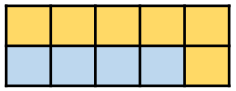
- Match the 10 frames to the sentences below:



One hundred equals eighty plus twenty



$100 = 100 + 0$



$40 + 60 = 100$

- Fill in the missing numbers. Use Base 10 to represent the numbers..

$2 + 6 = 8$

$20 + 60 =$ _____

$2__ + __0 = 80$

$80 = __0 + 6__$

- Continue the pattern

$90 = 100 - 10$
$80 = 100 - 20$

Can you make up a similar pattern starting with the numbers 60, 30 and 90?

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Bonds to 100 (Tens)

Reasoning and Problem Solving

Eva thinks there are 10 different number bonds to 90 using multiples of 10
Amir thinks there are only 5

Who is correct?

Can you help the person who is wrong to understand their mistake?

Amir because
0 + 90 is the same as 90 + 0
Eva has repeated her answers – the multiples have been written the opposite way around.

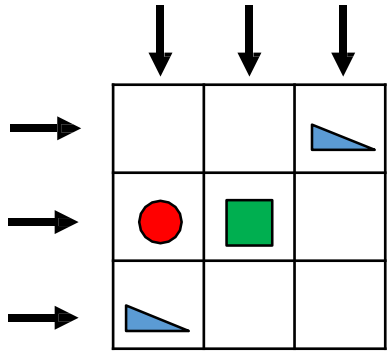
Using multiples of 10, how many number bonds are there for the following numbers?

20 30 40 50

What do you notice about the amount of bonds for each number?

If 80 has 5 bonds, predict how many 90 would have.

20 and 30 both have 2.
40 and 50 both have 3.
When the tens digit is odd it has the same number of bonds as the previous tens number. 90 would also have 5.

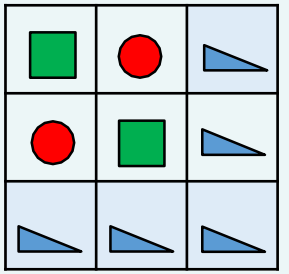


Squares are worth 10
Triangles are worth 20
Circles are worth 30

Can you complete the grid above so that all horizontal and vertical lines equal 60?

Can children create another pattern on an empty grid where each line equals 60?
How many possible ways are there to solve this?

Solution



Lots of possible solutions available.

©White Rose Maths

Add and Subtract 1s

Notes and Guidance

Children should start seeing the pattern when we add and subtract 1 and comment upon what happens.

This is the step before finding ten more than or ten less than, as bridging beyond a 10 should not be attempted yet.

The pattern should be highlighted also by adding 2 (by adding another one) and then adding 3

Mathematical Talk

What happens when we add 2?

What is the link between adding 1 and adding 2?

What about if we want to add 3?

How can a bead string help when we are adding 1, 2, 3 etc.?

Where will be the best place to start on each number track? Why?

Varied Fluency

- Create sentences based on the picture.



Example

There are 4 children playing in a park.
One more child joins them so there will be 5 children playing together.

- Continue the pattern

$22 = 29 - 7$
$22 = 28 - 6$

Can you create an addition pattern by adding in ones and starting at the number 13?



- Continue the number tracks below.

31			34		

		45			48

				67	

	13				

©White Rose Maths

Add and Subtract 1s

Reasoning and Problem Solving

True or False?

These four calculations have the same answer.

$1 + 4 + 2$ $\quad$ $4 + 2 + 1$

$2 + 4 + 1$ $\quad$ $4 + 1 + 2$

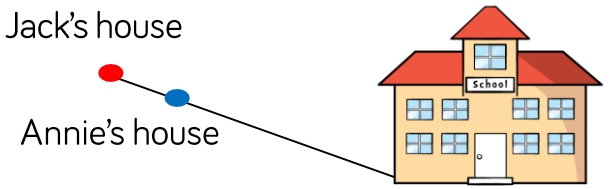
True, because they all equal 7 and addition is commutative.

These four calculations have the same answer.

$7 - 3 - 2$ $\quad$ $2 - 3 - 7$

$3 - 2 - 7$ $\quad$ $7 - 2 - 3$

False, because subtraction isn't commutative.



Jack lives 5 km from school.
Annie lives 4 km from school in the same direction.

What is the distance between Jack and Annie's houses?

1 km

After travelling to and from school, Jack thinks that he will walk 1 km more than Annie. Is he correct?
Explain your answer.

No, he will walk 2 km further. 1 km on the way to school and 1 km on the way home.

What will be the difference in distance walked after 2 school days?

4 km

©White Rose Maths

10 More and 10 Less

Notes and Guidance

Teaching needs to focus on the importance of the tens digit.
Using a 100 square, explore with the children what happens to the numbers in the columns.
Draw attention to the idea that the tens digit changes while the ones digit remains the same.
Children will need to see how the number changes with concrete materials before moving onto more abstract ideas.

Mathematical Talk

What's the same? What's different?

Will you start with 35 or 55? Why?

When you look at a hundred square, what do you notice about the numbers that are ten more and ten less than 27?

Which direction will your finger move on a hundred square if you are finding ten more/ten less?

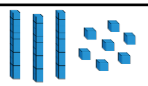
Varied Fluency

- Continue the number tracks below.

10	20	30						
			35	45	55			

- Using a 100 square, circle the number that is 10 more than 27
Circle the number that is 10 less than 27
Repeat in different colours for different numbers.
What do you notice?

- Using concrete materials, complete the missing boxes.

10 less	Number	10 more
		
2	12	22
		
	37	

©White Rose Maths

10 More and 10 Less

Reasoning and Problem Solving

SALE



The cost of each piece of fruit is reduced by 10 p.

What are the new prices?

Red Apple 5 p

Green Apple 12 p

Banana 25 p

Lemon 58 p

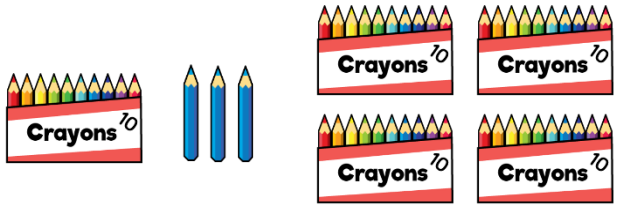
Mo says,



I know that 10 more than 72 is 82 because I only have to look at the tens digit.

Is he correct?
Explain your reasoning.

Yes, because when you add ten you aren't adding ones.



Class 3 gives one of their full packets of crayons away.

How many crayons do they have left?

Explain your reasoning.

43

They will have four full packs left which is four tens, and three crayon which represents three ones.

Rosie is counting backwards in 10s.
She says forty-nine, thirty-nine, twenty-nine and then stops.
What numbers comes next and why?

19 because you take one ten away from 29, then 9

©White Rose Maths

Add and Subtract 10s

Notes and Guidance

Children should make use of place value to add and subtract 10s from a given number within 100
The key teaching point again is the importance of the tens digit within the given numbers, and children should be encouraged to see the relationship.

For example $64 + 20 = 84$

Mathematical Talk

What is the number sentence that will help us to find the first missing number in the number track?

What is the same/different about the next number sentence?

Why is there a blank ones box?

Which column changes?

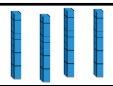
Which column stays the same?

Varied Fluency

Continue the number track by adding 20 each time.

23				

Use the place value charts and concrete materials to complete the calculations.

Tens	Ones
	
	

$$\begin{array}{r} 2\ 3 \\ +\ 4\ 0 \\ \hline \\ \hline \end{array}$$

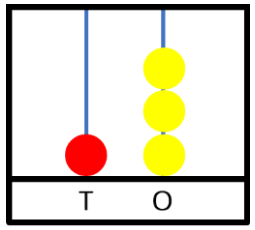
Tens	Ones
	
	

$$\begin{array}{r} 5\ 6 \\ -\ 3\ 0 \\ \hline \\ \hline \end{array}$$

©White Rose Maths

Add and Subtract 10s

Reasoning and Problem Solving



Tommy has three spare red beads.

What numbers could he make?
Explain your answer.

23

33

43

He doesn't have to use all of the beads.

Here are Class 2's crayons.

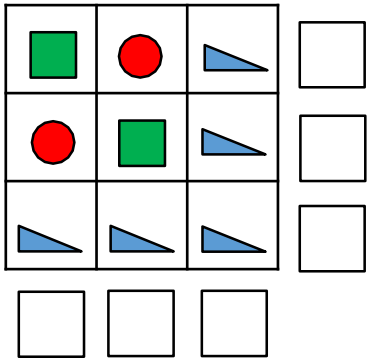


They are given a new box of 10 each day for a week.

How many crayons do they have at the end of the week?

Discussion could be had about whether it's a full week or a school week.

Answers would be 96 or 76 respectively.



Circles represent 20
Triangles represent 10
Squares represent 50

What is the value of each row and column?

Rows

(top to bottom)

80

80

30

Columns

(left to right)

80

80

30

©White Rose Maths

Add by Making 10

Notes and Guidance

Children add numbers within 20 using their knowledge of number bonds.
It is important that children work practically using ten frames and/or number lines to help them see how number bonds to 10 can help them calculate.
They will move towards using this as a mental strategy.

Mathematical Talk

How can you partition a number and use your number bonds to 10 to help you?

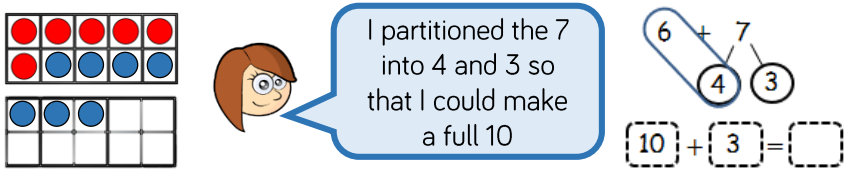
How does using the counters help you to see this strategy?

How does using a number line help you to see this strategy?

