

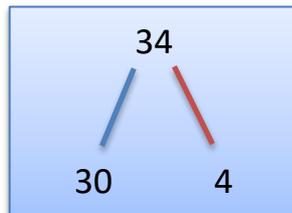
Split and add

Activity 1

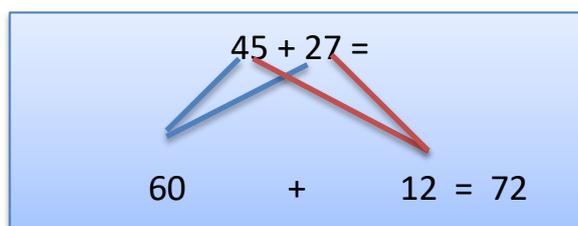
Focus of activity: Adding 2-digit numbers using partitioning

Working together: conceptual understanding

- Lay out plenty of 10p and 1p coins in the centre of the table.
- Give each child a set of place value cards (10s and 1s) and a mini-whiteboard and pen.
- Use a random number generator to create a 2-digit number less than 50.
- Ask chn to collect the matching number of 10ps and 1ps.
- Chn then partition the number on their whiteboards like this:



- Repeat this for at least six different numbers, ensuring that chn are confident partitioning the numbers.
- Generate two random numbers less than 50, e.g. 27 and 45.
- Ask one child in each pair to make one number using coins, and the other child in each pair to make the second number using coins.
- Chn write the addition on their boards, putting the larger number first, e.g. $45 + 27$.
- Each pair of chn now creates both numbers using PV cards. Do they agree?
- Ask one child in each pair (preferably on the left as they see it) to collect the 10s cards and the other child to collect the 1s cards.
- Ask chn to add the 10s, starting with the larger number. *Do we agree the total?*
- Add the 1s. *Do we agree the total?*
- Add the two totals.
- Record the addition using two different colours for the lines as shown. Stress that we collected up the 10s and 1s.



- Check the total by counting the combined numbers of coins.
- Repeat this for at least eight pairs of randomly generated numbers less than 50. Ensure that chn are confident with the process.

Up for a challenge?

Write the following numbers on a large piece of paper so that all children can see them: 23, 28, 21, 27, 26. Choose two numbers which you think will have a total LESS than 50. Now choose two numbers you think will have a total MORE than 50. How did you know? Draw out looking at whether the 1s digits total more than 10 or not.

Now it's the children's turn:

- Chn work in pairs. Ask each child to shuffle the 10 to 50 cards from their set of place value cards and place face down. They shuffle the 1s cards from the same set of place value cards and place face down.
- They each take the top card from each pile and put them together to make a 2-digit number.
- Chn in each pair record the addition of their two numbers.
- One child in each pair collects the 10s cards, and the other collects the 1s cards. They add the 10s, add the 1s, then find the combined total, recording the addition as above in their books.
- Repeat at least four more times.
- Go round the group and mark their additions as they do them, e.g. initially after two examples.

S-t-r-e-t-c-h:

If chn cope well, ask them to use all the 10s cards, not just those from 10 to 50.

Things to remember

Remember that when we add a pair of 2-digit numbers, we can add the 10s, add the 1s, then add these two numbers together. Often when we add the 1s, we end up with an extra 10! Ask chn to give an example where this happened, reading from their books.

You may want to add something that has emerged from the activity. This may refer to misconceptions or mistakes made.

Resources	Outcomes
<ul style="list-style-type: none">• 10ps and 1ps (real money not plastic)• Place value cards: 10s and 1s• Random number generator (could use Google)• Mini whiteboards and pens	<ol style="list-style-type: none">1. Chn can partition 2-digit numbers with confidence.2. Chn can add two 2-digit numbers by partitioning (totals less than 100).3. Chn begin to add two 2-digit numbers by partitioning (totals more than 100).

Split and add

Activity 1

Work in pairs

Things you will need:

- A set of 10s and 1s place value cards



What to do:

- Shuffle the 10 to 50 cards. Place them face down.
- Shuffle the 1s cards and place face down.
- Each take the top card from each pile and put them together to make a 2-digit number.



- Record the addition of your two numbers – not the answer yet!
- One person collects the 10s cards, and the other collects the 1s cards.
- Add the 10s. Add the 1s. Find the combined total.
- Record the addition in your books.
- Repeat at least four more times.

$34 + 27 =$

$50 + 11 = 61$

S-t-r-e-t-c-h:

Shuffle ALL the 10s cards not just 10 to 50. Use them all!

Learning outcomes:

- I can partition 2-digit numbers.
- I can add two 2-digit numbers using partitioning (total less than 100).
- I am beginning to add two 2-digit numbers using partitioning (total more than 100).

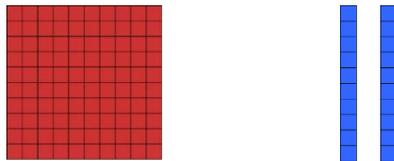
Collect 'em up!

Activity 2

Focus of activity: Adding 2-digit numbers using partitioning (total more than 100); Beginning to add 3-digit numbers (total less than 1000)

Working together: conceptual understanding

- Give each child a set of place value cards (100s, 10s and 1s) and a mini-whiteboard and pen.
- Show the cards 70 and 50 and ask children to add these two numbers together. If children struggle, suggest that they count on in 10s from 70, keeping track of each 10 counted on, on their fingers. Make 70 and 50 using base 10 equipment. *We have twelve 10s. How many 10s make a 100?* Swap ten 10s for a 100 block and show that the answer is one hundred and twenty.



