

## Counts up unreliably; still counting the smaller number to get one too many in the answer

### Opportunity for: developing mathematical language

#### Resources

- Number lines or tracks, or a game board such as Ludo, including a number track
- Dice and counters
- Cubes

#### Key vocabulary

count on	one step forward
count up	same number
count back	one more
count down	how many steps
next one	

(Note: Many children, even those who seem to achieve above average, have the problem of sometimes counting the space they are on when they count along a number track or line. This error often will not show up in written work. It can be identified by observing children carefully as they play track games such as Ludo.)

#### Teaching activity

Time 10–15 minutes

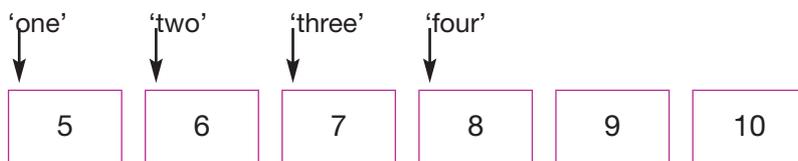
Explain to the child that you have noticed that they often get some addition and subtraction calculations wrong, often by one, and you are going to help them to work out what it is that they are doing wrong.

Using a number line or track, or a game board including a number track, ask the child to put a counter on a number and to count on the number of a dice throw.

**?** If you stand on four and the dice throw is three, how many do you have to count on?

Observe the child very carefully. You might need to let the child try several dice throws to check if they can count on consistently without counting the space they are on.

For example, a counter on five and a dice throw of four can mean that the child counts:



This will result in an answer of one less than five add four, but the child can be unaware of their error and, if games are played totally unsupervised, the error can get compounded repeatedly.

If the child is making this kind of counting-on error, encourage them to use some kind of number track or game and to make two of their fingers into a 'little person with two legs'. (Or do this activity outside on a playground number track.)

They 'stand' on a position such as four and you then tell them to 'take two steps'. They count 'one step' as they take one step with their fingers to 5.

Then their fingers take a second step to six.

'Four and two more is six.'

Emphasise: 'Don't count the position you are on! "Take one step" means to move to the next position!'

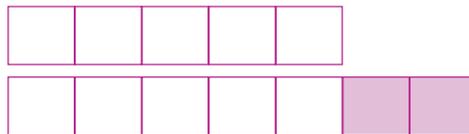


Try putting some counting-on tasks in different words.

- ? How many hops from four to seven?**
- ? If I stand my fingers on eight and count on two, which number do I end on?**
- ? What if I stay on ten and count back two?**
- ? If I am on six and I add on two, which number will I end up on?**
- ? What is one more than seven?**

If the child needs more help with a wider range of words for counting on, note that for another time but move on.

With some cube 'trains', compare two numbers.



- ? What is the difference between seven and five?**

Help the child to identify the two cubes that make the difference.

Count the cubes carefully.

- ? Which number is more, seven or five?**
- ? How do you know?**
- ? How many more?**

Return to a number track.

'Put your counter/fingers on five and take two steps.'

'So you didn't count the fifth cube because that was the number you were on.'

- ? Did you land on 7?**

**? Can you make a number sentence about five and seven?**

Record with the child some of the number sentences used in the session.

Five count on two is seven.  
 The difference between five and seven is two.  
 There are two steps from five to seven.

**? What did you learn today about counting on and taking steps along a number line?**

**? Have you worked out why sometimes your answers are wrong?**

**? Why do think this might be?**



You might want to send some mathematics games home to play with parents or carers, or encourage any kind of board game. Alert parents or carers to watch out for 'counting the position they are on'.

## Spotlight 1

Counts up unreliably; still counting the smaller number to get one too many in the answer

**Opportunity for: developing mental images**



### The penny has dropped

Time 10–15 minutes

**Resources**

- Number track or line or *Space hops* (Resource sheet 11a)
- 1p coins and a tin tray
- Number cards (Resource sheet 1)
- *Count on cards* (Resource sheet 10)

**Key vocabulary**

- count on
- count up
- count back
- count down
- next one
- one step forward
- same number
- one more
- how many steps

**Teaching activity**

'We are going to do some more work with counting on so that you will find out more about why you sometimes get wrong answers when you are counting on.'