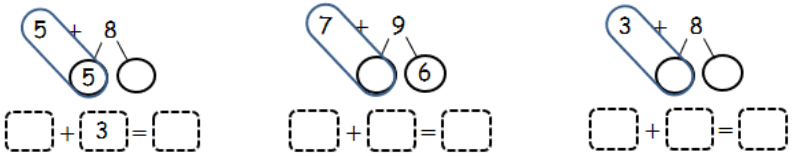
Varied Fluency

R

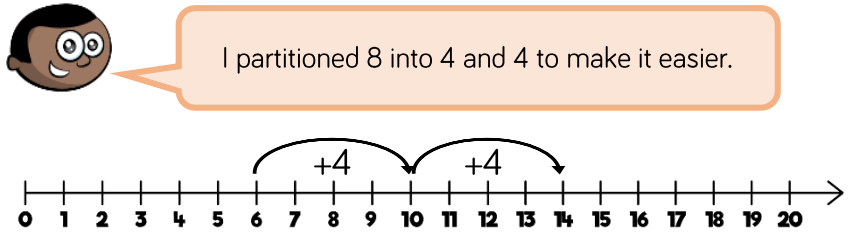
Rosie has used the 10 frames to calculate 6 + 7



Use Rosie's method to complete:



Mo has used a number line to calculate 6 + 8



Use Mo's method to calculate:

5 + 8 = ☐ 9 + 4 = ☐ 6 + 8 = ☐

©White Rose Maths

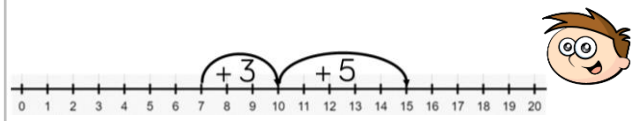
Add by Making 10

Reasoning and Problem Solving

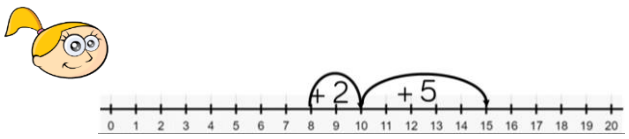
R

Teddy and Eva are adding together 7 and 8 using a number line.

Teddy shows it this way:



Eva shows it this way:



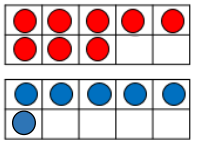
Who is correct?
Explain your answer.

They are both correct because addition is commutative and the answer to both calculations is 15

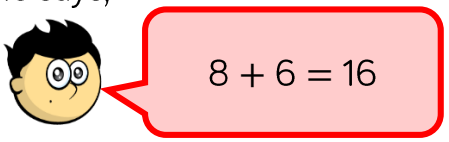
Teddy has started with 7 and partitioned the 8 into 3 and 5 to make 10

Eva has started with 8 and partitioned the 7 into 2 and 5 to make 10

Dexter uses ten frames to calculate eight plus six.



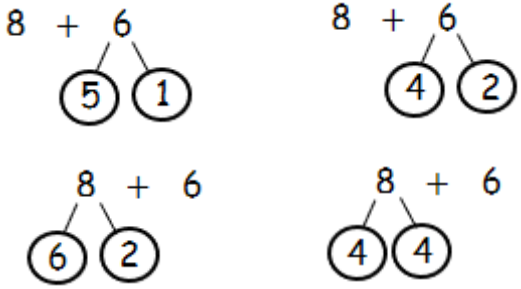
He says,



Do you agree?
Explain why.

Dexter is wrong because the answer should be 14. He should have filled the first ten frame before starting a second one.

Annie is calculating 8 + 6
Which of these methods is most helpful?
Why?



Partitioning the 6 into 4 and 2 is helpful as 8 and 2 make 10

Partitioning the 8 into 4 and 4 is helpful as 6 and 4 make 10

©White Rose Maths

Add 2-digits and 1-digit

Notes and Guidance

Before crossing the 10 with addition, children need to have a strong understanding of place value. The idea that ten ones are the same as one ten is essential here. They need to be able to count to 20 and need to be able to partition two-digit numbers in order to add them. They need to understand the difference between one-digit and two-digit numbers and line them up in columns. In order to progress to using the number line more efficiently, children need to be secure in their number bonds.

Mathematical Talk

Using Base 10, can you partition your numbers?

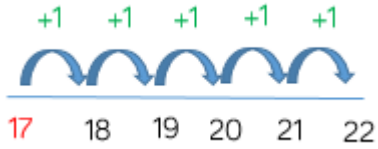
Can we exchange 10 ones for one ten?

How many ones do we have? How many tens do we have?

Can you draw the Base 10 and show the addition pictorially?

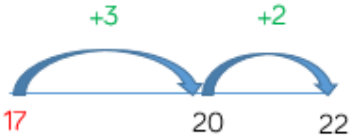
Varied Fluency

- 17 + 5 =

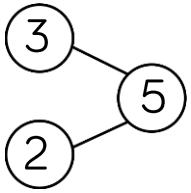


Can you put the larger number in your head and count on the smaller number? Start at 17 and count on 5

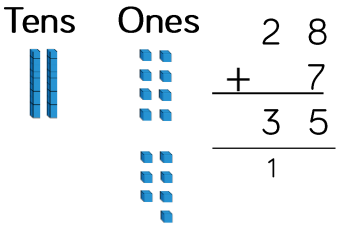
- Can we use number bonds to solve the addition more efficiently?



We can partition 5 into 3 and 2 and use this to bridge the 10



- Find the total of 28 and 7



$$\begin{array}{r} 2\ 8 \\ +\quad 7 \\ \hline 3\ 5 \\ \hline 1 \end{array}$$

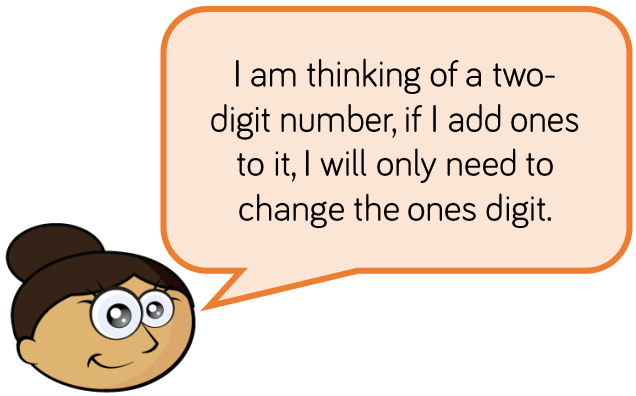
- Partition both the numbers.
- Add together the ones.
- Have we got 10 ones?
- Exchange 10 ones for 1 ten.
- How many ones do we have?
- How many tens do we have?

©White Rose Maths

Add 2-digits and 1-digit

Reasoning and Problem Solving

Always, Sometimes, Never



Explain your answer.

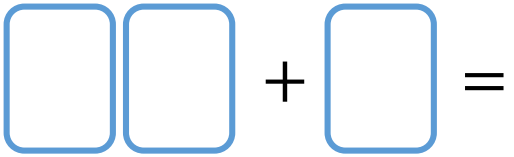
Sometimes, because if your ones total 10 or more you will have to exchange them which will change the tens digit.

Here are three digit cards.



Place the digit cards in the number sentence.

How many different totals can you find?



What is the smallest total?

What is the largest total?

67 + 8 = 75
68 + 7 = 75
76 + 8 = 84
78 + 6 = 84
86 + 7 = 93
87 + 6 = 93

75 is the smallest total.

93 is the largest total.

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Subtraction – Crossing 10 (1)

Notes and Guidance

For the first time, children will be introduced to subtraction where they have to cross ten. This small step focuses on the strategy of partitioning to make ten.

Children should represent this using concrete manipulatives or pictorially to begin with. Ten frames and number lines are particularly useful to model the structure of this strategy.

Children will move towards using this as a mental strategy.

Mathematical Talk

How can you partition a number to help you subtract?

How does using the counters help you to see this strategy?

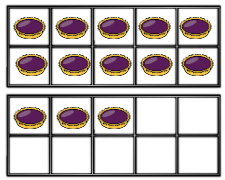
How does using a number line help you to see this strategy?

Can you think of another way to represent this problem?

Varied Fluency

R

First there were 13 jam tarts

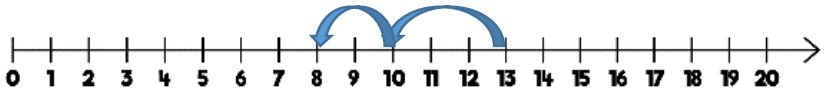


Then 5 were eaten

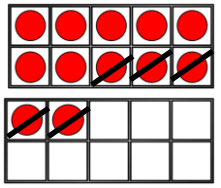


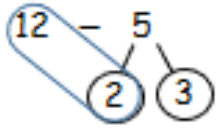
Now there are 8 jam tarts.





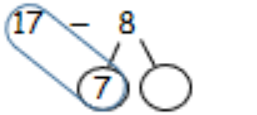
Rosie has used the ten frames to calculate 12 – 5



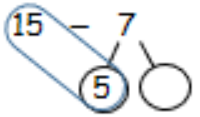


10 – 3 = 7

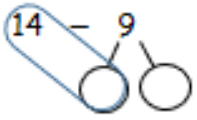
Use her method to complete:



10 – ☐ = ☐



☐ – ☐ = ☐



☐ – ☐ = ☐

©White Rose Maths

Subtraction – Crossing 10 (1)

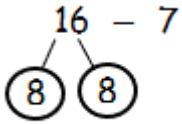
Reasoning and Problem Solving

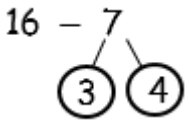
R

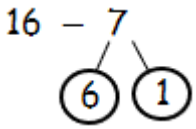
Rosie is calculating 16 – 7

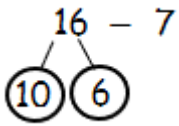


Which of these methods is most helpful? Why?









