

Partitioning 1: using multiples of 10 and 100

It is important for pupils to know that numbers can be partitioned into, for example, hundreds, tens and ones, so that $326 = 300 + 20 + 6$. In this way, numbers are seen as wholes, rather than as a collection of single digits in columns. This way of partitioning numbers can be a useful strategy for addition and subtraction. Both of the numbers involved can be partitioned in this way, although it is often helpful to keep the first number as it is and to partition just the second number.

Expectations leading up to national curriculum level 5

$30 + 47$	$= 30 + 40 + 7$
$78 - 40$	$= 70 - 40 + 8$
$25 + 14$	$= 20 + 5 + 10 + 4$ $= 20 + 10 + 5 + 4$
$23 + 45$	$= 40 + 5 + 20 + 3$ $= 40 + 20 + 5 + 3$
$68 - 32$	$= 60 + 8 - 30 - 2$ $= 60 - 30 + 8 - 2$
$55 + 37$	$= 55 + 30 + 7$ $= 85 + 7$
$365 - 40$	$= 300 + 60 + 5 - 40$ $= 300 + 60 - 40 + 5$
$43 + 28 + 51$	$= 40 + 3 + 20 + 8 + 50 + 1$ $= 40 + 20 + 50 + 3 + 8 + 1$
$5.6 + 3.7$	$= 5.6 + 3 + 0.7$ $= 8.6 + 0.7$
$4.7 - 3.5$	$= 4.7 - 3 - 0.5$
$540 + 280$	$= 540 + 200 + 80$
$276 - 153$	$= 276 - 100 - 50 - 3$

Activities

Use a dice marked 1, 1, 10, 10, 100, 100 for the game 'target 500' with a group of pupils. Each player may roll the dice as many times as they wish, adding the score from each roll and aiming at the target of 500. They must not overshoot. If they do, they go bust!

For example, a sequence of rolls may be:

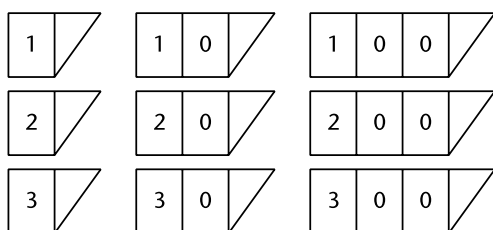
10, 10, 1, 100, 1, 100, 100, 1, 1, 10, 100

At this point, with a total of 434, a player might decide not to risk another roll (in case 100 is rolled) and stop, or to hope for another 10.

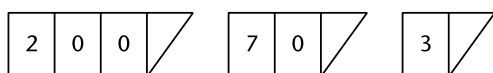
The winner is the player who gets nearest to 500.

This game practises building up numbers by mental addition using ones, tens and hundreds.

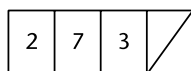
Use place value cards 1 to 9, 10 to 90 and 100 to 900:



Ask pupils to use the cards to make a two-digit or a three-digit number by selecting the cards and placing them on top of each other. For example, to make 273, the cards

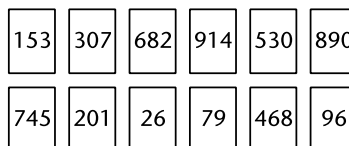


can be placed over each other to make



This could be used as a class activity, in which case you could ask individual pupils to select the appropriate card and to put it in the correct place. Alternatively, it could be used with individuals as a diagnostic task, to check whether they understand place value in this context.

With a group of three to five players, play a game using the place value cards 1 to 9, 10 to 90 and 100 to 900. You also need a set of two- and three-digit number cards to use as target numbers, for example:



Put the target numbers in a pile and turn them over, one by one, to set a target. Deal the 27 place value cards between the players.

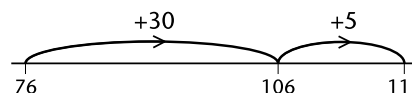
Player A inspects their cards to see if they have any part of the target number. If so, they put it on the table.

Play continues anticlockwise. Player B checks to see whether they have another part of the number, followed by players C, D, and so on. Whoever completes the target number keeps it. The winner is the player who wins the most target numbers.

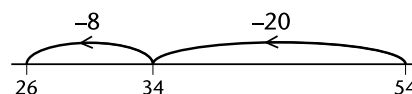
Games like this give motivating practice in partitioning numbers into hundreds, tens and ones.

Use the empty number line to add or subtract two-digit numbers, for example:

$76 + 35$:



or $54 - 28$:



Empty number lines are a useful way to record how pupils use multiples of 10 or 100 to add or subtract. They allow pupils to discuss different methods and encourage the use of more efficient methods.