Let the child take a number card and 'stand' on that number. They should take a Count on card.

5

Count on 4



5

6

7

8

9

10

11

As the child counts on four and moves their fingers, you drop a penny on the tin tray, one penny for each 'step' they take.

(If you are doing this outside, you could use a drum beat for each step.)

Emphasise the match between one step and one coin dropping.

For most children it is taking that first step to the next number that is the focus of the problem. Emphasise that, as they hear the penny drop, they must take a step.

'Remember not to count one and stay on the same position!'

'When you count one that means you take one step!'

Do a few more examples.

'Let's make a picture of what we have done today.'

If the child is still having problems, you might find that allowing them to record what they have done in their own way can give both you and them insight into their conceptual error and their mental images.

Alongside the child's recording you might want to write some of the sentences you have used in this session, and maybe stick the child's picture onto the recording to keep for next time, so that you can build on their mental images.

7 count on 4 is 11.

1 step more than 8 is 9.

To get from 3 to 6 you have to take 3 steps.

# Spotlight 2

Counts up unreliably; still counting the smaller number to get one too many in the answer

**Opportunity for: developing mathematical language**

## Don't count where you stand!

**Time** 10 minutes

### Resources

- Large foam number tiles or sheets of A4 paper
- *Count on cards* (Resource sheet 10)
- Number cards (Resource sheet 1) or dice

### Key vocabulary

- |            |                  |
|------------|------------------|
| count on   | one step forward |
| count up   | same number      |
| count back | one more         |
| count down | how many steps?  |
| next one   | add one          |

### Teaching activity

Make a number track on the floor with the paper (or do this activity outside on a painted or chalk number track).

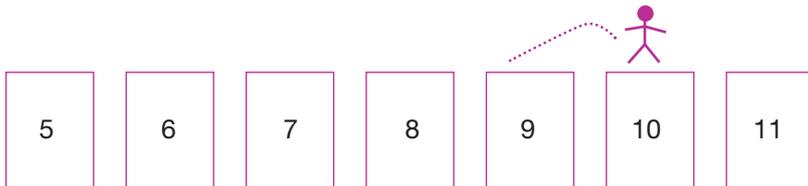
'Today we are going to do some adding and counting on again, so that you can practise taking the right number of steps when you count on.'

**? Can you remember what it is that you might be doing wrong when you count on?**

**? What is the special thing about the first number you count on? (The child should realise that they must take a step when they count on one.)**

Let the child take a number card or throw the dice to see which number they stand on, for example, 9.

Show them the Count on 1 card and ask them to do what the card says.



'Nine count on one is ten.'

'Nine add on one is ten.'

If the child does not move onto space ten when they count on one, you will need to repeat the activity with several different numbers.

Relate what they are doing to adding one.

'Stand on nine and add one.'

**? How much more than nine is ten?**

Encourage the child to identify what it is that they sometimes do wrong, for example they stay on the number 9 and say 'Count on one' and so on.

**? How could you check that nine count on one is ten?**

Encourage the child to check using a different method, for example counting on their fingers.

Once the child is confidently adding one, use a wider range of Count on cards, and continue to use a wide range of vocabulary.

- ? If you stand on six and the card says 'Count on 2', how many steps do you have to take?**
- ? How can you check that you are right?**
- ? So do you think you counted on correctly from six?**

If the child is still counting the number they were standing on at the start, you could relate the counting on to counting on fingers to try to show the child that they are miscounting.

Go back to taking just one step, then try just two steps, then three steps, and so on.

- ? Is eight more than three?**
- ? How many more?**
- ? How did you work that out?**
- ? Is there another way to do that?**

If the child does not refer to counting up from three to eight, remind them how to do that.

- ? How do you think you are doing with this counting on? Do you think you are now getting more calculations right?**
- ? What do you think helps you to get correct answers?**

# Spotlight 3

Counts up unreliably; still counting the smaller number to get one too many in the answer

## Opportunity for: reasoning about numbers



### Land on 10

Time 10–15 minutes

#### Resources

- Floor or playground number line
- *Count on cards* (Resource sheet 10)

#### Key vocabulary

- |            |                  |
|------------|------------------|
| count on   | one step forward |
| count up   | same number      |
| count back | one more         |
| count down | how many steps?  |
| next one   |                  |

#### Teaching activity

‘We are going to play a game called **Land on 10** today. It’s about counting on the right number. You are going to get really good at counting on!’