Could you find a way to partition 16 to help you subtract 7?

Partitioning the 7 into 6 and 1 is useful as Rosie can subtract the 6 to make 10 then subtract the 1

If you partition 16 into 7 and 9, you can subtract 7

Teddy works out 15 – 6
This is Teddy's working out:



15 – 5 = 10 – 1 = 9

Why is Teddy's working out wrong?

Teddy has used the = sign incorrectly.
10 – 1 is not equal to 15 – 5
He should have written:
15 – 5 = 10
10 – 1 = 9

Use <, > or = to make the statements correct.



I can do this without working out any answers.

17 – 5	◯	12 – 5
14 – 4	◯	18 – 8
11 – 7	◯	11 – 4

Is Whitney correct? Explain how you know.

17 – 5 > 12 – 5

14 – 4 = 18 – 8

11 – 7 < 11 – 4

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Subtract 1-digit from 2-digits

Notes and Guidance

Just as with addition, children need to have a strong understanding of place value for subtraction. Children need to be able to count to 20 and need to be able to partition two-digit numbers in order to subtract from them. They need to understand the difference between one-digit and two-digit numbers and line them up in columns.
In order to progress to using the number line more efficiently, children need to be secure in their number bonds.

Mathematical Talk

Are we counting backwards or forwards on the number line?

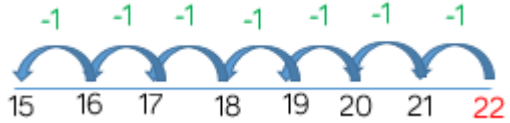
Have we got enough ones to subtract?

Can we exchange a ten for ten ones?

How can we show the takeaway? Can we cross out the cubes?

Varied Fluency

- 22 – 7 =

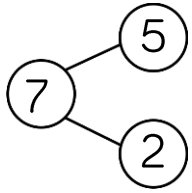


Can you put the larger number in your head and count back the smaller number? Start at 22 and count back 7

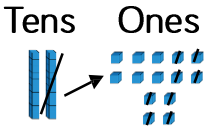
- Can we use number bonds to subtract more efficiently?



We can partition 7 into 5 and 2 and use this to bridge the 10



- Subtract 8 from 24



$$\begin{array}{r} {}^{1}\not{2}\,{}^{1}4 \\ -\quad 8 \\ \hline 1\ 6 \end{array}$$

- Do we have enough ones to take 8 ones away?
- Exchange one ten for ten ones.
- Take away 8 ones.
- Can you write this using the column method?

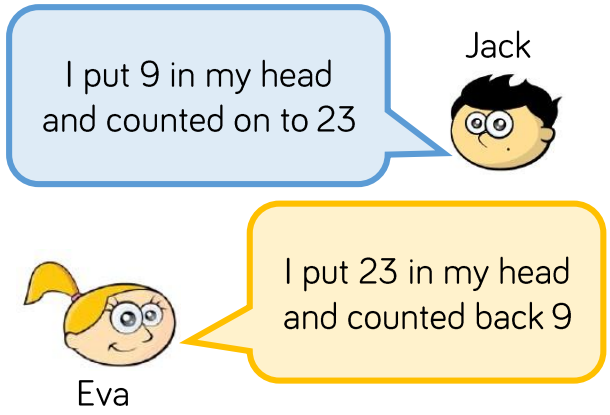
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Subtract 1-digit from 2-digits

Reasoning and Problem Solving

Jack and Eva are solving the subtraction 23 – 9

Here are their methods:



Who's method is the most efficient?

Can you explain why?

Can you think of another method to solve the subtraction.

Eva's method is most efficient because there are less steps to take. The numbers are quite far apart so Jack's method of finding the difference takes a long time and has more room for error.

Mo is counting back to solve 35 – 7

He counts

35, 34, 33, 32, 31, 30, 29

Is Mo correct?

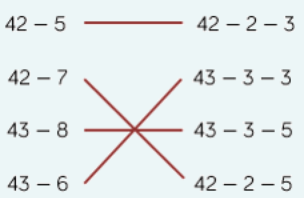
Explain your answer.

Mo is not correct as he has included 35 when counting back.

This is a common mistake and can be modelled on a number line.

Match the number sentences to the number bonds that make the method more efficient.

42 – 5	42 – 2 – 3
42 – 7	43 – 3 – 3
43 – 8	43 – 3 – 5
43 – 6	42 – 2 – 5



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Add 2-digit Numbers (1)

Notes and Guidance

This step is an important pre-requisite before children add two-digit numbers with an exchange.
Focus on the language of tens and ones and look at different methods to add the numbers including the column method.
It is important that teachers always show the children to start with the ones when adding using the column method.

Mathematical Talk

Can you partition the number into tens and ones?

Can you count the ones? Can you count the tens?

Can you show your addition by drawing the Base 10 to help?

How could you represent the problem?

Varied Fluency

Find the sum of 34 and 23

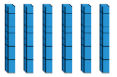
	Tens	Ones
		
+		

64 + 12 = _____

4 ones + 2 ones = _____

6 tens + 1 ten = _____

_____ tens + _____ ones = _____

	Tens	Ones
		
+		

Mo has 41 sweets. Whitney has 55 sweets.

How many sweets do they have altogether?

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Add 2-digit Numbers (1)

Reasoning and Problem Solving

Annie has 12 marbles.

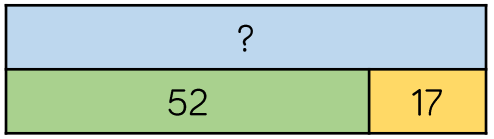
Ron has 13 marbles more than Annie.

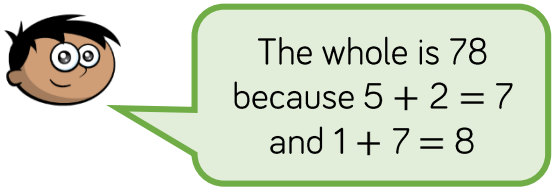
How many marbles do they have altogether?

Ron has 25 marbles.

Altogether they have 37 marbles.

Amir has been asked to complete the bar model.





Explain to Amir what he has done wrong. How could you help him work out the correct total?

Amir has found the digit totals and put the digits together to make 78

The correct answer is 69 and this could be shown by using Base 10 and a place value chart.

What digits could go in the boxes?

$\square 2 + \square 5 = 87$

Possible answers:
1 and 7
2 and 6
3 and 5
4 and 4
5 and 3
6 and 2
7 and 1

Interesting discussion could be had around is 1 and 7 different to 7 and 1?
Etc.

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Add 2-digit Numbers (2)

Notes and Guidance

Children use Base 10 and partitioning to add together 2-digit numbers including an exchange. They could be encouraged to draw the Base 10 alongside recording any formal column method.

They have already seen what happens when there are more than 10 ones and should be confident in exchanging 10 ones for one 10.

Mathematical Talk

Can you represent the ones and tens using Base 10?
What is the value of the digits?
How many ones do we have altogether?
How many tens do we have altogether?
Can we exchange ten ones for one ten?
What is the sum of the numbers?
What is the total?
How many have we got altogether?

Varied Fluency

64 + 17 = _____

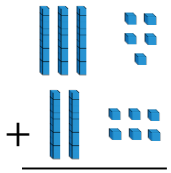
4 ones + 7 ones = _____

6 tens + 1 ten = _____

_____ tens + _____ ones = _____

$$\begin{array}{r} 64 \\ +\ 17 \\ \hline 11 \\ +\ 70 \\ \hline 81 \end{array}$$

Find the sum of 35 and 26



- Partition both the numbers.
- Add together the ones. Have we got 10 ones?
- Exchange 10 ones for 1 ten.
- How many ones do we have?
- Add together the tens. How many do we have altogether?

Class 3 has 37 pencils.
Class 4 has 43 pencils.



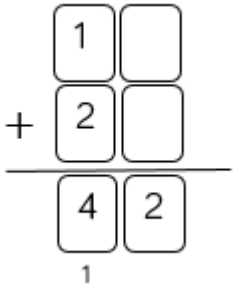
How many pencils do they have altogether?

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Add 2-digit Numbers (2)

Reasoning and Problem Solving

Can you create a calculation where there will be an exchange in the ones and your answer will have two ones and be less than 100?	There are lots of possible solutions. E.g. 33 + 29 = 62
How many different ways can you solve 19 + 11? Explain your method to a partner. Use concrete or pictorial resources to help explain your method.	Children might add the ones and then the tens. Children should notice that 1 and 9 are a number bond to 10 which makes the calculation easier to complete mentally.

Find all the possible pairs of numbers that can complete the addition.  How do you know you have found all the pairs? What is the same about all the pairs of numbers?	13 + 29 19 + 23 14 + 28 18 + 24 15 + 27 17 + 25 16 + 26 All the pairs of ones add up to 12

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Subtract with 2-digits (1)

Notes and Guidance

This step is an important step before children start to look at subtraction where they cross a tens boundary. Children need to use concrete materials but also draw images of the Base 10 so they can independently solve problems. Some children might think that they need to 'build' both numbers in the calculation, unpicking this misconception through modelling and discussion will help develop their understanding.

Mathematical Talk

Do we need to make both numbers in the subtraction before we take away?

Which number do we need to make? The larger number or the smaller?

What are the numbers worth? Tens or ones?

What happens if we have nothing left in a column? Which number do we write?

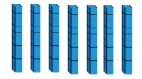
Varied Fluency

- 78 minus 34 = _____

  8 ones – 4 ones = _____

  7 tens – 3 tens = _____

  We have _____ tens and _____ ones.

Tens	Ones
	

- 34 – 13 = _____

34

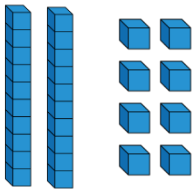
30 4

–10 –3

20 1

- Partition the number 34.
- Partition 13 and subtract the ones and the tens.
- Place the partitioned number back together.

