Has difficulty in remembering number pairs totalling between ten and twenty, resulting in calculation errors

Opportunity for: finding patterns

Resources

- Number track with numbers 1 to 20
- Number cards 1–20 (Resource sheets 1 and 2)
- Coat-hanger and twenty pegs

Key vocabulary

number pair	added to
number partner	plus
number facts	equals
more than	makes
less than	pattern
add	goes up in ones/twos

Teaching activity

Time 15 minutes

'We are going to find some number patterns today. Starting from ten, we can find number pairs/partners such as five and five make ten.'

? Which other number pairs for ten do you know?

Follow on from what the child knows. With the child, count from one to twenty and back. Display the number track and point to a single-digit number, for example, seven.

? What do we add to seven to make nine?

Agree the answer is two.

? Now point to the number ten more than seven.

? What do we add to seventeen to make nineteen?

Agree the answer is again two.

Repeat, keeping the intervals small to help the child see the pattern.

> If the child cannot respond quickly, start with an interval of one, for example, four to five and fourteen to fifteen, etc. Increase the interval to two and three to establish the pattern. If necessary, count out the interval with the child.

Turn the number track over and repeat the questioning. Encourage the child to say the number statements aloud:

'Six add two is eight.
Sixteen add two is eighteen.'

Reveal the number track and the number cards. From the cards select a teens number, for example fourteen, and place this above the track. Point to thirteen on the number track.

? What do we add to thirteen to make fourteen?

Agree it is one. Place the card with 1 below the 13 on the track and with the child say aloud:
'Thirteen add one is fourteen.'

Point to 12 on the number track.

			14	
11	12	13		
3	2	1		
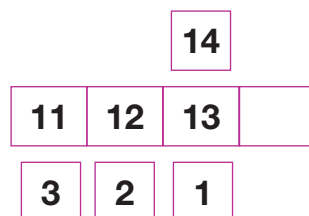
? What do we add to twelve to make fourteen?

Agree the answer is two. Place the card with 2 below the 12 on the track and recite the number statement together.

Repeat until the final statement has been made and ask the child to say the corresponding number statement:
'One add thirteen is fourteen.'

? What can you tell me about the numbers on the track and the numbers on the cards?

Encourage the child to explain the pattern, using their own words to describe the increase and decrease in the numbers.

Point to a number less than 14 on the track, for example 11, and with the child say the number statement:
'Eleven add three is fourteen.'

? What other statement could you make with these same numbers?

Establish that it could be: 'Three add eleven is fourteen.'

Repeat the two statements represented by the track and cards and remove the two number cards 3 and 11.

Select another number less than fourteen and repeat, each time removing the two number cards until only one is left.

Show the child the coat-hanger with fourteen pegs on it. With the child, count out a group of two pegs, and move them to the right.

? How many pegs are on the left?

Establish there are twelve pegs and with the child say aloud the two associated number statements, turning the coat-hanger around as you do. Repeat, forming other groups of pegs from the fourteen.

> If the child cannot identify the number of pegs in the group on the left, let them count out the pegs. Establish the number of pegs is twelve. Ask the child to find the 2 number card and place this card below the 12 on the number track and say aloud the statement: 'twelve add two is fourteen'.
>
> Turn the coat-hanger around and let the child place the 12 number card below the 2 and say the associated number statement aloud.
>
> Return the coat-hanger to the original position and move one more peg to the right. Ask the child to identify the number of pegs on the left and find and place the appropriate number card on the track. Repeat, building the pattern as before.

Shuffle the number cards 1 to 13, place them face down and ask the child to turn over the top card. The card revealed is, for example, 9.

> ? **What do we add to nine to make fourteen?**

Agree the answer is five, and ask the child to place the 9 below the 5 on the number track. Encourage the child to say aloud the statement represented by the track and the cards. Repeat until all the cards have been turned over.

> If the child cannot give the correct answer, give them the coat-hanger with the fourteen pegs to count out the groups of nine and five.

If time allows, repeat this activity choosing a different starting number.

'Let's write some number facts that it would be useful to remember.'

Spotlight 1

Has difficulty remembering number pairs totalling between ten and twenty, resulting in calculation errors

Opportunity for: communicating mathematics with symbols

· ·

One more than ten

Time 10–15 minutes

Resources

- Coat-hanger with eleven pegs
- Large sheet of paper

Key vocabulary

number pair	added to
number partner	plus
number facts	equals
more than	makes
less than	pattern
add	goes up in ones/twos

Teaching activity

Show the child the coat-hanger and together count out the group of eleven pegs. Move one peg to the right-hand side.

> ? **How many pegs are there altogether?**

Confirm that there are still eleven pegs. Point to the group on the left of the hanger.

> ? **How many pegs are there in this group?**

Confirm that there are ten pegs.

> If the child is wanting to count from one each time, you might need to do some more counting activities with the child (see *1 YR +/−*).