- Ask children to work in pairs to use the place value cards to make 72 and 53, and write $72 + 53$ on their whiteboards.
- One child in each pair collects the 10s cards, and the other collects the 1s cards. They each say their total (120 and 5). *What is 120 add 5?* Make this number with place value cards.
- Remind children how we can use a jotting to keep track of our steps when adding numbers.

$$\begin{array}{r} 72 + 53 = \\ \swarrow \quad \searrow \\ 120 \quad + \quad 5 = 125 \end{array}$$

- Ask children to work out $78 + 57$ and $85 + 36$ using place value cards and/or jottings. Support them in adding 10s using base 10 equipment if necessary.

Up for a challenge?

Write the following numbers on a large piece of paper so that all children can see them: 53, 38, 81, 27, 56. *Choose two numbers which you think will have a total LESS than 100. Now choose two numbers you think will have a total MORE than 100. How did you know?* Draw out looking at whether the 10s come to more than 100 or not.

Ask each pair to make 453 and 232. Say that we can add 3-digit numbers in much the same way as they added 2-digit numbers. Ask them to collect the 100s together, the 10s, and the 1s, finding the total of each. Show children how to make a jotting.

Repeat with $457 + 238$ (1s come to > 10).

$$\begin{array}{r} 453 + 232 = \\ \swarrow \quad \searrow \\ 600 \quad + \quad 80 \quad + \quad 5 = 685 \end{array}$$

Now it's the children's turn:

- Chn work in pairs. Ask each child to shuffle the 50 to 90 cards from their set of place value cards and place face down. They shuffle the 1s cards from the same set of place value cards and place face down.
- They each take the top card from each pile and put them together to make a 2-digit number.
- Chn in each pair record the addition of their two numbers.
- One child in each pair collects the 10s cards, and the other collects the 1s cards. They add the 10s, add the 1s, then find the combined total, recording the addition as above in their books.
- Repeat at least three more times.
- Go round the group and mark their additions as they do them, e.g. initially after two examples.
- Repeat, but this time children shuffle the 100 to 400 cards, 10 to 40 cards and 1 to 9 cards and each make a 3-digit number. They collect the 100s, 10s and 1s, then find the combined total, recording the addition in their books.
- Repeat at least two more times.
- Go round the group and mark their additions as they do them.

S-t-r-e-t-c-h:

If chn cope well, ask them to include the 50 to 90 cards.

Things to remember

Remember that when we add a pair of 2-digit numbers, we can add the 10s, add the 1s, then add these two numbers together. Often when we add the 10s, we end up with a number bigger than 100! When we add a pair of 3-digit numbers, we can add the 100s, add the 10s, add the 1s, then add these three numbers together. Often when we add the 1s, we end up with an extra 10 to add! Ask chn to give an example where this happened, reading from their books.

You may want to add something that has emerged from the activity. This may refer to misconceptions or mistakes made.

Resources	Outcomes
<ul style="list-style-type: none">• Place value cards: 100s, 10s and 1s• Base 10 equipment (Dienes)• Mini whiteboards and pens	<ol style="list-style-type: none">1. Chn can add any pair of 2-digit numbers by partitioning (including totals more than 100).2. Chn begin to add pairs of 3-digit numbers (totals less than 1000).

Collect 'em up

Activity 2

Work in pairs

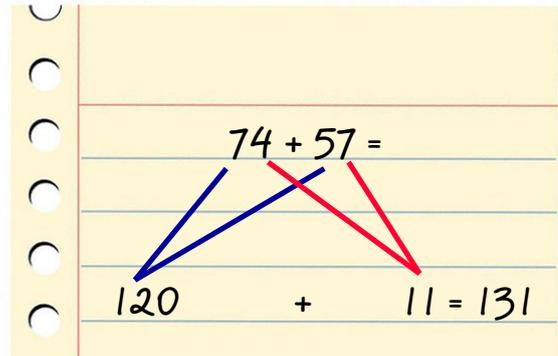
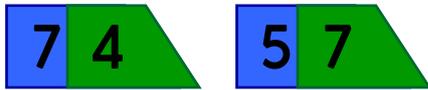
Things you will need:

- A set of 100s, 10s and 1s place value cards

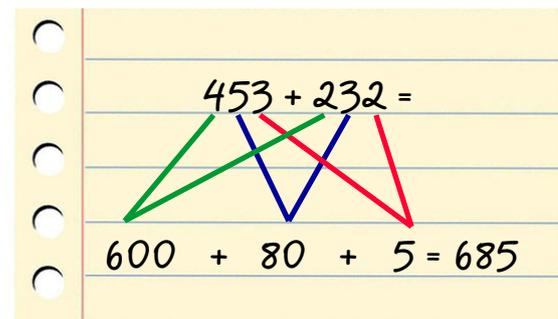


What to do:

- Shuffle the 50 to 90 cards. Place them face down.
- Shuffle the 1s cards and place face down.
- Each take the top card from each pile and put them together to make a 2-digit number.



- Record the addition of your two numbers – not the answer yet!
 - One person collects the 10s cards, and the other collects the 1s cards.
 - Add the 10s. Add the 1s. Find the combined total.
 - Record the addition in your books.
 - Repeat at least three more times.
 - Repeat, but this time shuffle the 100 to 400 cards, 10 to 40 cards and 1 to 9 cards.
 - Each take the top card from each pile and put them together to make a 3-digit number. Record the addition.
 - Collect the 100s, 10s and 1s. Find the combined total. Record the addition in your books.
- Repeat at least two more times.



S-t-r-e-t-c-h:

Shuffle ALL the 10s cards not just 10 to 50. Use them all!

Learning outcomes:

- I can add any pair of 2-digit numbers.
- I am beginning to add pairs of 3-digit numbers.