- Subtract 13 from 28



$$\begin{array}{r} 2\ 8 \\ -\ 1\ 3 \\ \hline 1\ 5 \end{array}$$

©White Rose Maths

Subtract with 2-digits (1)

Reasoning and Problem Solving

Annie has 33 stickers.

Dexter has 54 stickers.

How many more stickers does Dexter have?

What method did you use to solve the problem?

Here the children are working out the difference.

Children might use subtraction to solve the problem or they might count on to find the difference.

Dexter has 21 more stickers than Annie.

Find the missing numbers.

$$\begin{array}{r} 6\,\square \\ -\ 2\,\square \\ \hline 4\ 2 \end{array}$$

Is this the only possible solution? Explain your answer.

Make the numbers using Base 10 to help you find your answer.

9 and 7

8 and 6

7 and 5

6 and 4

5 and 3

4 and 2

3 and 1

2 and 0

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Subtract with 2-digits (2)

Notes and Guidance

Children use their knowledge that one ten is the same as ten ones to exchange when crossing a ten in subtraction.

Continue to use concrete manipulatives (such as Base 10) and pictorial representations (such as number lines and part-whole models) to develop the children's understanding.

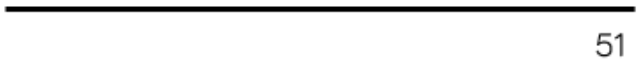
The skill of flexible partitioning is useful here when the children are calculating with exchanges.

Mathematical Talk

Have we got enough ones to take away?
Can we exchange one ten for ten ones?
How many have we got left?
What is the difference between the numbers?
Do we always need to subtract the ones first? Why do we always subtract the ones first?
Which method is the most efficient to find the difference, subtraction or counting on?

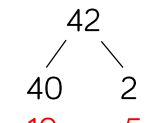
Varied Fluency

- Use the number line to subtract 12 from 51

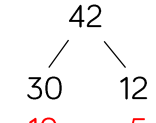


Can you subtract the ones first and then the tens?
Can you partition the ones to count back to the next ten and then subtract the tens?

- 42 – 15 =

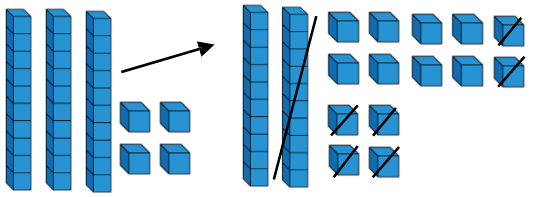


We can't subtract the ones. Can we partition differently?



Now we can subtract the ones and then subtract the tens.
42 – 15 = 27

- Take 16 away from 34



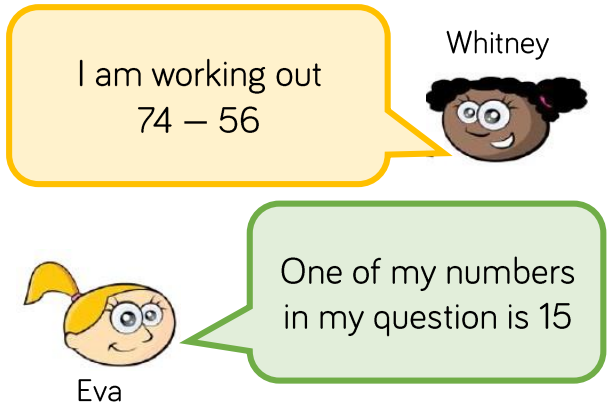
$$\begin{array}{r} {}^{2}\not{3}\,{}^{1}4 \\ -\ 1\ 6 \\ \hline 1\ 8 \end{array}$$

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Subtract with 2-digits (2)

Reasoning and Problem Solving

Eva and Whitney are working out some subtractions.



Whitney's answer is double Eva's answer.

What could Eva's subtraction be?

Whitney's answer is 18

Eva's answer is 9

Eva's question could be 15 – 6 or 24 – 15

Find the greatest whole number that can complete each number sentence below.

$45 - 17 > 14 + ___$

13

$26 + 15 < 60 - ___$

18

Explain your answer.

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Find & Make Number Bonds

Notes and Guidance

Children see that working systematically helps them to find all the possible number bonds to 20
They will use their knowledge of number bonds to 10 to find number bonds to 20
Using examples such as, 7 + 3, 17 + 3 or 7 + 13 encourages children to see the link between bonds to 10 and bonds to 20 and reinforces their understanding of place value.

Mathematical Talk

What strategy could you use to make sure you find all the number bonds?

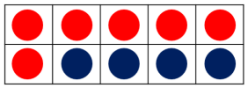
What number bond can we see? How does this help us find the number bond to 20?

How does knowing your number bonds to 10 help you to work out your number bonds to 20?

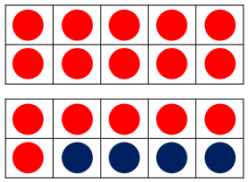
Varied Fluency

R

What number bond is represented in the pictures?

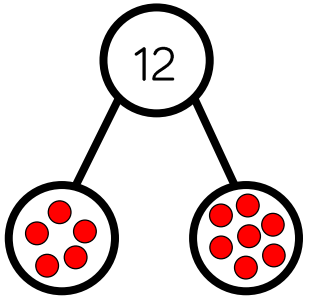


There are ___ red counters.
There are ___ blue counters.
Altogether there are ___ counters.
___ + ___ = ___ ___ + ___ = ___



There are ___ red counters.
There are ___ blue counters.
Altogether there are ___ counters.
___ + ___ = ___
___ + ___ = ___

Continue the pattern to find all the number bonds to 12
How do you know you have found them all?



12 = 12 + 0
12 = 11 + ___
12 = 10 + ___

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Find & Make Number Bonds

Reasoning and Problem Solving

R

Use equipment to represent each of the calculations below.

What is the same?
What is different?

$$7 + 3 = 10$$

$$17 + 3 = 20$$

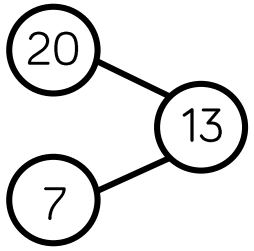
$$20 = 7 + 13$$

Explain your thinking.

Children may notice that the = is in a different place.
They might notice that the number of ones remains the same and that a ten has been added to create a number bond to 20
Mathematical equipment such as ten frames or Base 10 will make this clear.



Jack represents a number bond to 20 in the part whole model.



Can you spot his mistake?

Possible response: Jack has put 20 as a part but it should be a whole.

True or false?

There are double the amount of numbers bonds to 20 than there are number bonds to 10

Prove it – can you use a systematic approach?

False – there are 11 number bonds to 10 and 21 number bonds to 20 Children can show this in various ways.

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Bonds to 100 (Tens and Ones)

Notes and Guidance

Here children build on their earlier work on number bonds to 100 with tens together with number bonds to 10 and 20

They use their new knowledge of exchange to find number bonds to 100 with tens and ones.

Using hundred squares, Base 10, bead strings etc. will help the children develop their understanding.

Mathematical Talk

How many more do we need to make 100?

How many tens are in 100?

If I have 35, do I need 7 tens and 5 ones to make 100? Explain why.

Can you make the number using Base 10?

Can you add more Base 10 to the number to make 100?

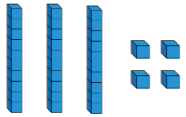
Varied Fluency

Use a 100 square. If:

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

- 40 squares are shaded, how many are not shaded?
- 45 squares are shaded, how many are not shaded?
- 54 squares are shaded, how many are not shaded?

Tommy is making 100 with Base 10
How much more does he need if he has:

- 
- 5 tens and 3 ones
- 37

Children could place their Base 10 on top of a 100 piece to help them calculate.

$25 + ___ = 100$

$___ + 69 = 100$

$100 - 84 = ___$

$100 - ___ = 11$

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Bonds to 100 (Tens and Ones)

Reasoning and Problem Solving

Teddy has completed the missing number sentence.

$$46 + 64 = 100$$

Is Teddy correct?
Explain your answer.

Teddy is incorrect. He has seen number bonds to 10 but forgotten that he would need to exchange ten ones for one ten.
46 + 64 = 110

Each row and column adds up to 100.

Complete the grid.

45	45	
	35	
15		65

45	45	10
40	35	25
15	20	65

Complete the pattern.

$$15 + 85 = 100$$
$$20 + 80 = 100$$
$$25 + 75 = 100$$
$$30 + __ = 100$$
$$__ + __ = 100$$

Can you explain the pattern?

30 + 70 = 100
35 + 65 = 100
The first numbers are going up in fives and the second numbers are going down in fives. All of the number sentences are number bonds to 100

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Add Three 1-digit Numbers

Notes and Guidance

Children need to use their knowledge of commutativity to find the most efficient and quick way to add the three one-digit numbers.

They look for number bonds to 10 to help them add more efficiently.

Mathematical Talk

Can we change the order of the numbers to make the calculation easier?

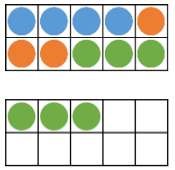
Why are we allowed to change the order of the numbers?

Which two numbers did you add first? Why?

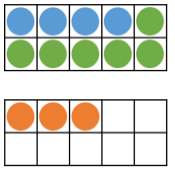
What if you added a different two numbers first, would your answer be the same?

Varied Fluency

Use ten frames and counters to add the numbers $4 + 3 + 6$



Can you add the numbers in a different way to find a number bond to 10?



$4 + 6 = 10$

$10 + 3 = 13$

Find the totals of each row and column.

5	4	2	
3	7	8	
5	7	3	

Use <, > or = to compare the number sentences.