With the child, record the sum on the large sheet of paper.

$$11$$
$$10 + 1 = 11$$

Move another peg to the right.

? How many pegs are there altogether?

Agree that there are eleven. Point to the group on the right.

? How many pegs are in this group?

Agree that there are two.

? How many pegs are in this group?

Agree that there are nine, and ask the child to record 9 + 2 = 11 below the earlier statement.

Continue to move one peg to the right and identify and record the addition number statement each time, until one peg remains on the left-hand side.

Ask the child to describe the pattern in the written statements.

Together say the ten statements aloud: 'ten add one is eleven', and so on.

Now cover all but the top two statements and ask the child to say the ten statements aloud starting from 10 + 1 = 11. As they say them, reveal the statements.

Cover up all but the bottom three statements and ask the child to say the ten statements aloud starting from 1 + 10 = 11. Hide all the statements and ask the child to say them. Keeping the statements hidden, ask questions such as:

? Seven add what is eleven?

Give the child plenty of practice going over the statements and the pattern over the next few days, perhaps hanging up the coat-hanger and pegs with the number statements.

? What did you enjoy learning today?

? Do you think you are getting better at remembering number pairs?

Spotlight 2

Has difficulty remembering number pairs totalling between ten and twenty, resulting in calculation errors

Opportunity for: exploring relationships

· ·

Two more than ten

Time 10–15 minutes

Resources

- Large sheet of paper from Spotlight 1
- Bead string of twelve beads or cube 'train' of twelve cubes

Key vocabulary

number pair	plus
number partner	equals
number facts	makes
more than	pattern
less than	goes up in ones/twos
added to	

Teaching activity

'Today we are going to do some more work on number pairs like we did last time with eleven.'

Return to the list of addition number statements for eleven, and say them aloud together. Ask the child to do so with the list partially hidden, then completely hidden.

Show the twelve beads or cubes and ask the child how they might start a list of number pairs for twelve just like the list for eleven.

Follow on from what the child says.

Let the child split the beads or cubes to make the number pairs and you can record for them.

> 12
> 11 + 1 = 12

? **What comes next?**

Ask the child to move one more bead/cube to the right and confirm that the next number statement is 10 + 2 = 12.

> If the child has difficulty with this, encourage them to carry out each step using the beads, each time moving one more bead to the right. Emphasise the 'one more, one less' pattern in the groups formed and only count the beads in the group if the child cannot identify the changes in the numbers.

Once the list is complete let the child say each number statement. You might want to compare the patterns in this list with the patterns in the list for eleven in Spotlight 1.

Then ask the child to respond to you with the number pair or partner for twelve. For example:
If you say two the child must say ten.
If you say six the child must say six, each time making your number up to twelve.

Increase the speed at which you say your number, giving repeated practice with the numbers the child stumbles on.

? **Do you feel more confident with number pairs to twelve? Tell me some pairs you can remember.**

? **What would you like extra practice with?**

Now or at another time you might want to return to the lists of addition facts for eleven and twelve. Ask the child to say them quietly to themselves, then hide them and ask the child to say them aloud.

Spotlight 3

Has difficulty remembering number pairs totalling between ten and twenty, resulting in calculation errors

Opportunity for: seeing relationships

Patterns with twenty

Time 10–15 minutes

Resources

- Large sheet of paper from Spotlight 2
- Twenty counters or cubes
- Number cards 0–20 and +, − and = cards (Resource sheets 1, 2 and 8)

Key vocabulary

number pair	plus
number partner	equals
number facts	makes
more than	pattern
less than	goes up in ones/twos
added to	

Teaching activity

'We're going to do some more number partners today.'
Play 'number partners' with the child for a few minutes, first playing with ten.

? **What is the number partner of six when we are playing to ten?** *(Four)*

'Now we are going to play number partners with twenty.'

? **So if we play to twenty, what do you think will be the number partner of six?**

> Help the child to see the relationship of the numbers to ten and the numbers to twenty.
>
> $$10 = 6 + 4$$
>
> $$20 = 16 + 4$$

With the coat-hanger or straw bundles, help the child to show 11, then 12, then 13.

Go over a few examples, always making the link from ten to twenty.

> If the child needs support, use cubes or beads to make some of the number statements. You could make several 'ten trains' in red and have the units in blue to show the relationship clearly.

Play number partners to twenty again.

? **What if I asked you to tell me a number partner for nineteen? Can you think what might go with one to make nineteen?**

> If the child needs help with that you might want to record a 'one more' pattern like the ones in Spotlights 1 and 2, or work out the numbers with cube 'trains'.

'Let's play number partners to nineteen.
If I say eighteen you must say one.
If I say seven you must say twelve.'

