Worksheet 8

Name _____ **Date** _____

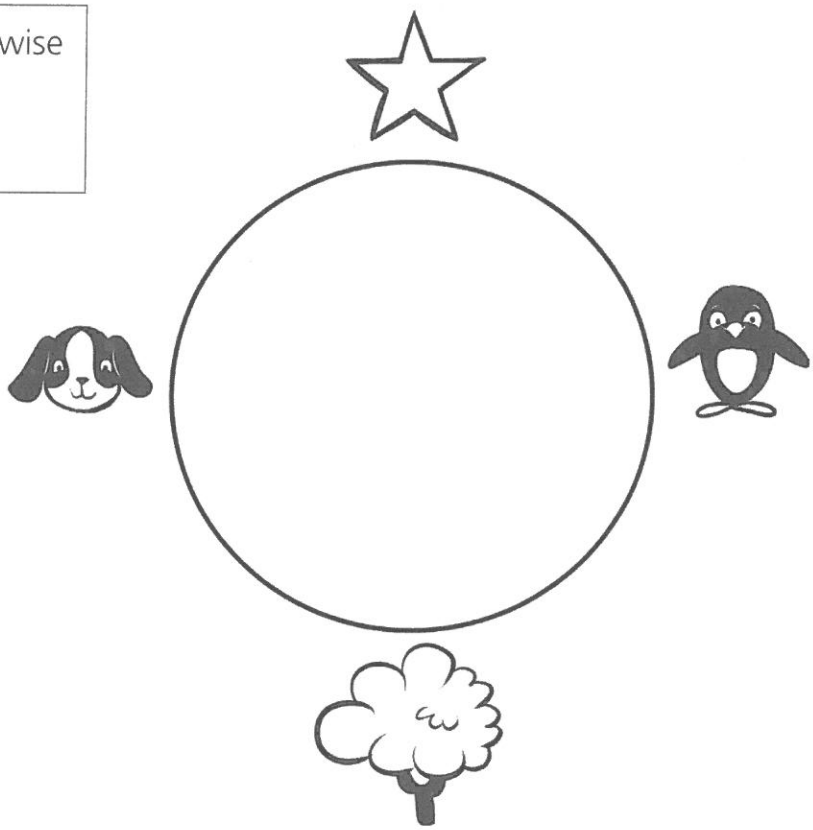
Turns

Start in the middle of the circle facing the star.

How many turns would you take to face the different items around the circle?

Draw a line to link the instruction to the correct item.

Quarter turn anticlockwise
Half turn clockwise
Three-quarter turn anticlockwise



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Strand: Number

DAY 1

Sub-strand: Counting in steps and multiples

TEACH

ACTIVITY 1: Finding ten more using a 100 square

- Give each child a 100 square. Explain how the square works. Say: *Moving right along a line the numbers go up in ones. We can use a 100 square to count up and down in* ***tens***.
- Ask the children to circle 24 and then to circle all of the numbers in that column. Ask them to say the numbers out loud and remind them that they are counting in tens.

WATCH OUT: Observe how the children manage the counting in tens. Can they do it from memory or are they looking at the numbers each time?

- Repeat counting in tens, but with other starting numbers (e.g. 16, 4, 27).

TIP: Emphasise to the children that they are saying the number that is **ten more** each time they move their finger *down* the column.

- Continue until the children are confident.

ACTIVITY 2: Find ten less using a 100 square

- Remind the children that, as you move *down* the columns on the 100 square, the numbers go **up by ten**. Also, as you move *up* the columns on the 100 square, the numbers go **down by ten**.
- Ask the children to find the number 23 and put a circle round it. Ask them: *How can we find the number that is* ***ten less*** *than 23?* Take the children's responses and establish with them that they could look at the number *above* 23 on the 100 square to count down ten.
- Repeat with other numbers (e.g. 76, 45, 63, 12, 38).

WATCH OUT: The children may find it hard to write the numbers without looking at them on the 100 square to copy. This is fine as they will continue to work on place value through the next lessons.

OBJECTIVES

- Count in steps of two, three and five from zero
- Count in tens from any number, forwards or backwards
- Identify ten more or ten less than any given number

Rising Stars Progression Framework: 2.1.a.1, 2.1.a.2, 2.1.a.3

RESOURCES

- Activity 1: Each child needs: a laminated 100 square, wipe clean pens
- Activity 2: Each child needs: a laminated 100 square, wipe clean pens

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Strand: Number

DAY 2

Sub-strand: Counting in steps and multiples

TEACH

ACTIVITY 1: Using cubes to count in twos

- Give each child 20 cubes and a 0 to 20 number track.
- Ask the children to group the cubes into groups of two. Each time they count a group they should put a circle around that number on the number track. e.g. *1, 2, (circle the number 2), 3, 4 (circle the number 4).*

WATCH OUT: If the children have circled the wrong numbers on the number track they may also have trouble identifying the numbers in the multiplication table for two.

- Once the children have circled all of the numbers on the number track, ask: *Do these numbers appear when we count in twos: 4, 9, 16, 17, 18, 20? How do you know?* They could say that they circled them on their number track or they may know that all the numbers in the count are even. They could even prove their answer using a multiplication fact for two, e.g. $8 = 2 \times 4$.
- Highlight that the numbers in the count are all **multiples of two**.

ACTIVITY 2: Using a number track to count in twos

- Look at the first number track from Worksheet 1. Ask: *What is the first number on the number track?* (2) Tell the children: *Hold this number in your head.*
- Now ask the children to count on from 2 to the next number (4). As they count (3, 4) they can put a button or other manipulative in front of them.
- Ask: *How many buttons do you have?* (Two) *So four must be **two more** than two. What will the next number in the sequence be? What will be two more than four?* Count two more with the children. Ask the children to keep their buttons in front of them to help when counting in twos.
- The children then repeat the process you have taught them to fill in the missing numbers in the first three number tracks on Worksheet 1.
- Next review their answers. *Do they have the same answers? Did they use their buttons to help them? Have they noticed any other patterns?*
- Then model finding two more or less than a number that is not a multiple of two. *To find two more than 17 we count on two. We could use our buttons to help us. 17, 18, 19. 19 is two more than 17.*
- Complete the third number track as a group.
- Ask them to fill in the remaining number tracks on Worksheet 1.

TIP: Encourage the children to use the buttons to help only if they are struggling; children confident counting in twos mentally should be encouraged to do so.

OBJECTIVES

- Count in steps of two, three and five from zero
- Count in tens from any number, forwards or backwards
- Identify ten more or ten less than any given number

Rising Stars Progression Framework: 2.1.a.1, 2.1.a.2, 2.1.a.3

RESOURCES

- Activity 1: Each child needs : 20 cubes, a 1 to 20 number track
- Activity 2: Each child needs: Worksheet 1; a pencil; a box of manipulative counting apparatus such as buttons or dinosaurs

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Worksheet 1

Name _____ Date _____

Number tracks in 2s

Complete the number tracks. Each box should have:

- a number that is **2 more** on the right
- a number that is **2 less** on the left.

2	4			10		14

6		10			16	

8			14			20

15	17		21			27

35		39		43		47

49	51			57		61

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Strand: Number

DAY 3

Sub-strand: Counting in steps and multiples

TEACH

ACTIVITY 1: Using cubes to count in fives

- Give each child 20 cubes and a 0 to 20 number track.
- Ask the children to group the cubes into groups of five and then to count the groups. Each time they count a group they should put a circle around that number on the number track, e.g. *1, 2, 3, 4, 5 (circle the number 5), 6, 7, 8, 9, 10 (circle the number 10),* etc.
- Once the children have correctly circled the numbers on the number track, ask: *Do these numbers appear when we count in fives: 6, 7, 9, 15, 16, 17, 18, 20? How do you know?* (They could say that they circled them on their number track or they may know that all the numbers in the count end with a zero or five. They could even prove their answer using a multiplication fact for five, e.g. $15 = 5 \times 3$.)
- Highlight that the numbers in the count are all **multiples of five**.

TIP: If the children are secure in this work, challenge them to find out if 25 is in the multiplication table for five. Ask: *How could we find out? What could we do?* The children may suggest extending their number track to have 25 on it so they can repeat the process from above.

ACTIVITY 2: Using a number track to count in fives

- Give each child a copy of Worksheet 2 and a pencil. Tell them that each box has a number that is either **five more or five less** than the numbers next to it.
- Look at the first number (10). Model how to fill in the missing numbers: *We must count in fives to find five more. 10, 15. The missing number is 15.*
- The children should complete the first two number tracks individually.
- Then model finding five more or less than a number that is not a multiple of five. *To find five more than 61 we count on five. We could use a number track to help us. 62, 63, 64, 65, 66. 66 is five more than 61.*
- Complete the third number track as a group.
- The children should complete the remaining number tracks individually.

OBJECTIVES

- Count in steps of two, three and five from zero
- Count in tens from any number, forwards or backwards
- Identify ten more or ten less than any given number

Rising Stars Progression Framework: 2.1.a.1, 2.1.a.2, 2.1.a.3

RESOURCES

- Activities 1 and 2: Each child needs: a paper number track to 20, a pencil, access to 20 cubes or other manipulative resources
- Activity 2: Worksheet 2; pencil

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Worksheet 2

Name _____ Date _____

Number tracks in 5s

Complete the number tracks. Each box should have:

- a number that is **5 more** on the right
- a number that is **5 less** on the left.

10		20			35	
15	20		30			45
61		71			86	91
58			73		83	
24		34			49	
	47			62		

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Strand: Number

DAY 4

Sub-strand: Counting in steps and multiples

TEACH

ACTIVITY 1: Using cubes to count in threes

- Give each child 20 cubes and a paper number track to 20.
- Ask the children to group the cubes into groups of three. Tell them that there will be some spare.
- Ask the children to count the groups of three. Each time they count a group they should put a circle around that number on the number track, e.g. *1, 2, 3 (circle the number 3), 4, 5, 6 (circle the number 6),* etc.

WATCH OUT: If the children have circled the wrong numbers on the number track they will have trouble identifying the numbers in the multiplication table for three.

- Once the children have correctly circled the numbers on the number track, ask: *Do these numbers appear when we count in threes: 4, 9, 16, 23, 33? How do you know?* (They could say that they circled them on their number track. They could even prove their answer using a multiplication fact for three, e.g. $15 = 3 \times 5$.)
- Highlight that the numbers in the count are all **multiples of three**.

ACTIVITY 2: Practising counting in threes

- Tell the children that you'll pull a number from the deck of cards. They will need to count that many groups of three using counters.
- Pull a card from the deck and model making that many groups of three on the table from counters. Then count the total number of counters.
- Repeat with other numbers, this time asking the children to help you find the answers.

WATCH OUT: Watch the children as they count out the counters – are the groups all even? Have they counted out the right number of groups? Are they counting the total accurately?