$5 + 4 + 6 \bigcirc 6 + 5 + 4$

$7 + 3 + 8 \bigcirc 7 + 7 + 3$

$9 + 2 + 5 \bigcirc 8 + 3 + 5$

$8 + 4 + 2 \bigcirc 2 + 5 + 8$

©White Rose Maths

Add Three 1-digit Numbers

Reasoning and Problem Solving

Always, Sometimes, Never

odd + odd + odd = odd

Use one-digit numbers to test if this is true e.g.

3 + 5 + 7

Always, children may recognise that two odds make an even so three odds make an odd.

Which numbers would you add together first in the following number sentences? Why would you add those first?

3 + 5 + 7 =

8 + 2 + 6 =

4 + 3 + 4 =

3 and 7 first – number bond to 10

8 and 2 first – number bond to 10

4 and 4 first – double a number.

Is there always an easier order to add three one-digit numbers?

No, e.g. 5 + 6 + 7

Take 3 consecutive one-digit numbers, e.g. 4, 5 and 6.

Add them together.

What do you notice?

Choose different groups of 3 consecutive one-digit numbers and see if there is a pattern.

1 + 2 + 3 = 6
2 + 3 + 4 = 9
3 + 4 + 5 = 12
4 + 5 + 6 = 15
5 + 6 + 7 = 18
6 + 7 + 8 = 21
7 + 8 + 9 = 24

If we order the groups, we can see that the totals go up by 3 each time. This is because we are adding one to each number each time so we are adding 3 extra altogether.

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Autumn - Block 3

Money

Overview

Small Steps

- Recognising coins and notes (R)
- Count money – pence
- Count money – pounds (notes and coins)
- Count money – notes and coins
- Select money
- Make the same amount
- Compare money
- Find the total
- Find the difference
- Find change
- Two-step problems

Notes for 2020/21

Children may have missed learning on money in Year 1.

Before starting this block ensure that children are familiar with coins and notes.

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Recognising Coins

Notes and Guidance

Children will recognise and know the value of different denominations of coins.
Children will use their knowledge of place value to match coins with equivalent values. For example, ten 1 pence coins is equivalent to one 10 pence coin. This could be linked with the concept of exchanging.
Teachers could use coins to support this activity (or pictures where appropriate).

Mathematical Talk

How have you organised the coins?

What is the value of each coin? How do you know?

How many 1 pence coins will you need to make 2 p? 5 p? 10 p? 20 p? 50 p? 1 pound?

How many 1 pound coins will you need to make 2 pounds?

Varied Fluency

R

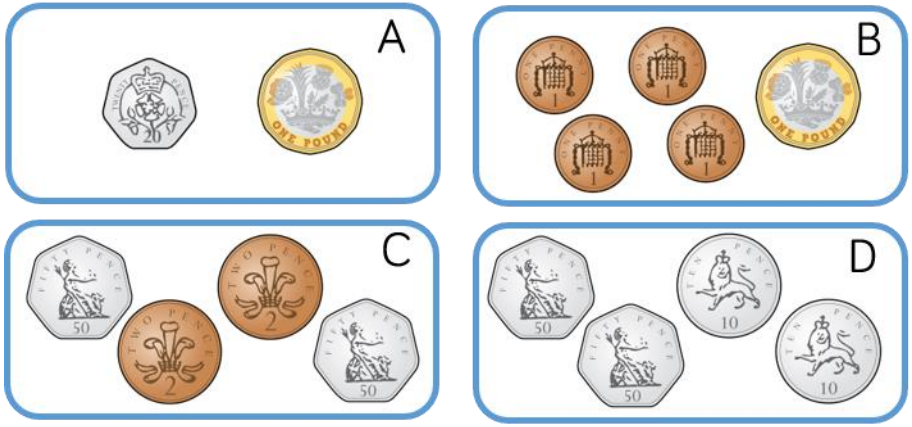
- Organise the coins on your table into pence and pounds.
  Can you name each coin?



- Write down the value of each coin.



- Match the cards with equal values.



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Recognising Coins

Reasoning and Problem Solving

R

Dora says:



Do you agree with Dora?

Justify your answer.

Dora is incorrect.

A 50 p coin isn't round.
A 20 p coin isn't round.
A £1 coin isn't round.

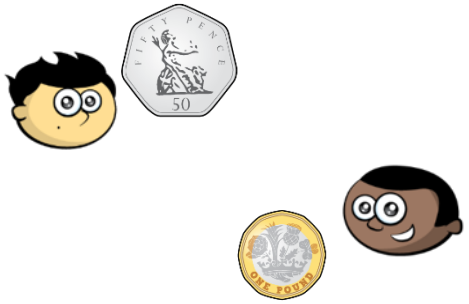
Which is the odd one out?

20 p | 8 p | 2 p | 10 p

Why?

8 p is the odd one out because we do not have an 8 p coin.

The tooth fairy left some money for two children.



Jack has 50 pence. Mo has one pound.

Jack thinks he has more money because his coin is physically bigger.

Explain why Jack is wrong.

Jack is wrong because although the 50 pence coin is physically bigger it only has a value of 50 pence, but the pound coin has a value of 100 pence.

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Recognising Notes

Notes and Guidance

Once children are able to identify and recognise coins they need to be able to recognise notes.

Children use their understanding of place value to see that one note can represent many pounds, for example, a ten pound note could be 10 pound coins or 3 two pound coins and 4 one pound coins. Children also need to be aware that one note may be worth many times the value of another note.

Mathematical Talk

Can you name each note?

What is the same about each note?

What is different about each note?

How many ___ pound notes are equivalent to a ___ pound note?

Varied Fluency

R

How many of each note can you see?



There are _____ 5 pound notes.
There are _____ 10 pound notes.
There are _____ 20 pound notes.

What is the value of each note?

 = ☐ pounds

 = ☐ pounds

 = ☐ pounds

Fill in the blanks.

One  = ☐ 

One  = ☐ 

©White Rose Maths

Recognising Notes

Reasoning and Problem Solving

R

Teddy is given one  for Christmas.

Eva is given two 



Teddy

I got more than you did because my number is bigger.

I got more than you did because I got two notes.



Eva

Who is correct?

Explain your reasoning.

Both Teddy and Eva are wrong because they both have £10.

Eva has two £5 notes, which makes £10, and Teddy has a £10 note.

Jack, Rosie and Amir each have some money in their pockets.
Jack and Amir both have coins and Rosie has a note.



I have more money than Rosie.

Amir 

I have less money than Rosie.



Jack 

What note could Rosie have?

Rosie could have a £5 note.
She could not have a £10 or a £20 note because they are larger than Amir's amount.

Always, sometimes, never

Money in notes is worth more than money in coins.

Sometimes - if you have £6 in coins it is worth more than a £5 note.
However you could also have less than £5 in coins.

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Count Money - Pence

Notes and Guidance

This block introduces the £ and p symbols for the first time.

Children will count in 1 p, 2 p, 5 p and 10 p coins. Children can also use related facts to count in 20 p coins.

Children do not convert between pounds and pence, therefore children will need to recognise the 50 p coin but they will not count up in 50 p coins.

Mathematical Talk

What is different about the coins you have counted?

Is the group with the most coins always the biggest amount? Why?

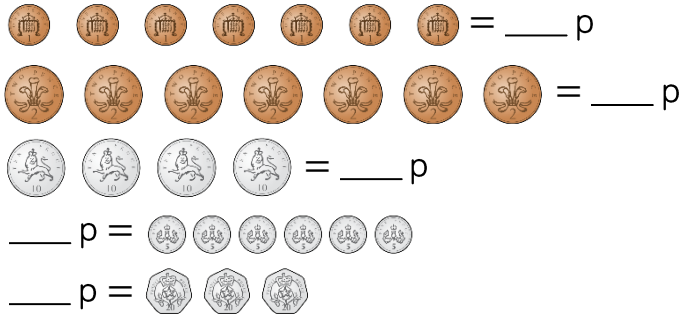
What do you notice about the totals?

Are silver coins always worth more than copper coins?

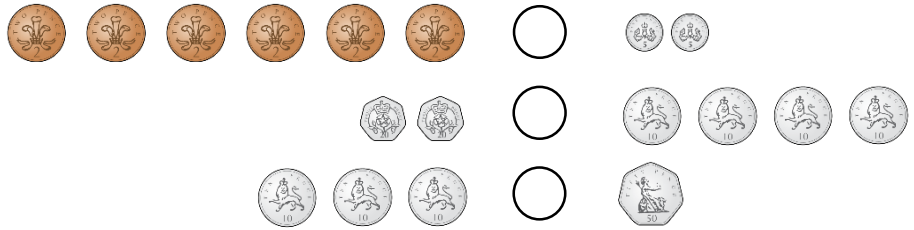
What different ways can you count the coins?
Which is the quickest way?

Varied Fluency

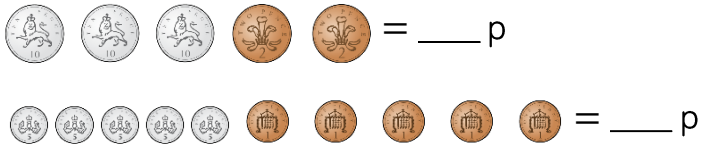
Count the money.



Use <, > or = to compare the money.



Count the money.



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Count Money - Pence

Reasoning and Problem Solving

Jack selects four of these coins.



He can use the coins more than once.

What total could he make?

What is the lowest total?

What is the greatest total?

Example answers:

20 p, 10 p, 10 p and 1 p makes 41 p.

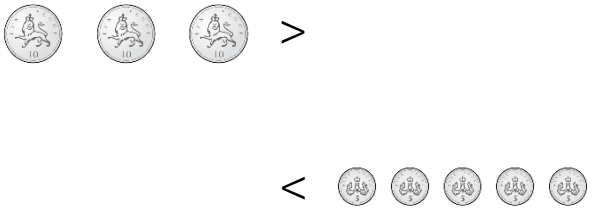
5 p, 5 p, 5 p and 5 p makes 20 p.

1 p, 20 p, 5 p and 2 p makes 28 p.

