

Place Value and Regrouping

Key NC Statement

Recognise the place value of each digit in a three-digit number (hundreds, tens and ones)

Related NC Statements

- identify, represent and estimate numbers using different representations
- compare and order numbers up to 1000
- read and write numbers up to 1000 in numerals and in words
- solve number problems and practical problems involving these ideas

Key Concepts

Pupils should explore the relative size of whole numbers building on concepts learnt so far in KS1. They should be provided with a variety of opportunities to represent numbers in different ways using resources, pictorially, using language and symbols. These opportunities allow pupils to experience playful regrouping (partitioning) to strengthen their understanding of place value. For example, 213 can be represented as 2 hundreds, 1 ten and 3 ones, as 1 hundred, 11 tens and 3 ones and it can also be represented as 21 tens and 3 ones. This supports the understanding that we can regroup 10 tens as 1 hundred etc. Pupils should experience numbers with 0 in and begin to demonstrate their understanding of 0 as a placeholder.

Pupils can then build on this understanding to notice what changes and what does not when they count in tens from a given number.

Steps within the Learning Sequence








Step 1: 10 ones are equal to 1 ten and 10 tens are equal to 1 hundred

Step 2: Comparing representations of 3-digit numbers

Step 3: Varying the order and practice

Step 4: Regrouping 3-digit numbers flexibly

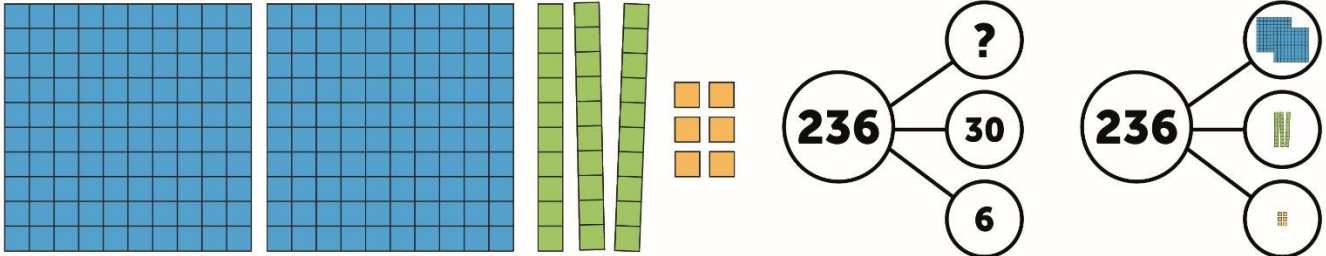
Step 5: Securing equality (for example 3 hundreds are equal to 30 tens and 300 ones)

| Destination Questions  | | |
|--|--|---|
| <p>1 </p> <p>What's the same and what's different?</p> <p>718 781</p> | <p>2 </p> <p>$\square + 30 + 1 = 731$</p> <p>$449 = 400 + \square + 40$</p> | <p>3 </p> <p>863</p> <p>\square hundreds, \square tens and \square ones.</p> |
| <p>4 </p> <p>Build it, draw it, say it, write it.</p> <p>Regroup 392 in three different ways.</p> | <p>5 </p> <p>True or False</p> <p>354 can be made from 35 tens and 4 ones.</p> | <p>6 </p> <p>I am thinking of a three-digit number.</p> <p>The sum of the digits is 15.</p> <p>The tens digit is twice the ones digit.</p> <p>What is my number?</p> |

Step one

10 ones are equal to 1 ten and 10 tens are equal to 1 hundred

Grouping hundreds, tens and ones drawing out the concept that ten ones are equal to a unit of one ten and ten tens are equal to a unit of one hundred.



I can see 2 hundreds, 3 tens and 6 ones.

$$200 + 30 + 6$$

Two hundred and thirty-six is also six more than 230.

Pupils build, draw, say and write three-digit numbers including those with zeroes used as a place holder.