Spotlight 4

Has difficulty remembering number pairs totalling between ten and twenty, resulting in calculation errors

Opportunity for: exploring patterns

∙∙

Carry on up

Time 10–15 minutes

Resources

● Cubes

Key vocabulary

number pair	plus
number partner	equals
number facts	makes
more than	pattern
less than	goes up in ones/twos
added to	

Teaching activity

'We are going to make some number pairs with eighteen today, but this time we are going to think about subtraction pairs as well as addition pairs.'

Ask the child to make a cube 'train' of ten red cubes and eight blue ones.

? **Can you think of a subtraction calculation with eighteen?**

> If the child needs help you might suggest taking away just one cube.
>
> **?** **What is eighteen take away one?**

$$18 - 1 = 17$$
$$18 - 2 = 16$$
$$18 - 3 = 15$$

> Help the child to talk about the pattern as it develops.
>
> **?** **What is one less than sixteen?**
>
> **?** **Can you see patterns in the numbers? Tell me about them.**

When the list gets to eighteen subtract eighteen, explore where a zero could have fitted in at the start of the pattern, that is $18 - 0 = 18$.

Then ask the child to say some number partners for eighteen using addition facts, for example if $18 - 2 = 16$, then $16 + 2 = 18$.

Play number partners to eighteen.
If you say six the child must say twelve.

Give help in finding more patterns by asking questions in reverse. So for example, if you say two and the child says sixteen, you then say sixteen so the child will say two.

To give the child extra practice you could put up some of the lists of facts for the child to read through each day, or you could find odd moments to play 'number partners'.

? **How could learning number facts like this help you to get more of your calculations right?**

? **Do you know any other number patterns? Tell me about them.**

Spotlight 5: a learning check

Has difficulty remembering number pairs totalling between ten and twenty, resulting in calculation errors

Opportunity for: discussing and explaining

● ●

Shout it out

Time 5–15 minutes

Resources

● Two sets of number cards 5–10 (Resource sheet 1)
● Two bags
● Two children

Check: does the child use key vocabulary?

number pair	added to
number partner	plus
number facts	equals
more than	makes
less than	pattern
add	goes up in ones/twos

Teaching activity

'This game, **Shout it out**, will help you to practise some of the number pairs we have been working on.'

You might want to give the child you have been working with some preliminary work with the game so that when another child joins in, the child is more confident and therefore more likely to experience success.

Put one set of cards 5–10 in one bag and the second set in the second bag.

How to play

1. You take a number from each bag, concealing the numbers until you can turn them over so that both children can see them at the same time.

2. The children add the numbers mentally and shout out the number. If they are right they win ten points. (If both children are right, they can both win ten points. You don't need to play the game too competitively.)

3. Put the number cards back in the bags.

Variations

● Play with two dice numbered 5–10.
● An easier game is to play with two 1–6 dice.
● Play the game the other way around. You show or say one number up to twenty, such as eighteen, and pairs of children can cooperate to make a number sentence to eighteen. This could be addition or subtraction.
● Choose a number, such as eighteen, then the child throws a dice and subtracts that number, shouting out the answer.

Learning outcomes

By the end of this set of activities children should be able to:

● tackle related learning tasks with increased motivation and confidence;

● use and understand connected mathematical vocabulary;

● remember number facts of pairs totalling up to twenty;

● see relationships between number patterns and use those patterns to help with calculating.

Number pairs

Has difficulty in remembering number pairs totalling between ten and twenty, resulting in calculation errors

Resources

- Blank loop track (Resource sheet 21)
- Dice, number cards or spinners (Resource sheet 13)
- Cubes
- Counters
- Stop watch
- Number lines
- At least two children

Check: does the child use key vocabulary?

number pair	add both numbers
add	makes
plus	equals
how many altogether?	

Teaching activity

'Today we are going to play a game, **Number pairs**, to help you to remember number pairs between ten and twenty. Let's look carefully at our spinners and look at the numbers we are going to add together.'

Select dice, spinners or cards to practise the numbers appropriate for the child, for example hexagon spinners from Resource sheet 13 could be filled in with numbers from 4 to 9 so that when two numbers are added together they make totals between 8 and 18.

Prepare the blank loop track (Resource sheet 21), perhaps with some coloured stickers or decoration to fit with the child's interests or a class theme.

Children can cooperate to play this game, and they can time themselves aiming to get quicker as they have more practice.

How to play

1. Each player or pair puts their counter on the starting position. Timing can be started using the stop watch if appropriate, perhaps timing how long it takes to go three times round the track.
2. The first player or pair spins two numbers, maybe 7 and 6. They try to add these numbers in their heads, or use a number line or cubes as support.
3. The total of the two numbers represents the counter move on the track.
4. Then the other players spin two numbers and make their moves, and so on.
5. After three circuits have been completed, the time taken can be recorded. The next time, players can aim to achieve three circuits more quickly.

Variations

- Race around the track three times to see who is first.
- Play with harder numbers, making pairs up to twenty.
- Play with another spinner and add three numbers each time.