OBJECTIVES

- Count in steps of two, three and five from zero
- Count in tens from any number, forwards or backwards
- Identify ten more or ten less than any given number

Rising Stars Progression Framework: 2.1.a.1, 2.1.a.2, 2.1.a.3

RESOURCES

- Activity 1: Each child needs a paper number track to 20, a pencil, access to 20 cubes or other manipulative resources
- Activity 2: a set of number cards from 1 to 10; at least 30 counters

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Strand: Number

DAY 5

Sub-strand: Counting in steps and multiples

ASSESS

ASSESSMENT ACTIVITY

- The purpose of the assessment is to check what each child can do independently, noting down any difficulties and misconceptions. The adult will need to watch carefully what the children do, any strategies used and confidence levels.
- Start by handing out copies of Worksheet 3. Explain to the children that they need to fill in the boxes on either side of the middle number by writing down the number that is more than or less than the number in the middle. They will need to look carefully to see whether the need to find two, three, five or ten more or less.
- Allow the children access to cubes to help them work out the answers, if they would like.

WATCH OUT: Observe the children as they work out the answers and make a note of any strategies they use.

- Now give each child a 100 square and a coloured crayon. Ask them to find all the multiples of five. The children then colour in all the numbers they say when they count in fives from zero.
- Next, ask them to repeat the process with other coloured crayons for multiples of two.
- Finally, ask them to repeat the process with other coloured crayons for multiples of three.

TIP: Some of the numbers will need to be coloured in for all of the tables. In this case the children could circle the box with the number in/underline the number, etc.

WATCH OUT: As the children are colouring the numbers, note down any strategies they use to work out the answers.

EVIDENCING SUCCESS

Meeting expectations:

- The child can count up in tens from 43.
- The child can identify the numbers 96 and 116 as being ten more and less than 106.
- The child can continue the sequence 3, 6, 9 ... to determine if the number 41 is in it.

OBJECTIVES

- Count in steps of two, three and five from zero
- Count in tens from any number, forwards or backwards
- Identify ten more or ten less than any given number

Rising Stars Progression Framework: 2.1.a.1, 2.1.a.2, 2.1.a.3

RESOURCES

- Each child needs: Worksheet 3, a pencil, a 100 square, access to coloured crayons and cubes

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Worksheet 3

Name _____ Date _____

Finding more and less

Complete the table. Each number should have:

- a number that is **2**, **3**, **5** or **10 more** on the right
- a number that is **2**, **3**, **5** or **10 less** on the left.

10 less	**Number**	**10 more**
	5	
	106	
2 more	**Number**	**2 less**
	12	
	29	
5 more	**Number**	**5 less**
	15	
	42	
3 more	**Number**	**3 less**
	6	
	44	

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Strand: Number

DAY 1

Sub-strand: Representing numbers

TEACH

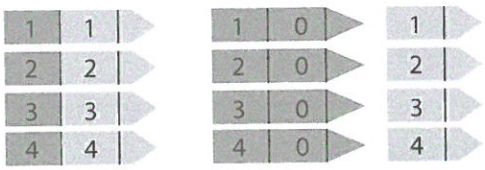
ACTIVITY 1: Using cubes to understand tens and ones

- Ask the children to take a specified number of cubes, e.g. 23.
- Then ask the children to make as many sticks of ten cubes as they can. Ask: *How many cubes do you have left over?* (Using the example of 23, there would be three cubes left over.)
- Write the number of tens and ones in a place-value grid. Reinforce the language of **place value:** *There are two **tens** and **three** ones. We combine these to make 23.*
- Repeat with different two-digit numbers (e.g. 56, 13, 33).

TIP: The children need to be secure on the value of each numeral and so you should ensure they can recognise which is the tens and which is the ones. Place cubes under each numeral to show this to any children struggling.

ACTIVITY 2: Using arrow cards to understand tens and ones

- Introduce the place-value (arrow) cards and explain how to use them – you make the number by stacking the ones card on top of the tens card. You can then partition the number by pulling the cards apart.



- Make a two-digit number (e.g. 65) with the arrow cards. Ask: *Which number have I made? What numbers are in it?*
- Ask the children to copy the number using their own arrow cards.
- Check understanding by asking: *How many **tens** are in the number? How many **ones**? How do you know?* Encourage the children to pull apart their arrow cards to help them.
- Repeat with other numbers: 34, 92, 64.

OBJECTIVES

- Recognise the place value of each digit in a two-digit number (tens, ones)
- Read and write numbers to at least 100 in numerals and words
- Identify, represent and estimate numbers using different representations, including the number track
- Use place value and number facts to solve problems

Rising Stars Progression Framework: 2.1.b.1, 2.1.b.2, 2.1.b.3, 2.1.d.1

RESOURCES

- Activity 1: Big box of multi-link cubes; whiteboard and pens
- Activity 2: Each child needs: one set of arrow cards, a whiteboard and pen

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Strand: Number

DAY 2

TEACH

Sub-strand: Representing numbers

ACTIVITY 1: Partitioning sticks of cubes in different ways

- Give each of the children a stick of 20 multi-link cubes, a whiteboard and a pen. Ask them to hold the stick of cubes in both hands and then snap the stick (at any point). Ask: *How many cubes do you now have in each part?*
- Ask the children to write these two numbers down on their whiteboard as 20 = ... + ...

WATCH OUT: The 20 being at the beginning of the calculation may confuse some children. In this case say to them: *20 is made of ... and ...*

- Repeat this process a few times, with the children snapping the sticks of cubes in different places each time and then writing the two numbers down on their whiteboards. Get the children to share their answers with one another.

TIP: This is a good opportunity to tell the children they are investigating **number bonds**. Say to them: *We are finding all of the ways to make 20 that we can. These are the **number bonds** to 20.*

ACTIVITY 2: Making a given number

- Place the number cards from Worksheet 4 in one pile, with the apple cards in one pile and the banana cards in another pile.
- Ask a child to take a number card from the top of the pile and read out the number (e.g. 11).
- Then ask the same child to select one card from the apple pile (e.g. five apples).

- *How many bananas do you need to make the 11 fruit?* (In this example, six are needed but note that this is not an example that is actually done with the cards)
- *Can you find the card to make a pair?*

- Ask the next child to carry out the activity.

WATCH OUT: Children may choose an apple card that is larger than their numeral. Remind them that they will need two cards to make their number and they should choose a different apple card that is smaller than their numeral.

TIP: There is more than one way to make each number. If a child cannot make their number with two fruit cards they should be encouraged to verbally make their number.

OBJECTIVES

- Recognise the place value of each digit in a two-digit number (tens, ones)
- Read and write numbers to at least 100 in numerals and words
- Identify, represent and estimate numbers using different representations, including the number track
- Use place value and number facts to solve problems

Rising Stars Progression Framework: 2.1.b.1, 2.1.b.2, 2.1.b.3, 2.1.d.1

RESOURCES

- Activity 1: Each child needs: 20 multi-link cubes, a whiteboard and pen
- Activity 2: Worksheet 4

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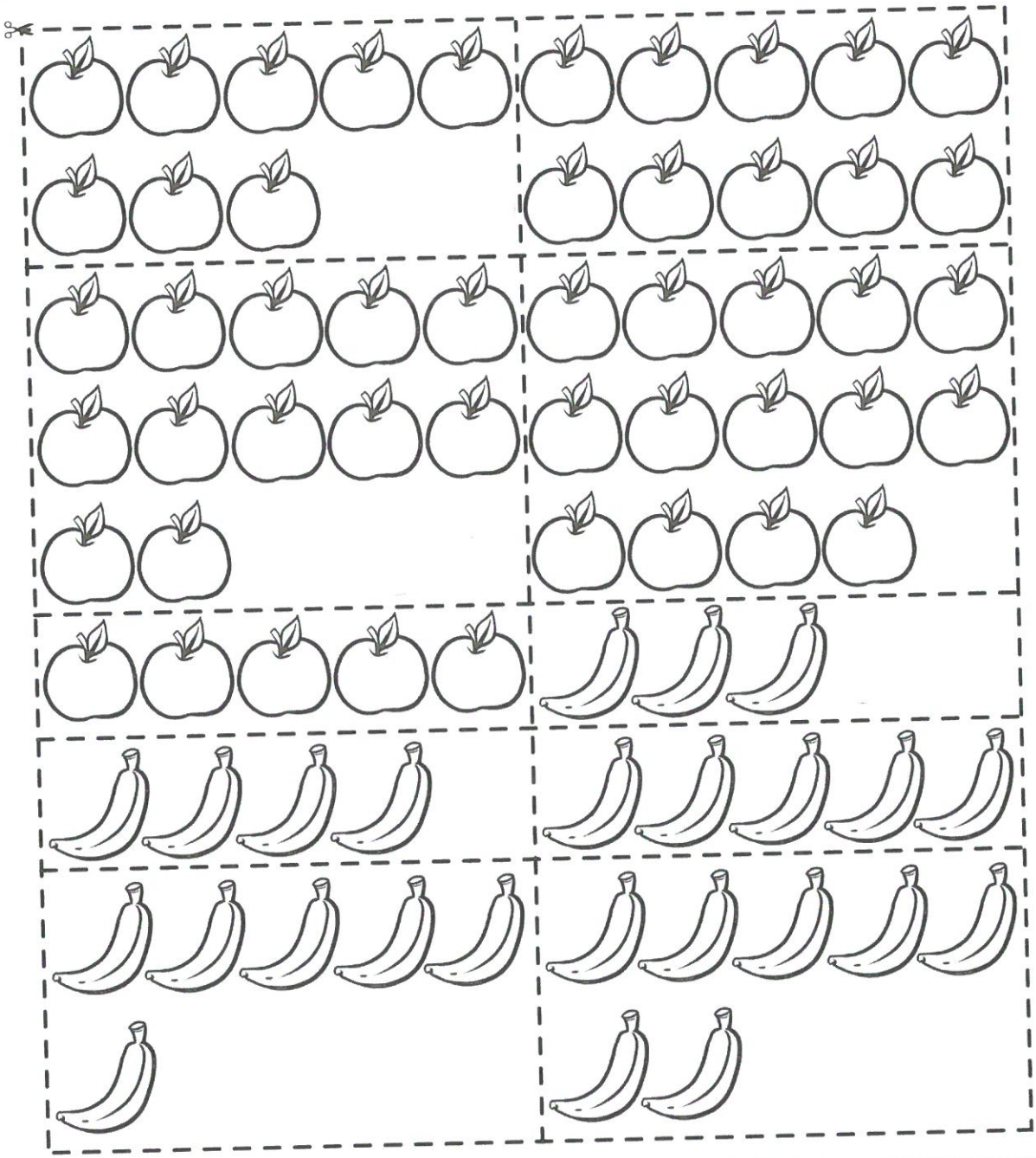
Worksheet 4

Photocopy and enlarge, if desired, and then cut the pictures out to make a set of cards.