The lowest total would be 1 p, 1 p, 1 p and 1 p, makes 4 p.

The greatest total would be 20 p, 20 p, 20 p and 20 p makes 80 p.

Draw coins to make the statements correct.



For the first one, any answer showing less than 30 p on the right is correct. E.g. two 10 p coins.

For the second one, any answer showing less than 25 p on the left. E.g. three 2 p coins.

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Count Money - Pounds

Notes and Guidance

Children will continue counting but this time it will be in pounds, not pence. The £ symbol will be introduced.
Children must be aware that both coins and notes are used to represent amounts in pounds.
Children will count in £1, £2, £5, £10 and £20s.
In this year group, children work within 100, therefore they will not count in £50s.

Mathematical Talk

Do the notes have a greater value than the coins?

Which is the hardest to count? Which is the easiest? Why?

What do you notice about the amounts?

Does it matter which side the equals sign is?

Can you find the total in a different way?

Varied Fluency

Count the money.

 = £____

£____ = 

 = £____

£____ = 

Complete the bar models.





Match the money to the correct total.



£25



£60



£10

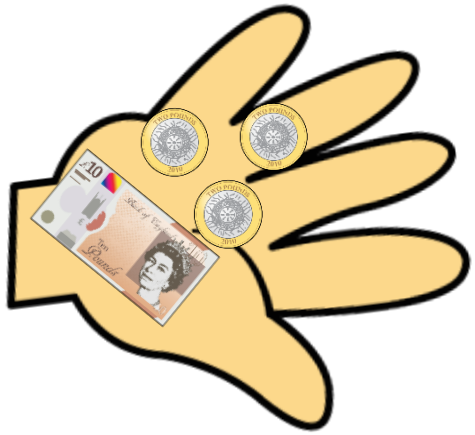
Which is the odd one out? Explain why.

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Count Money - Pounds

Reasoning and Problem Solving

Ron thinks he has £13



Is he correct?
Explain your answer.

No, because three £2 coins make £6

£10 and £6 is equal to £16

He has mistaken his £2 coins for £1 coins.

Explain the mistake.

£2, £4, £6, £7, £8, £10

£7 is the mistake. It is an odd number. The 2 times table are all even.

When counting in £2s, we would say

£2, £4, £6, £8, £10

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Count Money – Notes & Coins

Notes and Guidance

In this step, children will build on counting by bringing pounds and pence together.

Decimal notation is not used until KS2 therefore children will write the total using 'and' e.g. £5 and 30 p rather than £5.30

Children will not count across £1. They will count the pounds and pence separately before putting them together.

Mathematical Talk

How did you work out the total amount of money?

What strategy did you use to count the money when there is pounds and pence?

Explain what to do when the pounds and pence are mixed up.

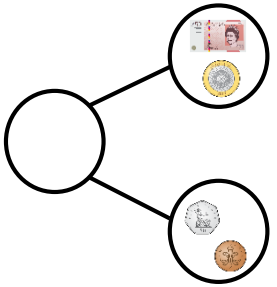
Varied Fluency

How much money is there altogether?



There is £____ and ____p.

Complete the part-whole model.



What's the same and what's different about the parts?

Fill in the gaps to make the statements correct.

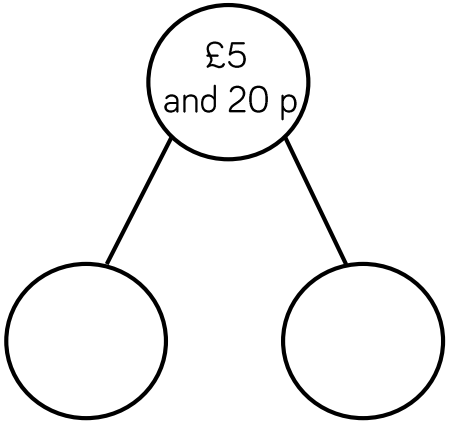
- £10 + £5 + 50 p = £_____ and _____p
- £20 + £2 + 10 p + 10 p + 2 p = £_____ and _____p
- £5 + £___ + 50 p + 20 p + 20 p + 1 p = £10 and ____p

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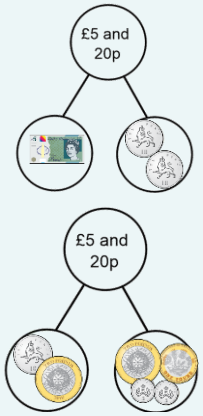
Count Money – Notes & Coins

Reasoning and Problem Solving

How many ways can you complete the part-whole model by drawing money?



Example answers:



Mo has the following coins.



He thinks he has 51 p.

Explain his mistake.

Mo thinks the 5 p is a 50 p coin. He has 6 p.
Alternatively, he has combined the 5 and 1 from each coin.

Here are some coins and a note.



Amir says, "There is 10 p".

Dexter says, "There is £10".

Are either of them correct?

Explain why.

No, Amir and Dexter have taken the digits 2, 2, 5 and 1 and added them together.

The coins are a mix of pounds and pence so need to be counted separately.

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Select Money

Notes and Guidance

Children select coins to make an amount, from a set of coins given to them. They will use these practically, draw them and write the abstract amounts.
They will continue to use both pounds and pence to embed previous learning.
Children are continuing to work on recognising money by selecting the correct coins or notes from a wide range.

Mathematical Talk

How do you know you have made 56 p?
Is your answer the same as your partner?
Can you find any other ways to make this amount?

Does it matter if you say pence or pounds first?

Does this change the total?

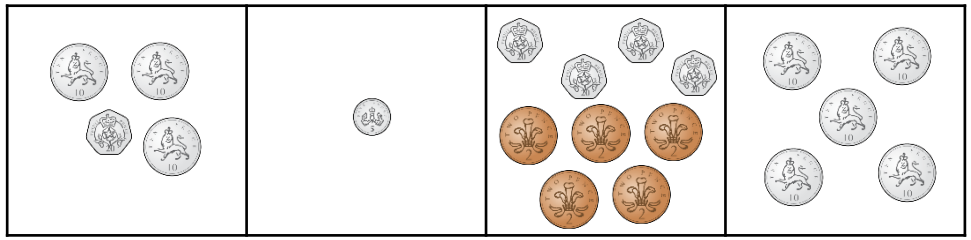
Can you show this amount in a different way?

Varied Fluency

- Circle 56 p.



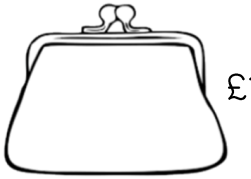
- Which does **not** show 50 p?



- Draw money on the purses to match the amounts.



£21 and 32 p



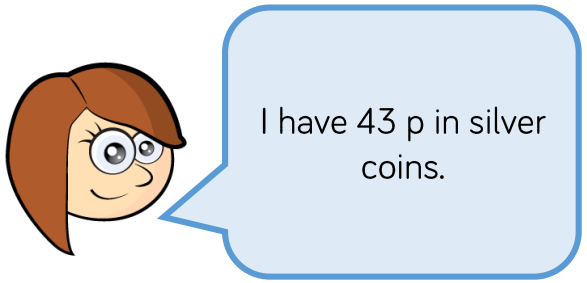
£13 and 40 p

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Select Money

Reasoning and Problem Solving

Rosie says,



Do you agree?

Explain why.

No, because 3 pence can only be made with copper coins.

Annie and Ron both claim to have 90 p.

Annie has 3 coins and Ron has 4 coins.

Could they be correct?

Which coins could they have?

Yes, they can because:
Annie = 50 p, 20 p, 20 p.
Ron = 50 p, 20 p, 10 p, 10 p.

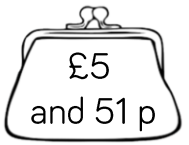
Use the money to fill the purses.

You can only use each coin or note once.

Cross them out once you have used them.







Example answer:



£10 and 15 p



£5 and 51 p

Circle the odd one out.

23 p = 20 p, 2 p, 1 p
25 p = 20 p, 5 p
28 p = 20 p, 8 p

Explain your answer.

28 p = 20 p, 8 p is because if you are using coins there is not an 8 p coin. Children may give other answers.

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Make the Same Amount

Notes and Guidance

Children explore the different ways of making the same amount. As before, they will not count pence over into pounds.

Examples need to be modelled where pounds and pence are together but children need to continue to be encouraged to count the pounds and pence separately.

Mathematical Talk

Can the same amount be made using different coins?
How did you compare the amounts?
How is your way different to a partner?

Can you swap a coin/note for others and still make the same amount?

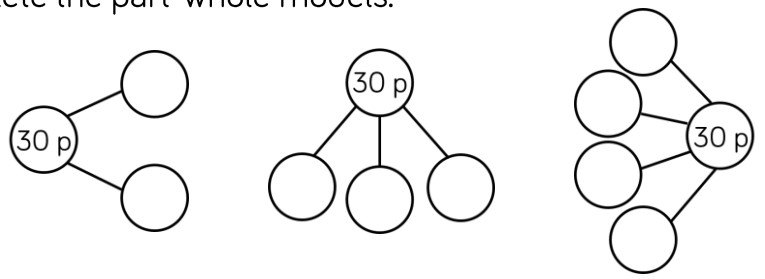
What is the smallest amount of coins you can use to make ___?

Varied Fluency

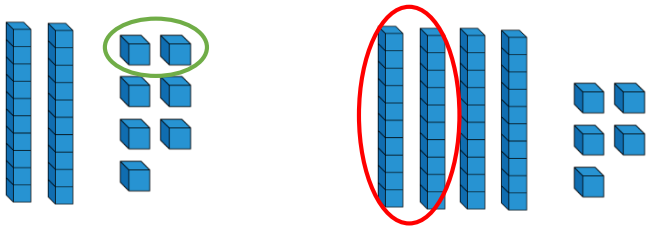
- Match the amounts.



- Complete the part-whole models.



- The Base 10 represents money. What coin is represented by each circle?