Ask the child to take a face-down Count on card, for example Count on 3. Then tell the child to stand on position 7 (because you want the child to end up on position 10).

**? Which number do you think you will end up on when you work out seven count on three?**

Ask the child to count on three.

If the child is still counting the position they are on, they will not land on 10 but 9 when they ‘count on three’. Repeat the seven count on three, showing them their mistake.

‘Count on three or add three means you must take three steps. Don’t count the one you start on!’

Repeat the activity. For example, if the child takes the Count on 1 card, you should ask them to stand on 9. Keep giving rewards for ending up on 10.

**? How do I know which number to tell you to stand on?**

**? If you take the Count on 5 card, where should I tell you to stand?**

**? How do you know that?**

You might want to give the child some experience of using other models for counting on, such as fingers, number lines, or 100-squares.

(*Note:* 100-squares can be unsuitable for counting on because of the difficulties that children find with going from the end of one line to the start of another. 100-squares are ideal for counting on ten, or nine by counting on ten and hopping back one, and so on. But if children are regularly encouraged to do counting on using a 100-square, they tend to make errors. Number lines are much more efficient.)

**? How many steps from six to ten?**

**? What if you count back from ten to six, how many steps?**

**? What is really important to remember for our next session?**

## Spotlight 4

Counts up unreliably; still counting the smaller number to get one too many in the answer

### Opportunity for: using mathematical language



### Cube jumps

Time 10–15 minutes

#### Resources

- Number cards (Resource sheet 1)
- Cubes in 'trains' to go with the number cards
- Character toys (or use counters or fingers)

#### Key vocabulary

- |            |                    |
|------------|--------------------|
| count on   | one step forward   |
| count up   | same number        |
| count back | one more           |
| count down | how many steps?    |
| next one   | difference between |

#### Teaching activity

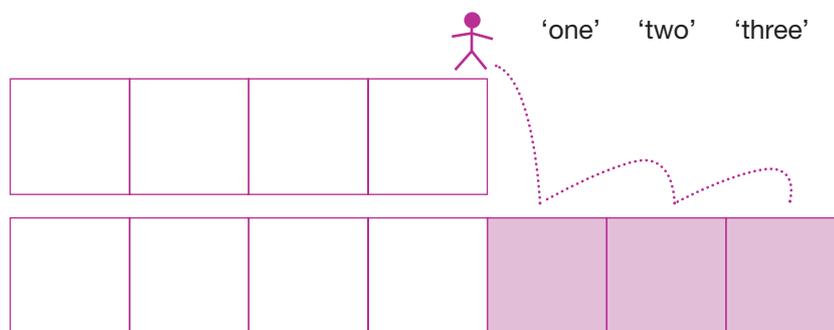
(Note: You can start with the cubes in number 'trains' to match the number cards you are using, but if you want to check the child's counting skills, make the cube 'trains' at the start of the activity.)

'Today we are going to find the difference between two numbers by counting up from the smaller number to the larger one.'

Ask the child to take two number cards, for example four and seven, and put appropriate cube 'trains' next to each other.

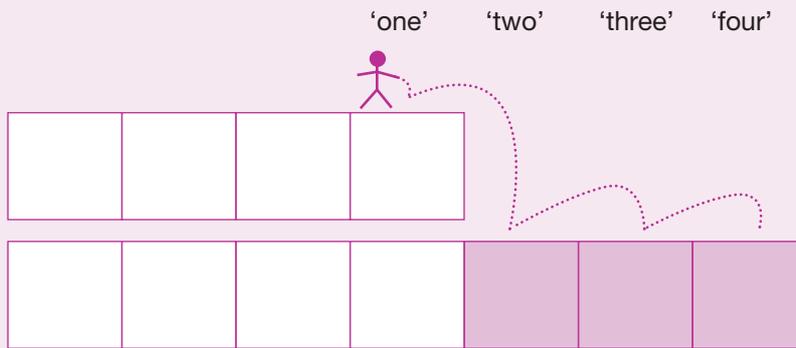
Then they put their toy on the smaller number, four in this example, and count on how many steps to get to the larger number. Or they could count with two fingers, as in previous Spotlights.