Matching quantities and numerals cards

11	14	15	19	20



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Strand: Number

DAY 3

Sub-strand: Representing numbers

TEACH

ACTIVITY 1: Matching numerals to words

- As a whole group, read the word cards on Worksheet 5. Emphasise the *-ty* on the end of the **tens** number.
- Now look at the numeral cards. Say to the children: *We know that they are all -ty numbers, so this number would be 72. The seven shows us the -ty number as it is in the tens place in the number.*
- Divide the word cards equally between the children. Place the numeral cards on the table face down in front of them.
- Explain to the children that they are going to play a game of matching pairs: they need to take it in turns to turn over a numeral card and see if it matches any of their word cards. If the numeral card they pick matches one of their word cards, they can make a pair; if not they put the numeral card back.
- The children continue with the game until all of them have matched their word cards with their corresponding numeral cards.

TIP: Help the children to sound out the words if they are struggling. You can do this by using their knowledge of the stems of the words, if necessary (e.g. *sev-* in seventy). If they are struggling to read the numbers you could point out each numeral in turn and remind the children that the numeral in the tens place is giving us the *-ty* number.

ACTIVITY 2: Filling in missing numbers in a 100 square

- Give each child a copy of Worksheet 6 and a pencil. Ask the children to try filling in the numbers that are missing on the 100 square using their knowledge of one more and one less and place value.

WATCH OUT: Be sure not to let the children simply copy from one another – you should watch the way in which they find the missing numbers. Observe: Do they count on, find one more, find one less, count along the rows, down the columns, etc.?

OBJECTIVES

- Recognise the place value of each digit in a two-digit number (tens, ones)
- Read and write numbers to at least 100 in numerals and words
- Identify, represent and estimate numbers using different representations, including the number track
- Use place value and number facts to solve problems

Rising Stars Progression Framework: 2.1.b.1, 2.1.b.2, 2.1.b.3, 2.1.d.1

RESOURCES

- Activity 1: Worksheet 5
- Activity 2: Worksheet 6; pencils

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Worksheet 5

Photocopy and enlarge, if desired, and then cut out to make a set of word cards and a set of numeral cards.

Matching numbers and words cards

Word cards

Seventy-two	Twenty-six	Eighty-eight
Sixty-five	Thirty-one	Seventy-three
Ninety-seven	Twenty-eight	Fifty-nine
Fifty-four	Thirty-seven	Sixty-two
Forty-three	Forty-one	Ninety-four

Numeral cards

72	26	88
65	31	73
97	28	59
54	37	62
43	41	94

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Worksheet 6

Name _____ Date _____

Missing number 100 square

Fill in the numbers that are missing from the 100 square.

1		3	4	5	6	7	8	9	10
11	12		14	15	16	17		19	
21	22		24	25		27	28		30
	32	33	34	35	36		38	39	40
41	42	43	44		46	47	48	49	
51	52	53	54	55	56	57	58	59	
61		63			66	67	68	69	70
	72	73	74	75	76		78	79	
81	82	83		85		87	88	89	90
	92	93	94		96	97	98		100

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Strand: Number

DAY 4

Sub-strand: Representing numbers

TEACH

ACTIVITY 1: Estimating quantities

TIP: Define 'estimate' before getting started. (*An **estimate** is a sensible guess.*)

- Take out a handful (fewer than ten) of cubes from the box and put them on the table.
- Ask how many cubes are in the group; the children have three seconds to estimate before you hide them. They write down their estimates on their whiteboards.

WATCH OUT: The time limit of three seconds stops the children from counting the cubes.

- Collect their estimates before you count the cubes together.
- Continue by adding another handful of cubes to the quantity on the table. Point out that the quantity will be bigger now. Again, ask the children to estimate how many cubes there are now. The children write down their estimates on their whiteboards. Check their estimates and count the cubes.
- Repeat the game, sometimes adding cubes and sometimes taking them away.

WATCH OUT: The children need to recognise when the quantity is going to be big or small, and when there will be more or less. Reinforce this by saying: *I am adding/taking away cubes, so will the number be bigger or smaller?*

ACTIVITY 2: Matching quantities to numerals

- Print copies of Worksheet 7. Before you hand out a worksheet to a child, write a number into the box next to the alien. Vary the numbers so that different children have different numbers to work with.
- Explain that they will represent the number on their alien worksheet by drawing the same number of eyes on their alien. So: *If I have an alien with the number 11 written in the box, I draw on 11 eyes.*
- Ask them to check one another's alien. The children should look at the number in the box on each alien worksheet sheet and then check the number of eyes is correct by counting them.

OBJECTIVES

- Recognise the place value of each digit in a two-digit number (tens, ones)
- Read and write numbers to at least 100 in numerals and words
- Identify, represent and estimate numbers using different representations, including the number track
- Use place value and number facts to solve problems

Rising Stars Progression Framework: 2.1.b.1, 2.1.b.2, 2.1.b.3, 2.1.d.1

RESOURCES

- Activity 1: Big box of cubes; individual whiteboards and pens
- Activity 2: Worksheet 7 (one per child); pencils

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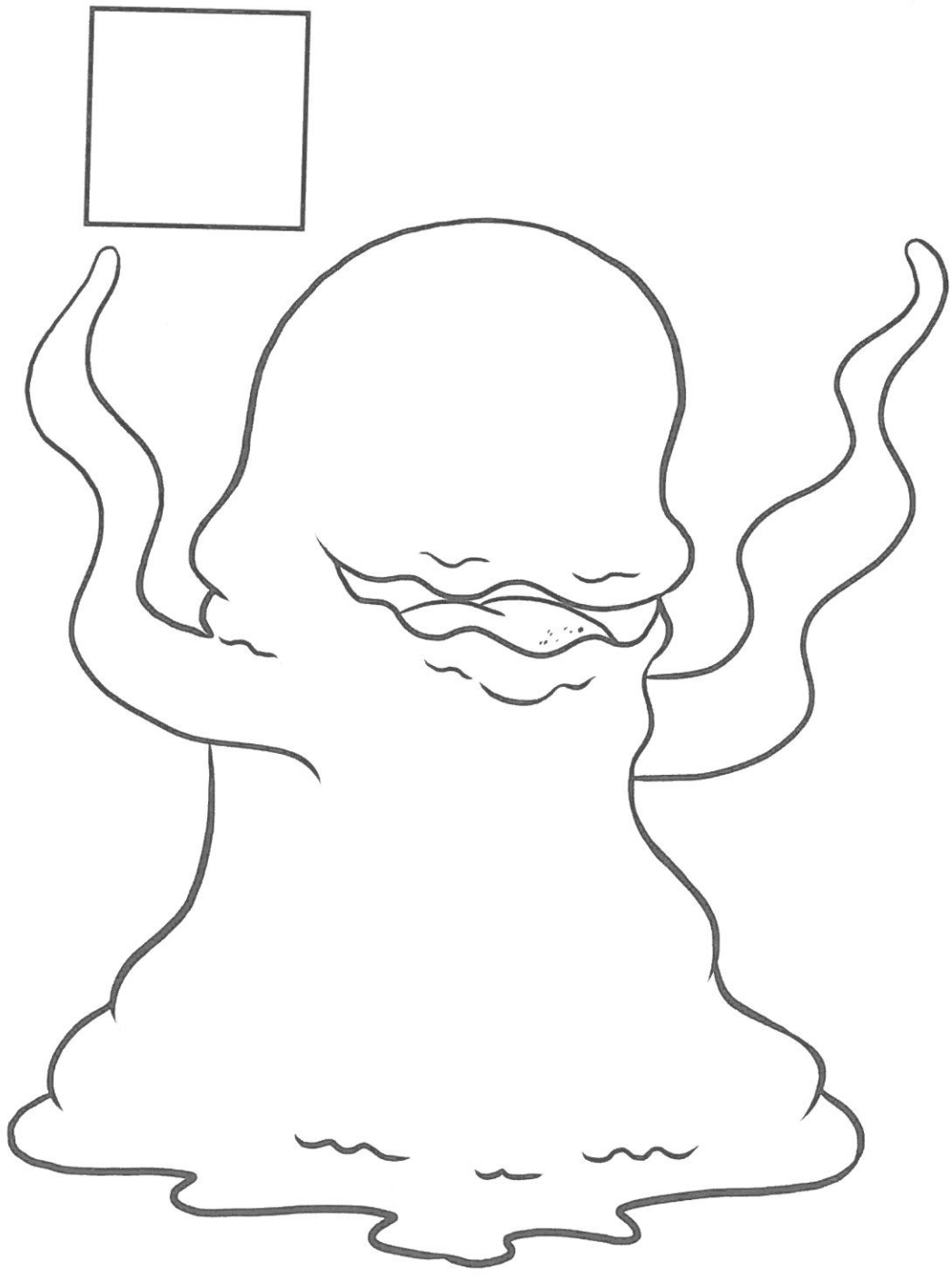
Worksheet 7

Name _____ Date _____

Alien eyes

Look at the number in the box. Then give your alien the same number of eyes.



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Strand: Number

DAY 5

Sub-strand: Representing numbers

ASSESS

ASSESSMENT ACTIVITY

- The purpose of the assessment is to check what each child can do independently, noting down any difficulties and misconceptions. The adult will need to watch carefully what the children do, any strategies used and confidence levels.
- Give each of the children a copy of Worksheet 8.
  - Question 1 asks the children to partition the numbers into tens and ones.

TIP: Ask the children if they can find any other ways to partition each number. E.g. 67 can be partitioned as 60 + 7, 50 + 17 and 62 + 5.

  - Question 2 requires children to reverse the process by recombining partitioned numbers.

WATCH OUT: Observe how children deal with the similar numbers in Questions 1 and 2 (24 and 42, 17 and 71). Can they say the numbers aloud correctly? If not, this may indicate that their understanding of place value is not secure. They will need more time to explore place value in two-digit numbers before moving on to place value in larger numbers.

  - Questions 3 and 4 ask the children to write numerals in words, and vice versa.

TIP: Observe how children deal with the three-digit numbers (125, 150) to assess their confidence in reading and writing numbers over 100.

- Then give each child 10 sticks of 10 cubes, and 10 ones from the Base 10 apparatus. Spread out the number cards, face down.
- Ask the children to each pick a number card from the table and make it using the Base 10 apparatus.

WATCH OUT: Each child should have a different number so that they cannot copy one another.

- Check their number. Ask: *How many tens and how many ones do you have? How do you know?*
- Repeat the activity until you have enough information for your assessment.

EVIDENCING SUCCESS

- The child can count out the number of counters represented by any two-digit number.
- The child can form a two-digit number from two digit cards and write it in words with an understanding of place value.
- The child can partition 67 as 60 + 7 and 50 + 17 and 62 + 5, showing these on a number track and using concrete objects.

OBJECTIVES

- Recognise the place value of each digit in a two-digit number (tens, ones)
- Read and write numbers to at least 100 in numerals and words
- Identify, represent and estimate numbers using different representations, including the number track
- Use place value and number facts to solve problems

Rising Stars Progression Framework: 2.1.b.1, 2.1.b.2, 2.1.b.3, 2.1.d.1

RESOURCES

- Each child should have: a copy of Worksheet 8, a pencil; number cards from 50 to 90; Base 10 apparatus

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Worksheet 8

Name _____ Date _____

Representing and identifying place value

1. Partition the numbers into tens and ones.

	Tens	Ones
67		
89		
24		
42		

2. Write the numbers shown in the grid in numerals.

	Tens	Ones
	9	9
	6	2
	1	7
	7	1

3. Write these numbers in words.

a) 15 _____

b) 61 _____

c) 95 _____

d) 125 _____

4. Write these numbers in numerals.

a) Sixty-two _____

b) Twenty-five _____

c) Twelve _____

d) One hundred and fifty _____

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Strand: Number

DAY 1

Sub-strand: Place value

TEACH

ACTIVITY 1: Ordering numbers in sequence

- Start by placing the number cards in order in a pile in the middle of the table.
- Ask each child to take some cards from the top of the pile (as if cutting the deck) and then tick four number cards from the new top of the deck.