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Make the Same Amount

Reasoning and Problem Solving

Make 50 p three ways using the coins below.

You can use the coins more than once.



Example answers:

20 p, 20 p, 10 p

10 p, 10 p, 10 p, 10 p, 5 p, 5 p

1 p (50 times)

How many ways can you make 10 p using only copper coins?

Did you use a strategy?

Example answers:

2 p, 2 p, 2 p, 2 p, 2 p

2 p, 2 p, 2 p, 2 p, 1 p, 1 p

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Compare Money

Notes and Guidance

Children compare two different values in either pounds or pence.
Children will see examples with both pounds and pence, but they will only focus on one of these - the other must be the same e.g. £3 and 10 p > £2 and 10 p where 10 p is the constant.
Children recap comparing vocabulary such as greater/less than and use the inequality symbols.

Mathematical Talk

What do you notice about the amounts you have compared?

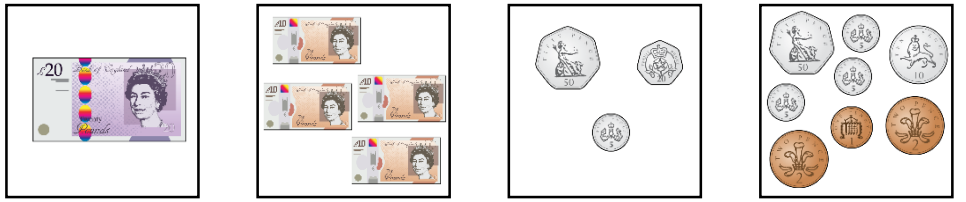
What's the same? What's different?

How do you know who has the most, when they both have 64?

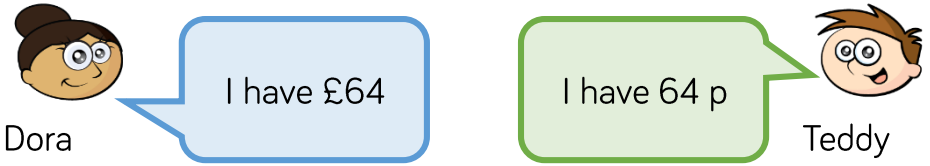
Can you add a value that will go in between the greatest and the least?

Varied Fluency

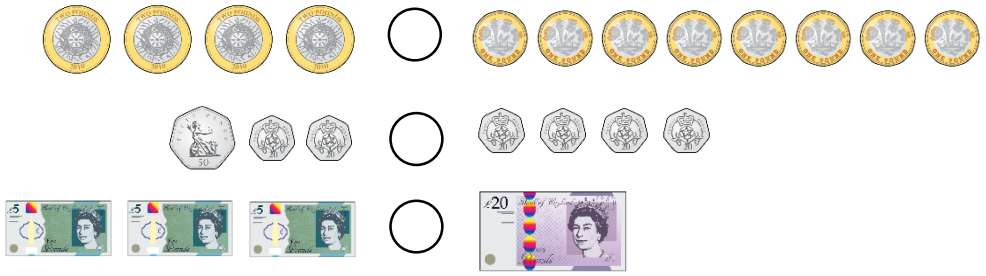
- Circle the box with the greatest amount.



- Who has the most? Who has the least? How do you know?



- Use <, > or = to compare the amounts.



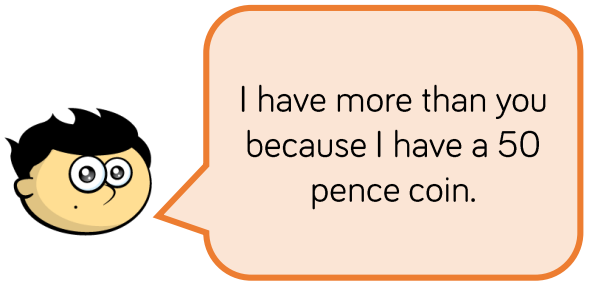
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Compare Money

Reasoning and Problem Solving

Annie has three coins in her hand.

Jack says,



Is he correct?

Explain why.

It depends on the coins Annie has.

Children explore and show e.g.

20 p, 20 p, 20 p > 50 p

5 p, 2 p, 2 p < 50 p

True or False?

5 copper coins can be worth more than 1 silver coin.

Only true when 5 p is the silver coin.

Children should explore different true and false answers.

Four 5 pence coins are worth more than two 10 pence coins.



Do you agree? Explain why.

No, they are equal to each other. They both make 20 p.

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Find the Total

Notes and Guidance

Children will build on their knowledge of addition to add money including:

- 2-digit and 2-digit
- 2-digit and ones
- 2-digit and tens
- 3-single digits

Children will be encouraged to use different methods to add the amounts of money, such as count on, partitioning and regrouping.

Mathematical Talk

How did you find the missing amounts? Share your strategies with a friend.
Was your method different to a friend?

What is the most efficient method? Why?

Can you write a worded question for a friend?

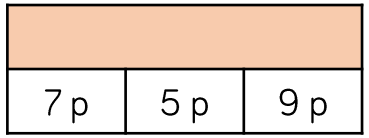
What was the greatest amount you found?

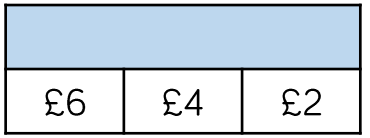
Varied Fluency

Complete the table.

Pounds	Pence	Total
£4	25 p	£____ and ____p
£2		£2 and 40 p
	65 p	£20 and 65 pence
		£15 and 20 p
	55 pence	

Complete the bar models.

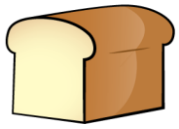




Amir buys bread and eggs.



49 p



30 p

How much does he spend?

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Find the Total

Reasoning and Problem Solving

Dexter has these coins and notes.



He makes an amount greater than £20 but less than £30

Draw the money he could have used.
You can use each coin or note more than once.

How many different ways can you find?

Possible answers:

£10, £10 and £5 makes £25

£10, £5, £5, £2 makes £22

Etc.

Here is a shopping list.

Item	Price
Rubber	20 p
Ruler	18 p
Pencil	32 p
Crayon	27 p
Pen	45 p
Glue	36 p

- I spend exactly 50 p. Which two items did I buy?
- I bought two of the same item and it cost me 90 p. What was the item?
- Choose two items. How many different amounts can you make?
- What is the closest you can get to 65 p?

The ruler and the pencil as 18 p and 32 p makes 50 p.

Two pens as 45 p and 45 p makes 90 p.

Children to explore the totals that can be made by adding two items together.

The rubber and the pen would cost 65 p as 20 p and 45 p sum to 65 p.

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Find the Difference

Notes and Guidance

Children expand their knowledge of addition and subtraction strategies by specifically finding the difference between two amounts.

In this step, children should see both counting on and counting back being modelled to them.
They need to discuss which is the most efficient for different questions.

Mathematical Talk

Which costs more? How do you know?
How can you work out how much more?

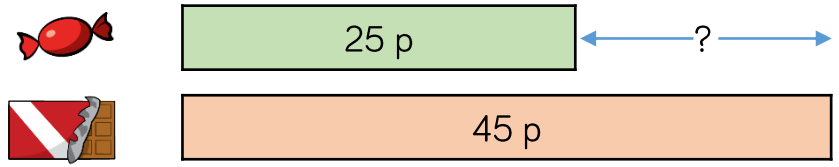
What's the difference?

How much less?/How many fewer?

What method did you use to work this out?

Varied Fluency

- Work out the difference between the cost of a bag of sweets and a bar of chocolate.



- Find the difference between the amounts of money Amir and Mo have.



Amir Mo

- Alex has £2 and 15 p.
Rosie has £2 and 40 p.

How much more money does Rosie have than Alex?

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Find the Difference

Reasoning and Problem Solving



I have 57 p.

Whitney

I have 2 silver coins and 1 bronze coin.



Mo

What could Mo have?

Work out the difference between the amounts.

How many different answers can you find?

Example answers:

Mo could have more by:

- 50 p, 2 0p, 1 p
- 50 p, 20 p, 2 p

Mo could have the same by:

- 50 p, 5 p, 2 p

Mo could have less by:

- 5 p, 5 p, 1 p
- 20 p, 10 p, 2 p

Jack has 2 p.

Eva has 10 p.

Both of them have a 2 p coin.

What **other** coins could Eva have?

4 × 2 p

3 × 2 p and 2 × 1 p

2 × 2 p and 4 × 1 p

1 × 2 p and 6 × 1 p

8 × 1 p

5 p and 2 p and 1 p

5 p and 3 × 1 p

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Find Change

Notes and Guidance

Children build on their subtraction skills by finding change from a given amount. They need to identify amounts from the coins given, write the calculations and choose efficient methods.

In this step, children will be introduced to converting £1 to 100 p to be able to subtract from £1. This links to their number bond knowledge to 100.

Mathematical Talk

How much does Dora have? How do you know?
Can you write a calculation to work out how much she will have left?

Why is it important to use the £ or p symbol?

What strategy did you use to find the change?
Did you use concrete objects to help?

Varied Fluency

- Dora has these coins.



She spends 53 p.
What money will she have left? What coins could it be?

- Write the calculation and find the amount of change.



32 p



___ – ___ = ___

- Ron spends 65 p in the shop.
He pays with a £1 coin.

How much change will he receive?

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Find Change

Reasoning and Problem Solving

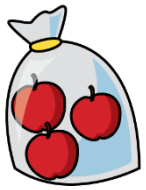
I have 20 p.

My change is more than 5 p but less than 10 p.

What could I have bought?



Sweet: 7 p



Apples: 18 p



Chocolate: 12 p



Banana: 4 p

Example answers:

Chocolate bar or a sweet and banana.

I paid for my shopping with one coin.

Here is my change.



What could I have paid with and how much would the item have been?

Could have paid with a 20 p coin and it would have cost 3 p.

Could have paid with a 50 p coin and it would have cost 33 p.