3 

863

hundreds, tens and ones.

hundreds, tens and
 ones.

$$\square + \square + \square = \square$$

Step two

Comparing representations of 3-digit numbers

Using the digits 0-3, make a 3-digit number.

Check that pupils can read the number correctly especially if zero has been used as place value holder.

Provide the pupils with a range of resources to build the numbers:

- Beadstrings
- PV arrow cards
- Base-10
- PV chart

Ask pupils to make the number with each piece of equipment.

Discuss 'What is the same and what is different?' about the different representations including those with the same digits.



What's the same and what's different? 718 781

Activities for exploring ideas at greater depth

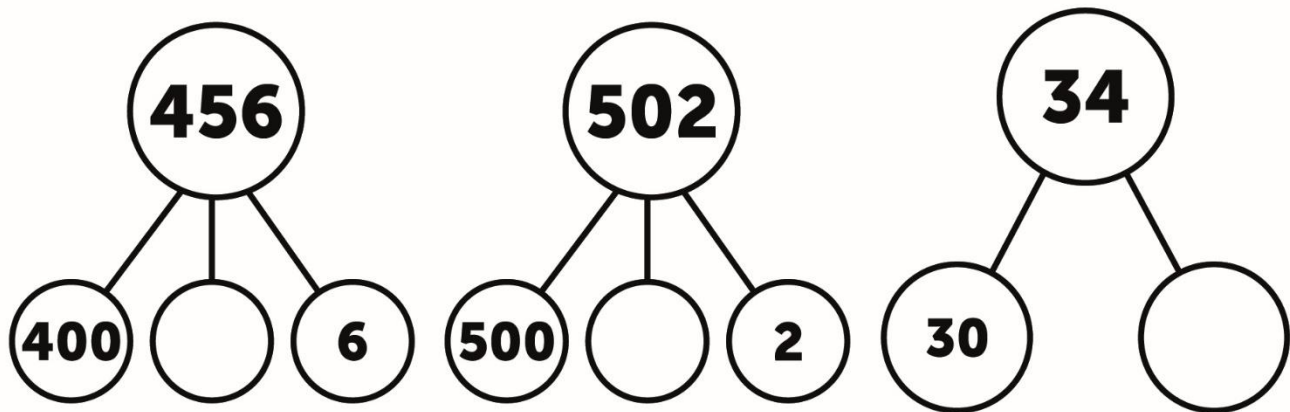
I made a 3-digit number from 37 pieces of base-10.

What numbers could I have made?

Step three

Varying the order and practice

Reinforce understanding through varied practice including examples where zero is used as a place value holder. Concrete resources such as base-10 and beadstrings should be available and pupils should also be able to record thinking in a part whole model as below or a bar model.



Write the missing number of tens and ones.

Write the value of '4' in the following numbers:

435cm, 249ml, 940m, 784cm, 3459g

Find the value of the missing numbers.

$$\square = 600 + 70 + 4$$

$$745 = \square + 40 + 5$$

$$806 = 800 + \square + 6$$

$$\square + 30 + 1 = 731$$

$$449 = 400 + \square + 40$$

Write the number that is:

- Three hundreds, four tens and seven ones
- Six hundreds, three tens and five ones
- Three tens, five hundreds and one
- Nine ones, seven tens and five hundreds
- Eight more than zero tens and four hundreds



$$\square + 30 + 1 = 731$$

$$449 = 400 + \square + 40$$

Activities for exploring ideas at greater depth

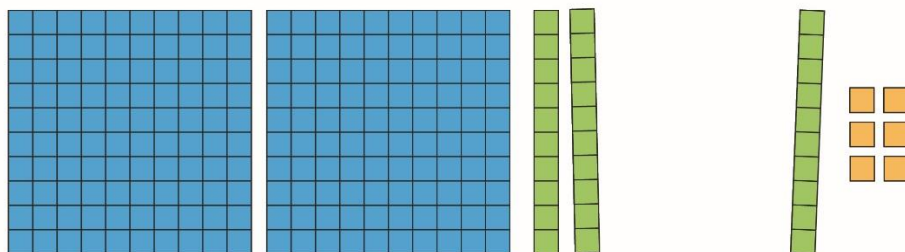
Pupils design own place value system thinking of symbols that represent each of the digits to 9 and a place value holder.