#### ? How many steps to get from four to seven?



'Four count on three is seven.'

If the child continues to make the error of including their starting position in the count, it might help if you or the child drew the steps that they took when they made an incorrect answer; for example, they might have jumped like this:



'Look, you did four hops. From four to seven should only be three hops.'

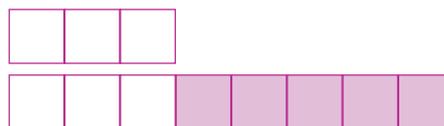
Go over the correct way to count up, as shown on page 7.

Repeat the activity with more numbers, for example two and five.

- ? Which is the smaller number, two or five?**
- ? So when we count up from the smaller number to get to the larger number, which number do we start on?**
- ? Which number do we end on?**
- ? How many steps is it to get from two to five?**
- ? How do you know you are right?**

'Show me the difference between three and eight.'

'Break off the difference.'



If the child needs a bit more experience of this, make 'trains' in two different colours, for example, yellow for the first smaller number, then a yellow 'train' exactly the same and a blue 'difference', and put these on display in class.

Label the cubes. For example: 'The difference between two and seven is five.'

Some children are helped to understand difference by comparing ages. For example: 'You are nine and Sophie is seven. What is the difference in your ages?'

Make sure the child can count up on a number line.

- ? Can you show me how to count up from six to nine?**
- ? How many steps did you take?**

- ? What is the difference between six and nine?
- ? If you count back from nine to six, how many steps do you take? (*Three.*)
- ? What is important to remember for next time?

## Spotlight 5: a learning check

Counts up unreliably; still counting the smaller number to get one too many in the answer

### Opportunity for: discussing and explaining

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### Space hops

Time 10–20 minutes

#### Resources

- Space hops (Resource sheet 11a)
- At least one other child
- Count on cards (Resource sheet 10)
- Rewards
- Counters or small world astronauts

#### Check: does the child use key vocabulary?

- |            |                    |
|------------|--------------------|
| count on   | one step forward   |
| count up   | same number        |
| count back | one more           |
| count down | how many steps?    |
| next one   | difference between |

#### Teaching activity

This could be a playground game if you paint or chalk a track.

#### How to play

1. With some Count on cards face down, let the child start with their counter on the first planet (you can call this 'zero' to introduce this idea to the children) and choose a card to count on, for example, Count on 6.
2. Each player, every turn, must say how many steps they are going to take: 'I'm going to take six steps.' Then everyone should watch them very carefully.
3. If the player takes six steps correctly and lands on the right number, they can stay there. If they count incorrectly, they should go back to the space they started on!
4. Encourage children to challenge each other. For example, 'You were on the planet and you counted on six but you landed on 5, so you were wrong, you should have landed on 6.'
5. Players take turns to take a Count on card like this until someone gets to the planet at the end. That person then wins a reward.

**? You've had two turns now, add on four and add on three. So how do you know you have taken the right number of steps if you are now on 7?**

#### Variations

- Play with a wide range of cards, for example: Add on 3, Count up 4, Count 3 more, Jump on 5 and so on (reminding children that 'count up' means counting up to higher numbers, not necessarily counting by moving up the page or up a number line).
- ↑ ● Play with a mixture of Count on and a few Count back cards (using just small numbers for these). If a child has to count back and gets beyond zero, you can ask the child where they think their counter should stand. Some children can surprise us with their understanding of negative numbers. If a child isn't ready for that, just ask them to sit in the first spaceship until their next turn.
- ↑ ● Play so that you have to predict the number which you are going to land on. 'I'm on 3 and I have to count up six, so I predict I will land on 9, because if I count three add six on my fingers I get to 9.' If a player predicts correctly, they move on one more step.

**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;
- count on from a smaller number to a larger one accurately;
- identify any errors they are making and develop the confidence to check their own work.