TIP: If you start with the children you think will struggle most, then these children will have lower numbers to order than the children who pick their cards later.

- The children then shuffle their four numbers.
- Ask the children to now put their four numbers into order, creating their own number track and to then tell the group what they have made, e.g. *I have chosen 23, 24, 25, 26, so they go in that order.*
- As the children place the numbers in order, ask them questions such as: *How do you know the order of the numbers? Can you check by counting? Which number would come **next**? Which number would come **before**? Whose sequence in the group would come **first** if we were counting? Whose would come **last**?*

ACTIVITY 2: Ordering numbers out of sequence

- Collect back the children's number cards (four from each child) and shuffle them together.
- Deal out the cards to the children randomly, so each child has four cards.
- Ask the children to look at their cards. Ask: *Which is the smallest number you have? Put that one first. Which number would come next if you were to count forwards? How do you know?*
- Model the language of place value, e.g. *I need to order 56, 43, 73 and 58 from smallest to largest. First I look at the numbers in the tens position. Five tens are larger than four tens, and seven tens are larger than five tens. I know that 43 is my smallest number and 73 is my largest number. To order 56 and 58 I look at the numbers in the ones position. Eight ones are larger than six ones. My numbers ordered from smallest to largest are: 43, 56, 58, 73.*

TIP: Encourage the children to use a place-value grid as a visual support.

- The children now order their four cards in this way.
- Check the children's answers and repeat with other numbers until the children are able to order the numbers without your prompting questions.

OBJECTIVE

- Compare and order numbers from zero up to 100; use <, > and = signs

Rising Stars Progression Framework: 2.1.c.1

RESOURCES

- Activities 1 and 2: Number cards to 100

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Strand: Number

DAY 2

Sub-strand: Place value

TEACH

ACTIVITY 1: What do =, < and > mean?

- Show the children the symbol cards (=, <, >) cut out from Worksheet 9.
- The children should be familiar with =. Emphasise that the two sides of this balance will be **equal**.
- Discuss what < and > mean and emphasise the vocabulary of **more than** and **less than**.

WATCH OUT: Make sure to emphasise which side of the 'arrow head' the larger number would be on.

- Now hold up the symbol cards from Worksheet 9. As you hold them up, the children should tell you what they mean, using the vocabulary introduced earlier.
- Repeat a few times until you are sure they are secure in knowing what the three symbols mean.

ACTIVITY 2: Using < and > symbols in context (numbers under 20)

- Place the number cards to 20 face down on the table and spread out. Ask the children each to pick two cards from the table.
- Working in pairs, each child then reads their two numbers and tells their partner which number is **smaller** and which **number** is larger.
- Their partner then checks this description of the numbers using a number track.
- Show the children the cut-out symbol cards from Worksheet 9 and ask them to put their number cards on the correct side of one of the symbols. So, e.g. if they have said *18 is larger than 6*, they could show this as: *18 > 6* or *6 < 18*.
- Check the children's answers – *did they remember what the symbol means?*
- Repeat with the children choosing different numbers. Encourage the children to use the opposite symbol to the one they used previously.

OBJECTIVE

- Compare and order numbers from zero up to 100; use <, > and = signs

Rising Stars Progression Framework: 2.1.c.1

RESOURCES

- Activity 1: Worksheet 9
- Activity 2: Number cards to 20; Worksheet 9; number tracks

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Worksheet 9

Photocopy and then cut out the symbols to make a set of cards.

<, > and = signs

=	<	>
=	<	>
=	<	>
=	<	>
=	<	>

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Strand: Number

DAY 3

Sub-strand: Place value

TEACH

ACTIVITY 1: Placing <, > and = symbols between numbers

TIP: Have the cubes or counters available for all the children to use if they need them.

- Give each child a copy of Worksheet 10 and model filling in the first question. Say to them: *Here we have two numbers – 79 and 84. Which is the smaller number* (79) *and which is the larger number* (84)*? How could we show that we know this?* (By using either the 'is **more than**' or 'is **less than**' symbol.) *Which side of the symbol goes next to the larger number – the open side or the pointy side?* (The open side.) *So, in this case we would write: 79 < 84.*
- Display the symbols on the board with the first example completed as a reference.

TIP: The children could count out the correct number of cubes for each numeral and then compare the quantities using the concrete apparatus rather than the abstract numbers.

- Now ask the children to have a go at putting the symbols in between the numbers for the other questions.

WATCH OUT: The fourth row on the worksheet requires the use of the equals sign (11 = 11). Ensure that the children understand that the equals sign means 'equal' or 'equivalent to'.

ACTIVITY 2: Placing <, > and = symbols between calculations

TIP: Have the cubes or counters available for all the children to use if they need them.

- Give each child a copy of Worksheet 11 and model filling in the first question. Say to them: *Here we have two calculations (6 + 4 and 7 – 2). Which calculation gives the smaller number* (7 – 2) *and which gives larger number* (6 + 4)*? How could we show that we know this?* (By using either the 'is **more than**' or 'is **less than**' symbol.) *Which side of the symbol goes next to the larger number – the open side or the pointy side?* (The open side.) *So, in this case we would write: 6 + 4 > 7 – 2.*
- Now ask the children to have a go at putting the symbols in between the calculations for the other questions.

TIP: As the children are answering the questions on Worksheet 11, to ensure their understanding, talk to them about how they know the answers and how they could check their answers. (They could use the cubes to make each of the quantities, or they could use a number track or 100 square to find the numbers.)

WATCH OUT: Two rows on the worksheet require the use of the equals sign. Ensure that the children understand that the equals sign means 'equal' or 'equivalent to'.

OBJECTIVE

- Compare and order numbers from zero up to 100; use <, > and = signs

Rising Stars Progression Framework: 2.1.c.1

RESOURCES

- Activity 1: Worksheet 10; pencils; cubes or counters; whiteboard and pens
- Activity 2: Worksheet 11; pencils; cubes or counters

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Worksheet 10

Name _____ Date _____

Using <, > and = signs between numbers

Write the correct sign between the numbers to show whether the number on the left is **more than** (>), **less than** (<) or **equal to** (=) the number on the right.

79		84
24		56
75		63
11		11
34		35
28		76
54		12

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Worksheet 11

Name _____ Date _____

Using <, > and = signs between calculations

Write the correct sign between the calculations to show whether the calculation on the left gives an answer that is **more than** (>), **less than** (<) or **equal to** (=) the answer to the calculation on the right.

6 + 4		7 – 2
3 – 2		7 – 4
11 + 5		16 – 1
19 – 5		12 + 2
33 + 2		16 – 4
25 + 5		40 – 8
3 + 7		5 + 5

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Strand: Number

DAY 4

Sub-strand: Place value

TEACH

ACTIVITY 1: What number could I be? (using < and >)

- Put the number cards face down on the tables.
- Explain to the children that you will give them clues to which number you have chosen using the **more than** and **less than** signs, and they are to guess which number card you have chosen.
- Pick a number card from the deck (do not show the children) and ask the children to work as a group to write down their first guess and show you on their whiteboard. Show the children using the symbol cards from Worksheet 9 whether your number is < or > than their guess.
- The children continue to guess your number until they get the correct number and you show =.
- Next allow them to have their own whiteboard to guess. You will now need to show each child an appropriate sign for whether their guess is too high or too low.
- The first child to correctly guess your number becomes the person in charge of picking the number card. Support this child in using the <, > and = signs.

WATCH OUT: Observe the children closely, to check that they are responding appropriately to the clue you give them each time.

ACTIVITY 2: Where am I? (< and > using co-ordinates)

- Give each child a copy of Worksheet 12 (the map sheet) and four counters.
- Tell the children that you will tell them where each counter should go on the map using **more than** and **less than**.
  - *The first counter should go in a square where the box is labelled with a number that is **more than** 20 and **less than** 22.*
  - *The second counter should go in a square where the box is labelled with a number that is **more than** 6 but **less than** 8.*
  - *The third counter should go on a square where the number is 10 **more than** 36.*
  - *The final counter should go on a square where the box is labelled with the number that is 10 **less than** 59.*
  - Ask the children where their counters are. *Are they all in the same place?*

8

OBJECTIVE

- Compare and order numbers from zero up to 100; use <, > and = signs

Rising Stars Progression Framework: 2.1.c.1

RESOURCES

- Activity 1: Number cards to 100; whiteboard and pen per child; one set of cut-out cards from Worksheet 9, page 158
- Activity 2: Each child needs: Worksheet 12, four counters

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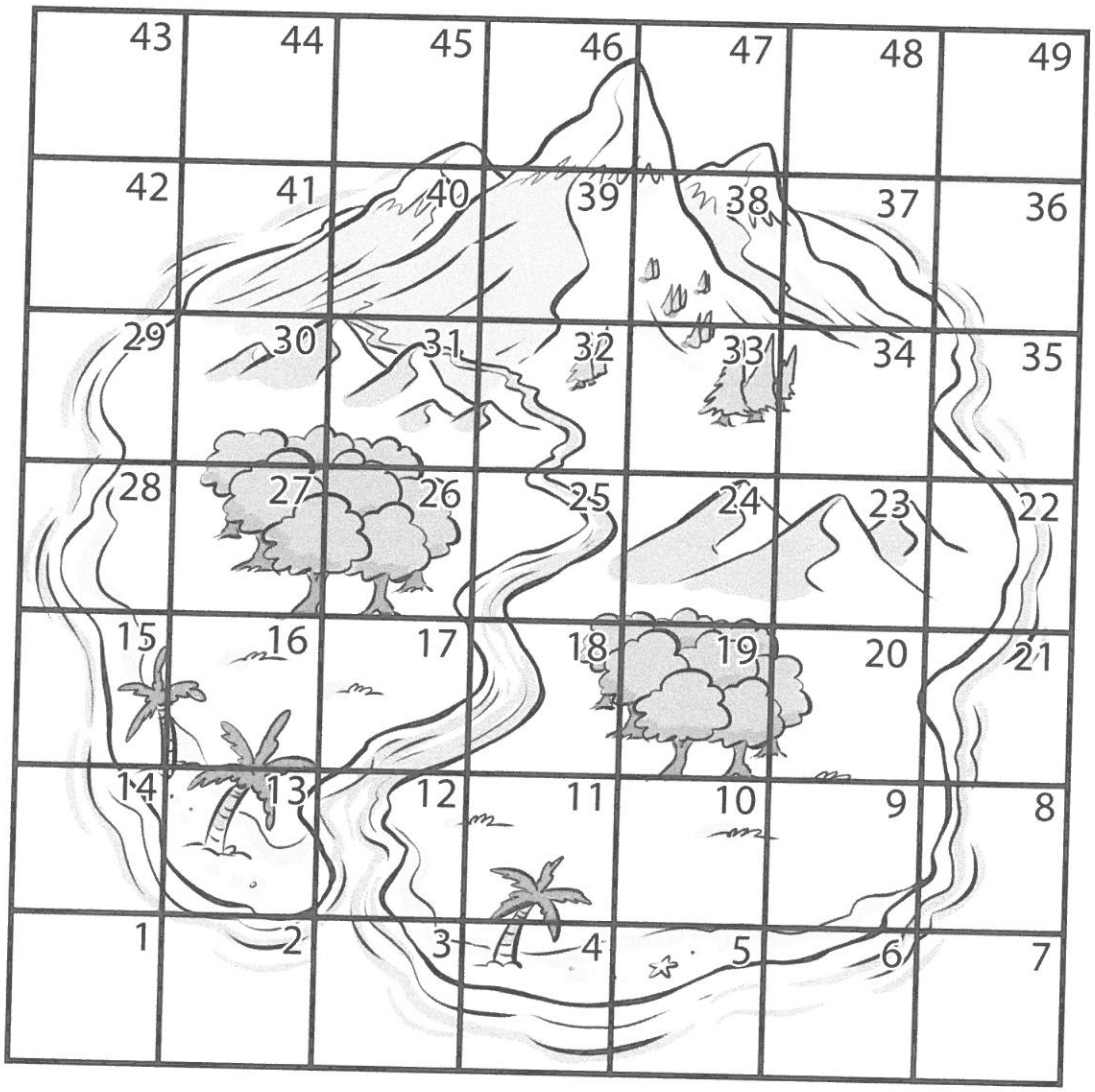
Worksheet 12