BUFFER ZONE

Step four

Regrouping 3-digit numbers flexibly

Using part whole models, regroup 3-digit numbers flexibly and in multiple ways understanding that 2 hundreds are equivalent to 20 tens etc.



236 can be regrouped into 220 and 16.

There are 23 tens and 6 ones in 236.

$$200 + 20 + 16 = 236$$

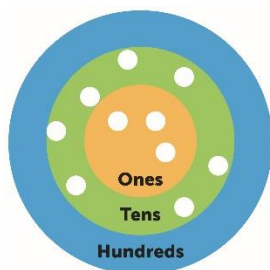
2 hundreds, 2 tens and 16 ones

Practise with a variety of 3-digit numbers using resources, pictorial representations, language and symbols.

Using [handout_3LS1_step4_regrouping_mat](#), challenge pupils to find a way of regrouping the number that no one else has thought of.

Use a hundreds, tens and ones *target board* and up to 20 counters.

- If a counter lands in the 'ones ring' its value is 1 and if it lands in the 'tens ring' it is 10 etc.
- 'Throw' the objects onto the board and work out the total.
- Pupils will need to regroup if there are more than ten objects in the 'ones ring' or 'tens ring'.



Handout_3LS1_step4_target



Introduce Banker's Game (for between 2 and 4 players). Resources: one 0-9 dice, base-10 and a place value mat.

- The aim is to collect the biggest team number they can from the banker in five to ten minutes (teacher decides).
- One pupil is the banker and responsible for the base-10 equipment.
- The other players take it in turns to roll the dice and ask the banker for the equivalent number of ones.
- Once they have more than 10 ones, they must ask the banker to regroup 10 of them for 1 ten. Likewise, they must ask to regroup 10 tens for 1 hundred.
- After the time is up, the teacher can find out which group has the greatest number.
- Pupils to record their numbers in as many ways as possible.

Activities for exploring ideas at greater depth

Pupils to be given a number e.g. 378 and asked to record on a target board, such as the one above, where the 20 counters could have landed. How many possibilities are there?

[Handout_3LS1_step4_target_possibilities](#).

Step five

Securing equality (for example 3 hundreds are equal to 30 tens and 300 ones)

Ask pupils to prove their answers using base-10 equipment or bead strings to questions such as:

When I think about the number 290 I know that it can be expressed as 290 ones or 29 tens.

Do you agree with this statement?

How else would you record this number in words?

Provide pupils with a set of digit cards (0-9). Ask them to pick 3 or 4 cards and make as many 3-digit number as possible.



Using handout_3LS1_step5_trickynumbersort, pupils to sort numbers according to place value using:

3LS1

Step 5 Tricky Number Sort

Tricky Number Sort

Using three or four of your 0-9 digit cards make as many 3-digit numbers as you can. Now look at the grid. Can you write each number into the cells so that it meets the rules? Make sure you look at both sets of rules! Some numbers might appear in more than one cell. Can you explain why might that be?

With these cards, we can make six 3 digit numbers – 246, 264, 426, 462, 624 and 642.

| | more than 35 tens | fewer than 35 tens | 0 in the ones place |
|---|-------------------|--------------------|---------------------|
| even tens digit | 426 462 624 642 | 246 264 | |
| the digit in hundreds place is greater than the digit in tens place | 426 624 642 | | |
| odd | | | |

How many numbers do you think you could make?

How will you know when you have found them all?

Do you have a system that helps you organise your numbers?

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True or False

354 can be made from 35 tens and 4 ones

6

I am thinking of a 3-digit number.
The sum of the digits is 15.
The tens digit is twice the ones digit.
What is my number?

BUFFER ZONE

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