Could have paid with a £1 coin and it would have cost 83 p.

Could have paid with a £2 coin and it would have cost £1 and 83 p.

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Two-step Problems

Notes and Guidance

Children draw together all of the skills they have used in this block and consolidate their previous addition and subtraction learning.
Children may need some scaffolding to see the different steps.
Bar modelling is really useful to see the parts and wholes, and supports children in choosing the correct calculation.

Mathematical Talk

Where does the £33 go in the bar model?
How can you find the total?

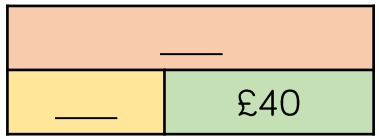
Here is a one step problem. Can you think of a second step?

Can you write your own two step word problem?

Did you use a concrete or pictorial representation to help you?

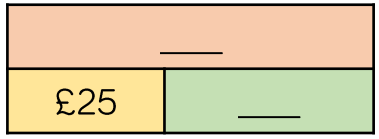
Varied Fluency

Rosie has £33 in her money bank, and gets £40 more.
Fill in the bar model and write a calculation to show her total.



___ + ___ = ___

She then buys a top for £25. Complete the bar model and write a calculation to show what she has left.



___ – ___ = ___

Amir has these coins.



He spends 54 p. How much does he have left?

A scarf is £12 and a bag is £25
Whitney buys one of each and pays with a £50 note.
How much change will she receive?

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Two-step Problems

Reasoning and Problem Solving

Ghost Train: 90 p

Annie finds a 20 p coin.

She puts it with her other three 20p coins.

Does Annie have enough to ride the ghost train?

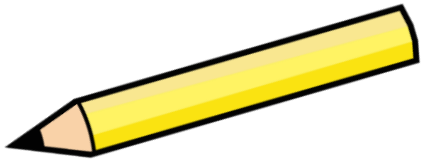
Explain why.

No, because she only has 80 p.

She would need 10 p more.

90 p > 80 p

Alex has 90 pence.
She bought a rubber for 30 pence and wants to buy a pencil.



Pencil: 70 p

The shopkeeper will not sell her the pencil.
Explain why.

90 p – 30 p = 60 p

70 p > 60 p

She does not have enough money to buy the pencil.

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Autumn - Block 4

Multiplication & Division

Overview

Small Steps

Make equal groups	R
Add equal groups	R
Make arrays	R

Notes for 2020/21

Use this time to recap the basics of multiplication. Year 2 multiplication will be covered in the Spring term.

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Making Equal Groups

Notes and Guidance

Children begin by using stories which link to pictures and concrete manipulatives to explore making equal groups and write statements such as 'there are ___ groups of ___.' They will recognise and explain how they know when they are equal or not. Children see equal groups that are arranged differently so they understand that the groups look different but can still be equal in number.
At this stage children do not explore multiplication formally.

Mathematical Talk

How do I know that the groups are equal? What does equal mean?

How many pencils are there in each pot? How can I complete the sentence to describe the groups?

What's the same and what's different?

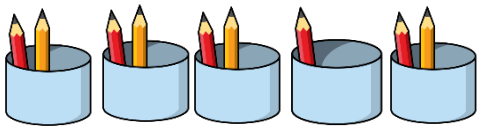
Are Josh's groups equal or unequal? How can we make them equal?

Varied Fluency

R

Are the groups equal or unequal? Write a label for each.





Complete the sentences



There are ___ groups of ___ pencils.



There are ___ groups of ___ flowers.

Josh is drawing equal groups of 3



Complete his drawing.

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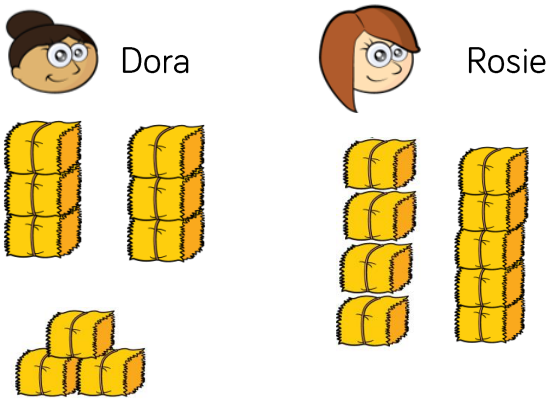
Making Equal Groups

Reasoning and Problem Solving

R

Dora and Rosie are making hay bundles.

Who has made equal groups?



Explain how you know.

Possible answer:
Dora has made equal groups because she has 3 groups of 3 hay bundles.

Rosie has two unequal groups.

Use concrete materials or pictures to complete the questions.

Alex has 4 equal groups.
Show me what Alex's groups could look like.

Whitney has 3 unequal groups.
Show me what Whitney's groups could look like.

Children will show 4 groups where there are the same amount in each group for Alex and 3 groups that are unequal for Whitney.

Encourage children to do this in more than one way.

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Add Equal Groups

Notes and Guidance

Children use equal groups to find a total. They focus on counting equal groups of 2, 5 and 10 and explore this within 50.
Children could begin by linking this to real life, for example animal legs, wheels, flowers in vases etc.
Stem sentences alongside number sentences can help children link the calculation with the situation. Ensure children have the opportunity to say their sentences aloud.

Mathematical Talk

How many apples are there in each bag?
Do all of the bags have an equal number of apples?
How many equal groups can you see?

How can we represent this with counters/cubes/on a number line/in a number sentence etc?

What other equipment could you use to represent your pattern? What's the same? What's different?

Which is more, 3 groups of 10 or 4 groups of 5? Prove why.

Varied Fluency

R

- How many wheels altogether?



2 + 2 + 2 + 2 + 2 =

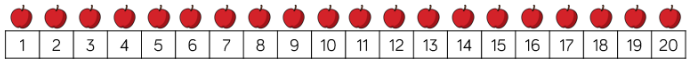
How many fingers altogether?



5 + 5 + 5 =

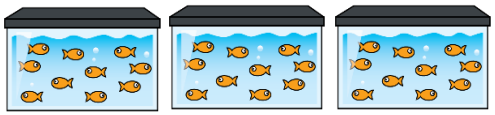
- How many apples are there? Complete the sentences.





5 + 5 + 5 + 5 = ____
There are ____ apples.
There are ____ groups of ____ apples which is equal to ___

- How many fish are there?
Complete the sentences.



___ + ___ + ___ = ___
There are ____ fish.

Can you show this using ten frames?

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Add Equal Groups

Reasoning and Problem Solving

R

Eva and Whitney are making equal groups of bread rolls.





Eva

We need one more group to make 40

We need 10 more rolls to make 40



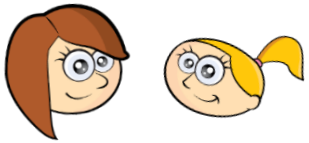
Whitney

Who do you agree with? Explain why.

Possible answer:
I agree with both.

They are counting in groups of 10 so they need one more group of 10

Rosie and Eva have equal groups of either 2, 5 or 10



Each of their totals is less than 40

Rosie has 5 equal groups.
Eva has 3 equal groups.

Eva's total is more than Rosie's total.

What could they be counting in?

Use equipment to help you.

Possible answers:
Rosie: 2 + 2 + 2 + 2 + 2 = 10
Eva: 5 + 5 + 5 = 15

Rosie: 5 + 5 + 5 + 5 + 5 = 25
Eva: 10 + 10 + 10 = 30

Rosie: 2 + 2 + 2 + 2 + 2= 10
Eva: 10 + 10 + 10 = 30

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Make Arrays

Notes and Guidance

Children begin to make arrays by making equal groups and building them up in columns or rows.

They use a range of concrete and pictorial representations alongside sentence stems to support their understanding.

Children also explore arrays built incorrectly and recognise the importance of columns and rows.

Mathematical Talk

How many equal groups do I have? How many in each group?
Can I represent my apples with counters?

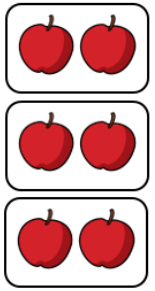
What is the difference between columns and rows?
How many counters in each row? How many counters in each column?

How can I record my array with a number sentence?

Varied Fluency

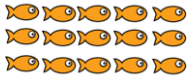
R

Build an array with counters to represent the apples.
Complete the sentences.



There are ____ apples in each row.
There are ____ rows.
____ + ____ + ____ = ____
There are ____ apples altogether.

Complete the table.

Array	Description - columns	Description - rows	Totals
	5 columns 2 cookies in each column	2 rows 5 cookies in each row	2 + 2 + 2 + 2 + 2 = 10 5 + 5 = 10
	___ columns ___ donuts in each column	___ rows ___ donuts in each row	
	___ columns ___ fish in each column	___ rows ___ fish in each row	
	3 columns 5 cupcakes in each column	5 rows 3 cupcakes in each row	

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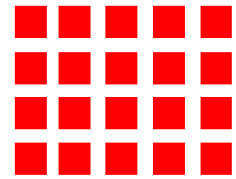
Make Arrays

Reasoning and Problem Solving

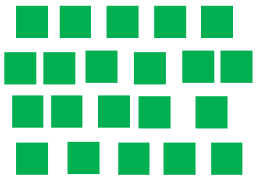
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Amir and Whitney are making arrays.





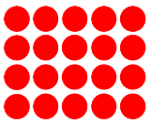




Who has made a mistake? Explain why.

Possible answer:
Whitney has made a mistake because her array is not in columns. There are an unequal amount of squares in each row.

Teddy and Alex are writing number sentences to describe the array.







Who do you agree with? Explain why.

Possible answer:
They are both right. Teddy has counted the columns. Alex has counted the rows.

Eva begins to make an array with 40 counters.
She has finished her first row and her first column.
Complete her array.



Write two different number sentences to describe the finished array.

Possible answer:
Array showing 10 + 10 + 10 + 10 = 40

Or

4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 = 40

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