Name _____ Date _____

Where am I?

Listen to the instructions. Work out where to place your 4 counters on the map.



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Strand: Number

DAY 5

Sub-strand: Place value

ASSESS

ASSESSMENT ACTIVITY 1

- The purpose of the assessment is to check what each child can do independently, noting down any difficulties and misconceptions. The adult will need to watch carefully what the children do, any strategies used and confidence levels.
- Give each child a copy of Worksheet 13 and a pencil.
- Ask them to have a go at putting the numbers in order from smallest to largest using their knowledge of the number system.
- The completed worksheets could be kept as evidence.

WATCH OUT: Some children may mix up the tens numbers and the ones numbers. If this is the case and the numbers are incorrectly ordered, the children should work with you to complete the ordering of the numbers.

ASSESSMENT ACTIVITY 2

- Give each child a copy of Worksheet 14 and a pencil.
- Ask them to try putting the symbols in the correct place on the worksheet.
- The completed worksheets could be kept as evidence.

TIP: The children may wish to use counters or cubes to find the answers to some of the questions in this section. It may be handy to have them available to the children just in case. The children could make the quantities with the cubes to then compare rather than simply comparing the numbers.

EVIDENCING SUCCESS

Meeting expectations:

- The child can order the numbers 13, 31, 3, 33 and 30 and place the correct sign (<, > or =) in statements such as between 34 and 17 and between 45 and 34 + 11.

OBJECTIVE

- Compare and order numbers from zero up to 100; use <, > and = signs

Rising Stars Progression Framework: 2.1.c.1

RESOURCES

- Activity 1: Each child needs: Worksheet 13, pencil
- Activity 2: Each child needs: Worksheet 14, pencil, counters or cubes and number tracks

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Worksheet 13

Name _____ Date _____

Ordering numbers

1. Put these numbers in order in the boxes from **smallest** to **largest**.

3	87	28	45	33

2. Put these numbers in order in the boxes from **smallest** to **largest**.

100	65	4	79	11

3. Put these numbers in order in the boxes from **smallest** to **largest**.

25	76	43	69	12

4. Put these numbers in order in the boxes from **smallest** to **largest**.

98	23	56	97	4

5. Put these numbers in order in the boxes from **smallest** to **largest**.

13	31	3	33	30

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Worksheet 14

Name _____ Date _____

More than, less than or equals?

Complete the statements using the correct signs (=, < or >).

76		94
37		17
9		100
27		27
16 + 4		12 + 8
20 – 2		10 – 4

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Strand: Addition and Subtraction

DAY 1

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Number bonds to 10

- Give the children each a copy of Worksheet 1 (the gingerbread man picture) and ten small sweets.
- Each time the children find a pair of numbers that make 10 they are to write it down as an addition calculation on their whiteboard.
- Ask the children to put some of their ten sweets on one side of the gingerbread man and the remaining sweets on the other side.
- The children then count how many sweets are on each side and write this down as a **number bond** to 10.
- Once the children have found a number bond, they share it with the rest of the group and all children write it down.
- Continue like this until all of the number bonds to 10 have been found. Write down all permutations in order on the whiteboard.

WATCH OUT: Check: do the children know these number bonds by heart? Can they predict which number will pair with their first number to make 10?

ACTIVITY 2: Number bonds to 20

- Give each child ten more sweets – they should now have 20 each. Remind them of the process of finding **number bonds** – split the total into two groups and the number in each group makes up a part of the number bond.
- Ask the children: *Do you know any number bonds to 20 already?* The children may suggest 10 + 10 (through their knowledge of halves). Any of the correct number bonds to 20 that the children suggest should be written down on their whiteboards.
- Now repeat the process from Activity 1 – with the children dividing their total number of sweets on to the gingerbread man on Worksheet 1 – until they find all the number bonds to 20.
- Write down all permutations in order on the whiteboard.

TIP: If the children are counting the sweets each time, tell them a number bond to 20 will contain a one-digit number and a two-digit number (e.g. 6 + 14 = 20) and that the ones numbers add up to ten. There is one exception: 10 + 10 = 20.

OBJECTIVE

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

Rising Stars Progression Framework: 2.2.b.2

RESOURCES

- Activity 1: Each child needs: Worksheet 1, 10 small sweets (or other countable objects), a whiteboard and pen
- Activity 2: Each child needs: Worksheet 1, 20 small sweets (or other countable objects); a whiteboard and pen

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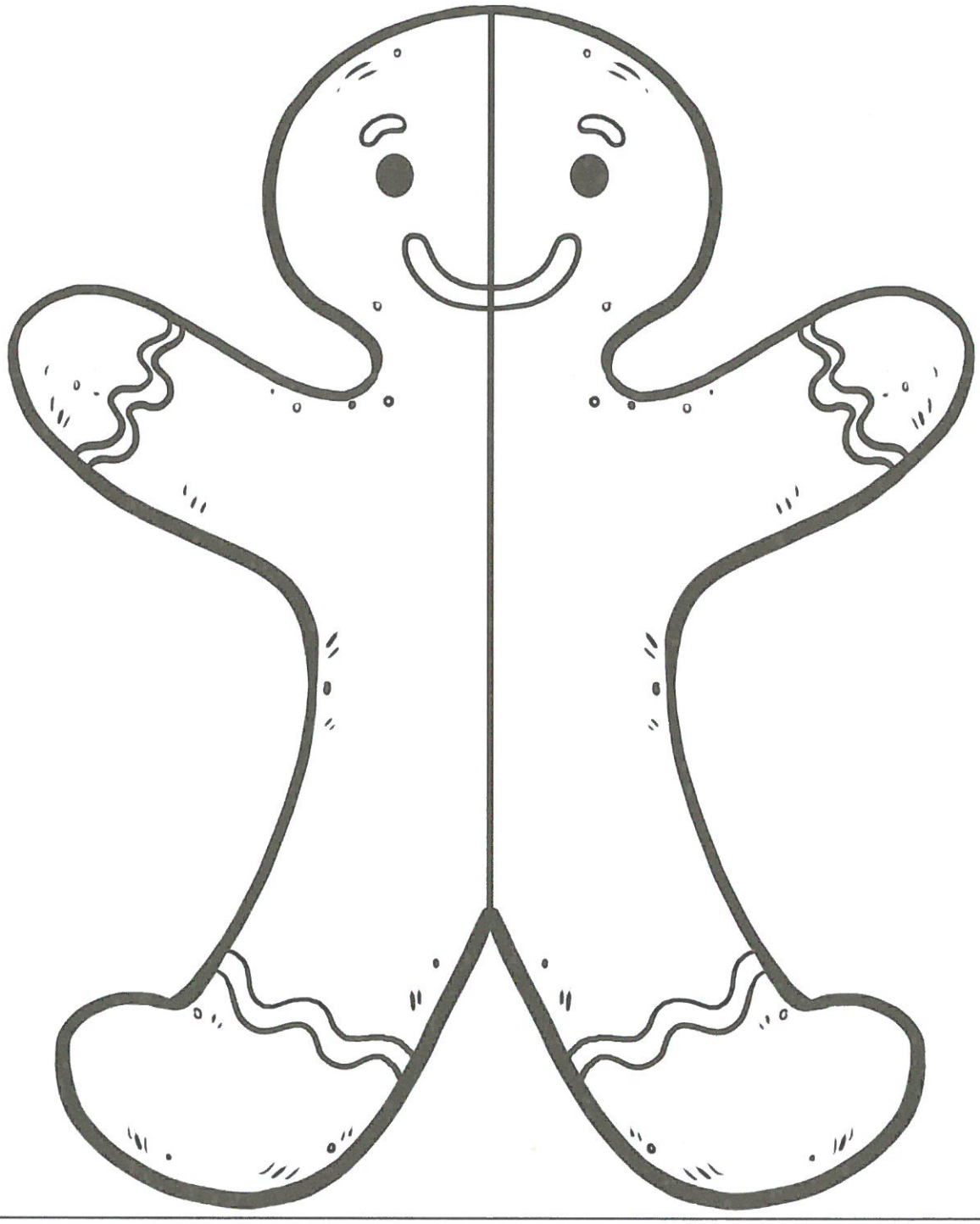
Worksheet 1

Name _____ Date _____

Number bonds gingerbread man

Find the number bonds to 10 and then 20.



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Strand: Addition and Subtraction

DAY 2

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Finding number bonds to 100 from number bonds to 10

- Ask the children to remind you of the **number bonds** to 10. Write them down on a board as **addition** calculations. If the children cannot think of all the number bonds, prompt them to remind them.
- Now ask the children to try to find a number bond to 100 using what they know about the number bonds to 10. Explain to the children that, by knowing a number bond in digits and turning it into tens, you can find a number bond to 100. So, e.g. 8 + 2 = 10 so 80 + 20 = 100.
- Ask the children to write down the number bonds to 100 on their whiteboards.

ACTIVITY 2: Answering addition questions using number bonds

- On the children's whiteboards they should now have the number bonds to 10 and the number bonds to 100.
- Model for the children adding two two-digit numbers together using these number facts: 24 + 36 =?. Say to them: *We know that 20 + 30 = 50 and we know that 4 + 6 = 10, so the answer to the question must be 60 because 50 + 10 = 60.*
- You could model this using Base 10 apparatus to show the children the process if necessary.
- Write 37 + 23 on the board for the children. Can they find the answer using the number facts they already know?

WATCH OUT: Observe the children when adding the numbers together. Do they use what they know about number bonds or are they counting on to find the answer or using another strategy? It is important that the children are using their knowledge of number bonds to find the answer.

- Repeat with other calculations, e.g. 46 + 54, 33 + 57, 82 + 18, 32 + 38.

OBJECTIVE

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

Rising Stars Progression Framework: 2.2.b.2

RESOURCES

- Activities 1 and 2: Each child needs a whiteboard and pen
- Base 10 apparatus

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Strand: Addition and Subtraction

DAY 3

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Answering subtraction questions using number bonds

- Remind the children of the **number bonds** to 10 by recalling them orally as a group; e.g. *10 + 0 = 10*.
- Start by saying: *We know that 8 + 2 is 10 so we therefore know that 10 – 8 is* ... Encourage the children to complete the calculation.
- Now give the children a calculation to solve orally. E.g. 10 – 5 =, 10 – 6 =, 100 – 60 =, 100 – 70 =, 70 – 30 =. Ask them to write their answer on their whiteboard and to hold it up.
- Children could be provided with Base 10 apparatus to support them here. However, this is a mental strategy and the children should be encouraged to calculate mentally.

TIP: The questions listed above start off as easy calculations and then move into more tricky problems. At the point where the children seem to be struggling, revert to the difficulty level of the question before, to give the children more practice.

ACTIVITY 2: Subtracting by counting back mentally

- Tell the children that they can find the answer to challenging **subtraction** calculations by **counting back** from the first number.
- Model this to the children by finding the answer to 78 – 9. Say to them: *We know that we are starting with 78, so we will put that number in our heads.* (Put your hands on your head for a second.) *We are taking away nine, so I will put that number on my fingers. Put your hands on your head to show the number is in your head and say '78', then show nine fingers in front of you as you count down to find the answer. 77, 76, 75, 74, 73, 72, 71, 70, 69. So I know that 78 – 9 is 69.*

TIP: It is important that your hands rest on your head for the starting number (78) and then your fingers count down for the rest of the numbers (77 to 69) to emphasise that the starting number is *not* one of the numbers you count back.

- Give the children another calculation to do, e.g. 66 – 8. Encourage them to use their hands on their heads and their fingers to count down.

WATCH OUT: Do the children know they do not start counting back from the number in their heads?

- Repeat with further calculations, e.g. 77 – 8 =, 54 – 6 =, 33 – 5 =, etc.

OBJECTIVE

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

Rising Stars Progression Framework: 2.2.b.2

RESOURCES

- Activities 1 and 2: Each child needs a whiteboard and pen
- Base 10 apparatus

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Strand: Addition and Subtraction

DAY 4

Sub-strand: Mental calculation strategies

ASSESS

ASSESSMENT ACTIVITY

- The purpose of the assessment is to check what each child can do independently, noting down any difficulties and misconceptions. The adult will need to watch carefully what the children do, any strategies used and confidence levels.
- Hand out copies of Worksheet 2 the children and ask them to try answering the questions on the worksheet *in their heads* (though they should write down their answers to the questions on the worksheet!).
- Remind the children, if necessary, of the strategies they learned this week, which they can use to answer the questions:
  - counting backwards from a number in their heads
  - using number bonds and familiar number facts to help them
  - counting on using their fingers or in their heads.

TIP: The aim is for the children to complete the questions on the worksheet in their heads. However, should the children struggle to do this it is important for them to feel a sense of success; therefore it is fine to allow them to use concrete resources (such as buttons and cubes, number tracks, etc.) to complete these activities.

WATCH OUT: Observe the children while they complete the assessment. Do they use their fingers to answer the questions? Do they jot down anything to help them?

EVIDENCING SUCCESS

Meeting expectations:

- The child can deduce that 20 + 70 = 90 and 42 + 37 = 79 from 2 + 7 = 9.

OBJECTIVE

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

Rising Stars Progression Framework: 2.2.b.2

RESOURCES

- Each child needs: Worksheet 2, a pencil, manipulative resources (e.g. buttons, cubes, number tracks) if needed

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Worksheet 2

Name _____ Date _____

Applying mental maths

Answer these number questions using your knowledge of number facts.

1. 12 + 6 = ☐
2. 20 + 70 = ☐
3. 27 + 13 = ☐
4. 46 + 37 = ☐
5. 19 + 11 = ☐
6. 20 – 10 = ☐
7. 37 – 11= ☐
8. 87 – 6 = ☐
9. 44 – 8 = ☐
10. 19 – 17 = ☐

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Strand: Addition and Subtraction

DAY 1

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Adding with dominoes

- Put a pack of dominoes face down in the middle of the group. Each child picks a domino and reads the **addition** calculation from the face of the domino.
- Ask the children to say their addition calculation (e.g. three **add** five **equals**) and then work out the answer by counting the spots altogether or by counting on from the first number.
- Now ask the children to turn their domino the other way around and repeat the calculation.
- Discuss that the children can **add the two numbers together in either order** and still make the same total.
- Repeat with other dominoes.

TIP: As the children become more confident you could ask them to tell you the second calculation and the answer without re-calculating.

ACTIVITY 2: Adding on a number track

- Lay out a number track of numbers from 1 to 20 on the carpet that is big enough for the children to walk along.
- Tell a child an **addition** calculation such as four and three *more*.
- Model starting off on the first number and then moving the correct number of steps to find the answer. Then write down the number sentence on a whiteboard.
- Now ask a child to do the calculation in the other order in the same way you have just modelled; e.g. three and four *more*.
- Check the number the child lands on and record the number sentence on the board underneath the original one. Draw the children's attention to how the answer is the same.
- Repeat with other number sentences (e.g. 8 + 3, 7 + 6, 12 + 4, 11 + 6, 5 + 2) using a variety of vocabulary: **more**, **and**, **altogether**, **add**, **sum**.

OBJECTIVES

- Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with addition and subtraction

Rising Stars Progression Framework: 2.2.a.1, 2.2.a.2, 2.2.c.2

RESOURCES

- Activity 1: Dominoes
- Activity 2: Number track from 1 to 20; whiteboard and pen

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Strand: Addition and Subtraction

DAY 2

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Subtracting fish in ponds

- Before this activity you will need to make photocopies of Worksheet 3 and cut out enough fish for the children to have ten fish and one pond each.
- Put the **subtraction** calculation cards (cut out from Worksheet 4) on the table face down and give each child a pond and ten fish.
- Ask the children to choose one subtraction calculation card each (e.g. 8 – 6) and then put the correct number of fish into their pond to start with (eight).
- The children then **subtract** the second number of fish (e.g. six) from the pond to find the answer and write it on their whiteboard.
- Now model to the children writing the calculation down with the first two numbers in the other order, e.g. 6 – 8. The children try to solve this calculation using the fish and ponds.

WATCH OUT: The children will not be able to solve this calculation; they do not have enough fish. Explain that, unlike addition, **subtraction cannot be done in any order**.

- Repeat with other calculation cards.

ACTIVITY 2: Subtracting using number tracks

- The words **fewer**, **less**, **subtract** and **difference** should be displayed on the board.
- Give each child a number track to 20, with a see-through coloured counter or other movable resource.
- Put the same subtraction calculation cards face down on the table and ask the children to pick one each.
- The children read their calculation to the group using one of the words from the board. E.g. *Six **subtract** three*.

WATCH OUT: Some children may struggle to put these words in the correct phrasing. If so, repeat their calculation back to them using the vocabulary **subtract**, **fewer than**, **less than**, **difference.**

- On their number tracks, the children now put their counter/paper-clip on the first number of the calculation and then move it back the correct number of spaces to find the answer.

OBJECTIVES

- Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with addition and subtraction

Rising Stars Progression Framework: 2.2.a.1, 2.2.a.2, 2.2.c.2

RESOURCES

- Activity 1: Worksheet 3 (10 fish and 1 pond per child); whiteboards and pens; Worksheet 4 (subtraction cards)
- Activity 2: Number track to 20 per child; a clear coloured counter or paper-clip per child; Worksheet 4

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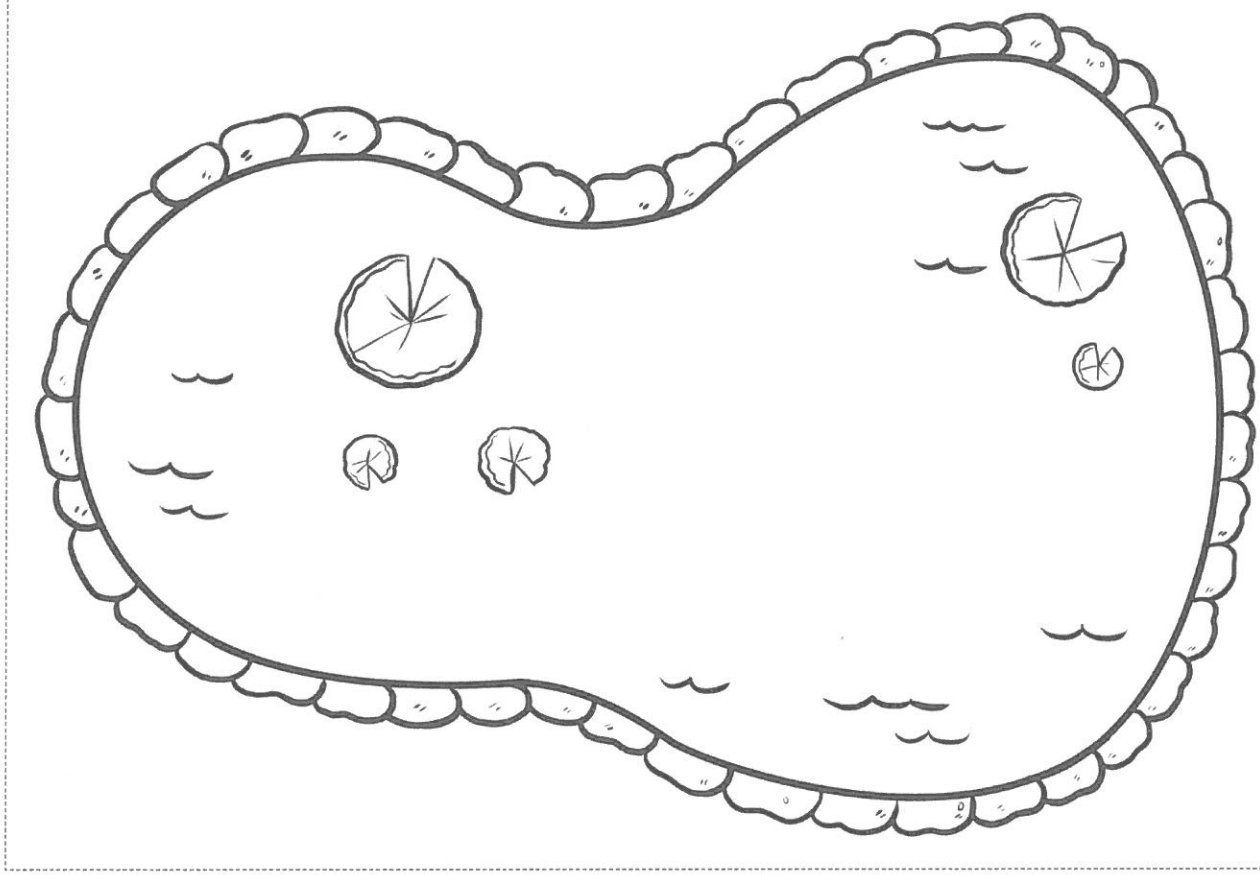
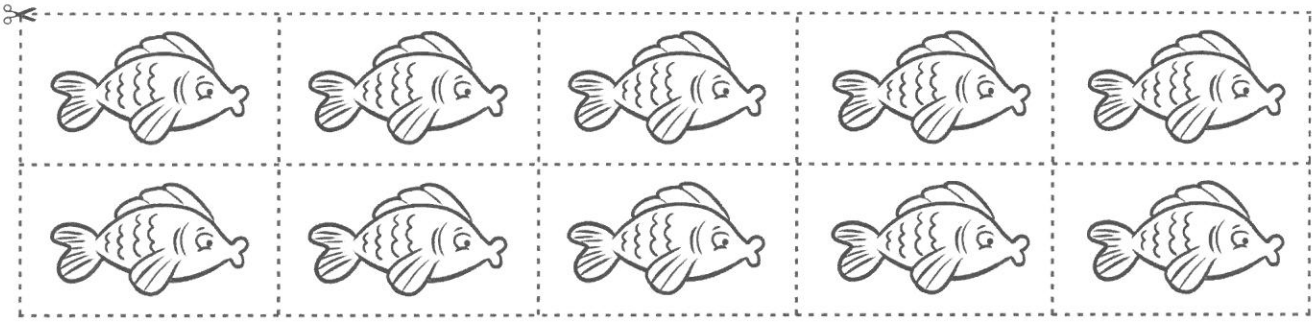
Worksheet 3

Photocopy and cut out the pictures, giving each child ten fish and one pond.

Subtracting fish from a pond





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Worksheet 4

Photocopy and cut out a set of calculation cards.

Subtraction calculation cards

5 – 4 =	10 – 7 =
3 – 1 =	17 – 7 =
12 – 5 =	18 – 3 =
8 – 6 =	19 – 5 =

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Strand: Addition and Subtraction

DAY 3

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Introducing inverse operations

- Give each child a copy of Worksheet 5. Ask the children to cut out the cars from the worksheet.
- Now give the children an oral **subtraction** calculation from ten; e.g. *ten* **subtract** *four*.
- Ask the children to solve the subtraction calculation by taking the cars away from the 10 on the worksheet using the car park framework to help.
- Write this calculation down on a board for the children to see.
- Then ask the children to **add** the two groups of cars back together and to tell you the total number of cars.
- Write this calculation down as an **addition** calculation.
- Repeat the calculations with different calculations from ten.

ACTIVITY 2: Finding pairs of calculations

- Give the children a pile of subtraction and addition calculation cards (cut out from Worksheet 6) and some manipulative resources such as buttons or cubes, to help them to solve the calculations if necessary.
- Ask the children to read the calculations on the cards and try to solve them.
- When the children find two calculations with the same three numbers in, e.g. 10 – 4 = 6 and 6 + 4 = 10, ask them to check whether they are the inverse using the procedure just taught.
- The first child to find an **inverse pair** stops the group, who then checks their answer. The children then continue to find their own inverse pairs.

TIP: Do use the term **inverse pairs** with the children. Explain that **inverse** means they do the opposite of each other or they can cancel each other out.

OBJECTIVES

- Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with addition and subtraction

Rising Stars Progression Framework: 2.2.a.1, 2.2.a.2, 2.2.c.2

RESOURCES

- Activity 1: Worksheet 5; scissors
- Activity 2: Worksheet 6 (cut into subtraction cards); buttons or cubes

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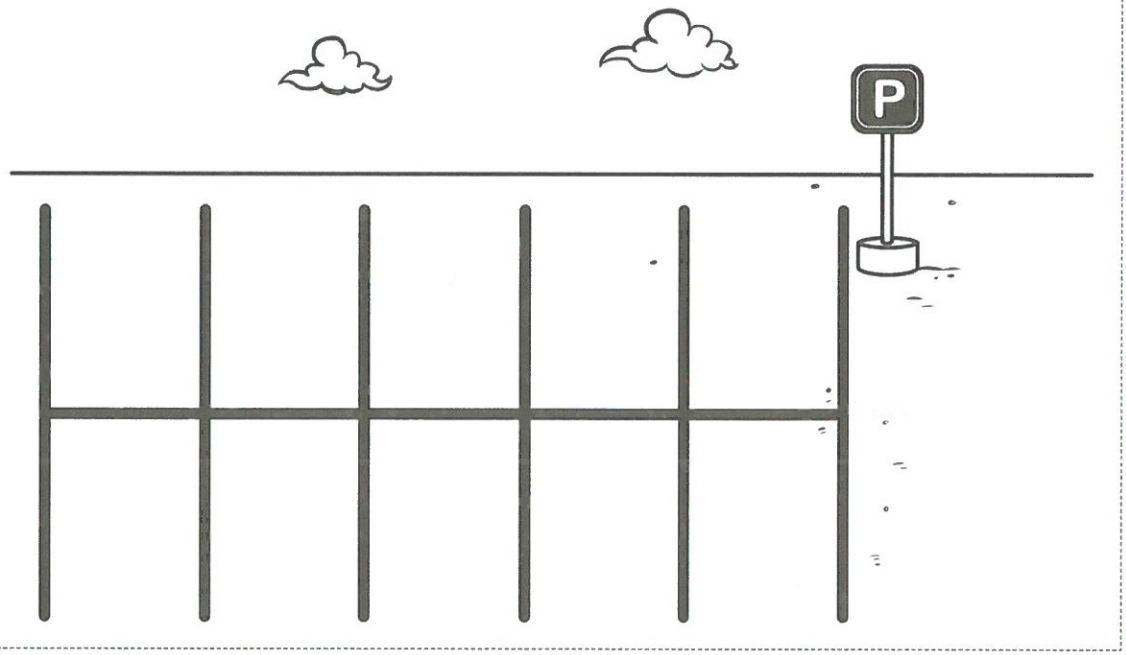
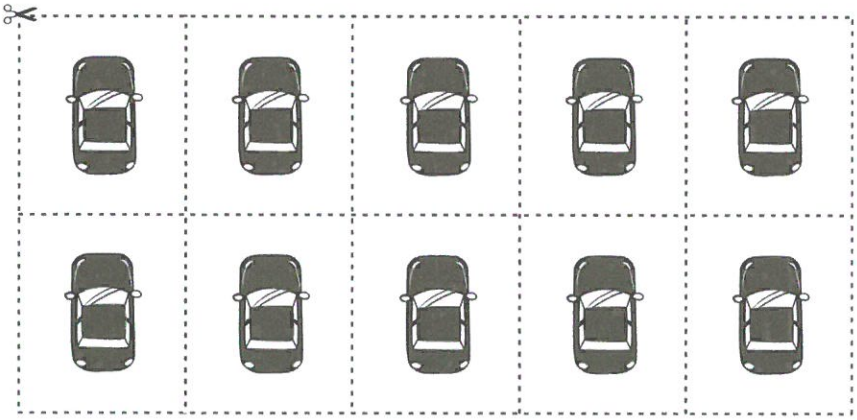
Worksheet 5

Name _____ Date _____

Adding and subtracting cars in a car park





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Worksheet 6

Photocopy and cut out so that each child has a set of cards.

Inverse calculation cards

$10 - 4 =$	$6 + 4 =$
$10 - 7 =$	$7 + 3 =$
$10 - 1 =$	$9 + 1 =$
$10 - 8 =$	$8 + 2 =$
$10 - 5 =$	$5 + 5 =$
$10 - 0 =$	$10 + 0 =$

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Strand: Addition and Subtraction

DAY 4

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Warm-up calculations

- Give each child a calculation to solve – **addition** or **subtraction** (you can use the calculation cards from Worksheet 6, page 179). Tell the children that someone in the group has got the **inverse** calculation on their card.
- Ask the children to solve their own calculation and then try to find their partner (i.e. the person with the inverse calculation) using the method taught previously.
- The children move around the group looking at one another's cards. E.g. *I have 6 + 3 = 9 so I know my partner will have 9 – 3 = 6 or 9 – 6 = 3.*

TIP: If you have an odd number of children in the group, when the children have found their partner they could work together to make the inverse calculation to the odd card out.

ACTIVITY 2: Missing number problems

- Revisit the pairs of calculations from Worksheet 6, page 179. Say to them: *We know they are **inverse pairs** because the three numbers in each calculation are the same, and when we work them out we can see that they undo one another.*
- Show the children a missing number problem, e.g. 4 + ? = 10. Ask them which calculation this is – addition or subtraction? Establish: *It is addition so the inverse calculation must be subtraction. We tend to use the bigger number first in subtraction, so what calculation would it make? (10 – 4 = ?)*
- Show the children how to solve the missing number problem by subtracting four from ten using cubes or counters and then check your answer by adding six onto four. Establish with the children that: *In this case the missing number is six.*
- Now give the children a missing number problem each to solve using their knowledge of inverse operations. Possible calculations are 6 – ? = 3, 8 + ? = 10, 5 + ? = 12.

WATCH OUT: If the children struggle to find the missing number, watch them solve their calculation to see whether they are using the correct inverse calculation and counting correctly.

OBJECTIVES

- Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with addition and subtraction

Rising Stars Progression Framework: 2.2.a.1, 2.2.a.2, 2.2.c.2

RESOURCES

- Activity 1: Calculation cards from Worksheet 6, page 179; cubes or counters
- Activity 2: Calculation cards from Worksheet 6, page 179; cubes or counters

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Strand: Addition and Subtraction

DAY 5

Sub-strand: Mental calculation strategies

ASSESS

ASSESSMENT ACTIVITY 1

- The purpose of the assessment is to check what each child can do independently, noting down any difficulties and misconceptions. The adult will need to watch carefully what the children do, any strategies used and confidence levels.

WATCH OUT: Observe the children to see if they are aware of the commutative nature of addition and the one-way nature of subtraction.

- Put the number and operation cards face down on the table. Ask the children to pick three cards – two number and an operation card (+ or –).
- They arrange the cards to make a calculation and then solve it practically using a number track or concrete resources such as cubes or counters. There is no need for the children to write or display the answer to the calculation.
- Now give the children the other operational symbol and two new numbers and ask them to make another calculation to solve. Again check the children understand why they have put the numbers in the order they have chosen.

ASSESSMENT ACTIVITY 2

- Give each child a copy of Worksheet 7, which has various missing number problems to solve. Ask the children to try to work out the missing number in each case by using their knowledge of the **inverse calculation**. They can have access to number tracks, cubes or counters, as necessary.

WATCH OUT: Check the children understand the opposite functions and how to use them to work out the missing number. If they are struggling, work through the questions giving a little less prompting and support with each calculation, until the children are able to complete them independently.

- When they find the missing number the children check their calculation.

EVIDENCING SUCCESS

Meeting expectations:

- The child can demonstrate that 8 + 2 is the same as 2 + 8 but that 8 – 2 is not the same as 2 – 8, using appropriate images or manipulatives.
- The child can interpret 'sum' as implying addition and 'difference' as implying subtraction.
- The child understands that 6 + 3 = 9 is the inverse of 9 – 3 = 6.

OBJECTIVES

- Show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with addition and subtraction

Rising Stars Progression Framework: 2.2.a.1, 2.2.a.2, 2.2.c.2

RESOURCES

- Activity 1: Number cards to 20 and operation cards; counters or cubes or number tracks
- Activity 2: Worksheet 7; counters or cubes or number tracks

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Worksheet 7

Name _____ Date _____

Missing number questions

$5 + \square = 11$	$8 + \square = 12$
$\square - 5 = 16$	$5 + 11 = \square$
$3 + \square = 9$	$10 + \square = 21$
$20 - \square = 10$	$\square + 5 = 8$
$15 + \square = 19$	$\square - 8 = 6$

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Strand: Addition and Subtraction

DAY 1

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Adding three one-digit numbers mentally

- Shuffle the number cards and place them in a pile face down on the table.
- Pick three cards from the top of the pile and write them as an addition sentence on a whiteboard (e.g. 1 + 2 + 3 =).
- Model adding the first two numbers together by counting on from the first number and laying out the corresponding number of counters, tapping them as you count.
- Next, model counting on the third number from that total, again using counters to support you as before.
- Write the answer on the whiteboard.
- Now ask a child to pick three more cards from the top of the pile. All children write down the calculation in the way you modelled earlier and then find the answer to the question by counting on at each step.
- Repeat this process with the children until they are confident when counting on to find the answers.

WATCH OUT: How quickly the children become confident in this depends on how secure they are with counting on. If the children are struggling to calculate mentally in this way, repeat the activity using number tracks or other manipulative resources.

ACTIVITY 2: Adding two two-digit numbers mentally

- Repeat Activity 1 but with the set of two-digit number cards. So, an addition calculation using the number cards from 10 to 30 might be 11 + 24 =.
- Talk the children through an example. Remind them that addition can be done in any order, so the children can start from the larger number (e.g. 24 + 11 =), whether it came out of the pile first or second.
- The children now turn over two number cards and write down an addition calculation. They then put the larger number in their heads and count on the smaller number of steps.

WATCH OUT: This objective focuses on the children using mental calculation. However, if the children are struggling allow them to use a manipulative resource such as beads or buttons.

OBJECTIVE

- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; three one-digit numbers

Rising Stars Progression Framework: 2.2.b.1, 2.2.b.2, 2.2.e.1

RESOURCES

- Activity 1: Each child needs: whiteboard and pen, number cards from 1 to 9, counters
- Activity 2: Each child needs: whiteboard and pen, two-digit number cards (from 10 to 30), manipulatives

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Strand: Addition and Subtraction

DAY 2

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Subtracting a one-digit number from a two-digit number mentally

- Give each child a piece of paper and a pencil. Place the two piles of number cards (from 1 to 9 and from 10 to 20) face down on the table.
- Turn over a two-digit number card (from 10 to 20) from the pile. Ask the children to draw that many dots on their paper.
- Remind them that **subtraction** is **taking away** – making a number smaller.
- Now turn over a one-digit number card and ask the children to cross off that many dots from the page.
- Ask the children to write down the number calculation they have just completed. They should then count the remaining number of dots to find the answer to the calculation.
- Repeat this process a couple of times.
- Then move on to solving these calculations mentally.
- Turn over a two-digit number and then a one-digit number. To find the answer, encourage the children to count back mentally the number of steps they would have crossed off from the quantity of dots.

WATCH OUT: It is important that the children are secure with subtraction as counting back before they move on to Activity 2.

ACTIVITY 2: Subtract a two-digit number from a two-digit number mentally

- Place the two piles of number cards (from 10 to 20 and from 21 to 30) face down on the table. Turn over one of the larger two-digit number cards (from 21 to 30) from the pile. Then turn over one of the smaller two-digit number cards (from 10 to 20) from the pile.
- The children must decide which number is larger and start at this number before counting back the smaller number of steps in their heads.

TIP: If the children struggle to count back mentally, you could offer them a concrete resource to support them, such as a number track or set of counters.

OBJECTIVE

- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; three one-digit numbers

Rising Stars Progression Framework: 2.2.b.1, 2.2.b.2, 2.2.e.1

RESOURCES

- Activity 1: Each child needs: paper, pencil, number cards from 1 to 9 and 10 to 20
- Activity 2: Each child needs: paper, pencil, number cards 10 to 20 and 21 to 30; number tracks and counters if needed

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Strand: Addition and Subtraction

DAY 3

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Place-value (arrow) card addition

WATCH OUT: Before this session the children will need to be familiar with place-value (arrow) cards: these show hundreds, tens and ones on separate arrows which, when sitting on top of one another, make full numbers. If the children are not familiar with the place-value (arrow) cards, run through a quick introduction to them

- Show the children an **addition** calculation; e.g. 25 + 45. Ask the children to make the two numbers in the calculation using the **place-value** (arrow) cards.
- Then get the children to partition the numbers by taking the place-value (arrow) cards apart. They should put the tens numbers one above the other and the ones one above the other. So, e.g.:

- The children then add the tens numbers together and write this number down (60). Next they add the ones numbers together and write this number down (10). They then add these two numbers together to find the total (70).

TIP: If the children need a little support in this step, use a 100 square or number track to support them in counting on to add the numbers together.

- Now ask the children to repeat the process to find the answers to these calculations: 27 + 12; 33 + 14.
- After each calculation, ask the children to check one another's answers. *Can they explain how they found their answers to another person in the group?*

ACTIVITY 2: Practising addition questions

- Give each of the children a copy of Worksheet 8. Ask them to find the answer to the calculations using the method they have just used and to write their method down.

TIP: Some of the children may still need to use the place-value (arrow) cards for support in this process.

- After the children have completed the worksheet, check their answers as a group.

OBJECTIVE

- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; three one-digit numbers

Rising Stars Progression Framework: 2.2.b.1, 2.2.b.2, 2.2.e.1

RESOURCES

- Activity 1: Place-value (arrow) cards (one set per child); number tracks or 100 square if needed
- Activity 2: Each child needs: Worksheet 8, a pencil

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Worksheet 8

Name _____ Date _____

Using partitioning for addition

Find the answers to these calculations using partitioning.

14 + 13 = ☐

27 + 42 = ☐

19 + 52 = ☐

14 + 34 = ☐

24 + 37 = ☐

18 + 27 = ☐

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Strand: Addition and Subtraction

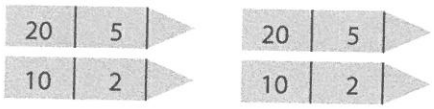
DAY 4

Sub-strand: Mental calculation strategies

TEACH

ACTIVITY 1: Place-value (arrow) card subtraction

- Show the children a **subtraction** calculation; e.g. 25 – 12. Ask the children to make the two numbers in the calculation using the **place-value** (arrow) cards.
- The children then partition the numbers by taking the place-value (arrow) cards apart. They should put the tens numbers one above the other and the ones one above the other. So, e.g.:



- The children then subtract the bottom tens number (10) from the top tens number (20) and write the answer down (10) before subtracting the bottom ones number (2) from the top ones number (5) and writing down the answer (3). They then put the two numbers together to find the answer (13).
- Now ask the children to repeat the process to find the answers to these calculations: 27 – 12; 33 – 11.
- After each calculation, ask the children to check one another's answers.

TIP: If the children are struggling to calculate mentally you could offer the children a 100 square to help them. This will visually show them counting down through the numbers to find the answer.

ACTIVITY 2: Practising subtraction questions

- Give each of the children a copy of Worksheet 9. Ask them to find the answer to the calculations using the method they have just used, but writing it down rather than using the place-value (arrow) cards.

TIP: Some of the children may still need to use the place-value (arrow) cards for support in this process.

- After the children have completed the calculations on the worksheet, check their answers as a group.

OBJECTIVE

- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; three one-digit numbers

Rising Stars Progression Framework: 2.2.b.1, 2.2.b.2, 2.2.e.1

RESOURCES

- Activity 1: Place-value (arrow) cards (one set per child); paper and pencils
- Activity 2: Each child needs: Worksheet 9, a pencil

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Worksheet 9

Name _____ Date _____

Using partitioning for subtraction

Find the answers to these calculations using partitioning.

27 – 12 = ☐

45 – 23 = ☐

17 – 4 = ☐

49 – 25 = ☐

56 – 34 = ☐

37 – 27 = ☐

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Strand: Addition and Subtraction

DAY 5

Sub-strand: Mental calculation strategies

ASSESS

ASSESSMENT ACTIVITY

- The purpose of the assessment is to check what each child can do independently, noting down any difficulties and misconceptions. The adult will need to watch carefully what the children do, any strategies used and confidence levels.
- Explain to the children that throughout the session they will use their knowledge of partitioning and counting on and back to find the answers to the **subtraction** and **addition** calculations. You could draw out of the children how to do this by asking them a few simple questions before they start, such as: *Which way do we need to count if we are subtracting? Which way do we need to count if we are adding?*
- Give each of the children a copy of Worksheet 10 and ask them to find the answers to the questions using the partitioning method they learned earlier in the week.
- The children write their calculations in the spaces provided, to show they are able to partition the numbers correctly.

TIP: Allow the children to use counters or other manipulatives (e.g. beads, cubes) to find the answers, if necessary. The children should also have access to the place-value (arrow) cards.

WATCH OUT: Observe how the children solve the problems in front of them and make a note of any misconceptions they may still have. These misconceptions could be that they are counting in the wrong way or that they are forgetting to combine the two parts of their partitioned answers.

EVIDENCING SUCCESS

Meeting expectations:

- The child can partition 27 + 12 to 20 + 7 + 10 + 2 in a vertical arrangement to get 30 + 9 = 39.
- The child can correctly answer questions such as 3 + 5 + 2, 27 + 12 and 65 – 29 with no jottings.
- The child can deduce that 20 + 70 = 90 and 42 + 37 = 79 from 2 + 7 = 9.

OBJECTIVE

- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; three one-digit numbers

Rising Stars Progression Framework: 2.2.b.1, 2.2.b.2, 2.2.e.1

RESOURCES

- Each child needs: a copy of Worksheet 10, cubes or counters and place-value cards as necessary, a pencil

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Worksheet 10

Name _____ Date _____

Addition and subtraction

Can you do these calculations using what you have learned about subtraction and addition?

18 – 12 = ☐

24 + 34 = ☐

32 – 11 = ☐

85 – 13 = ☐

87 + 12 = ☐

56 + 24 = ☐

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