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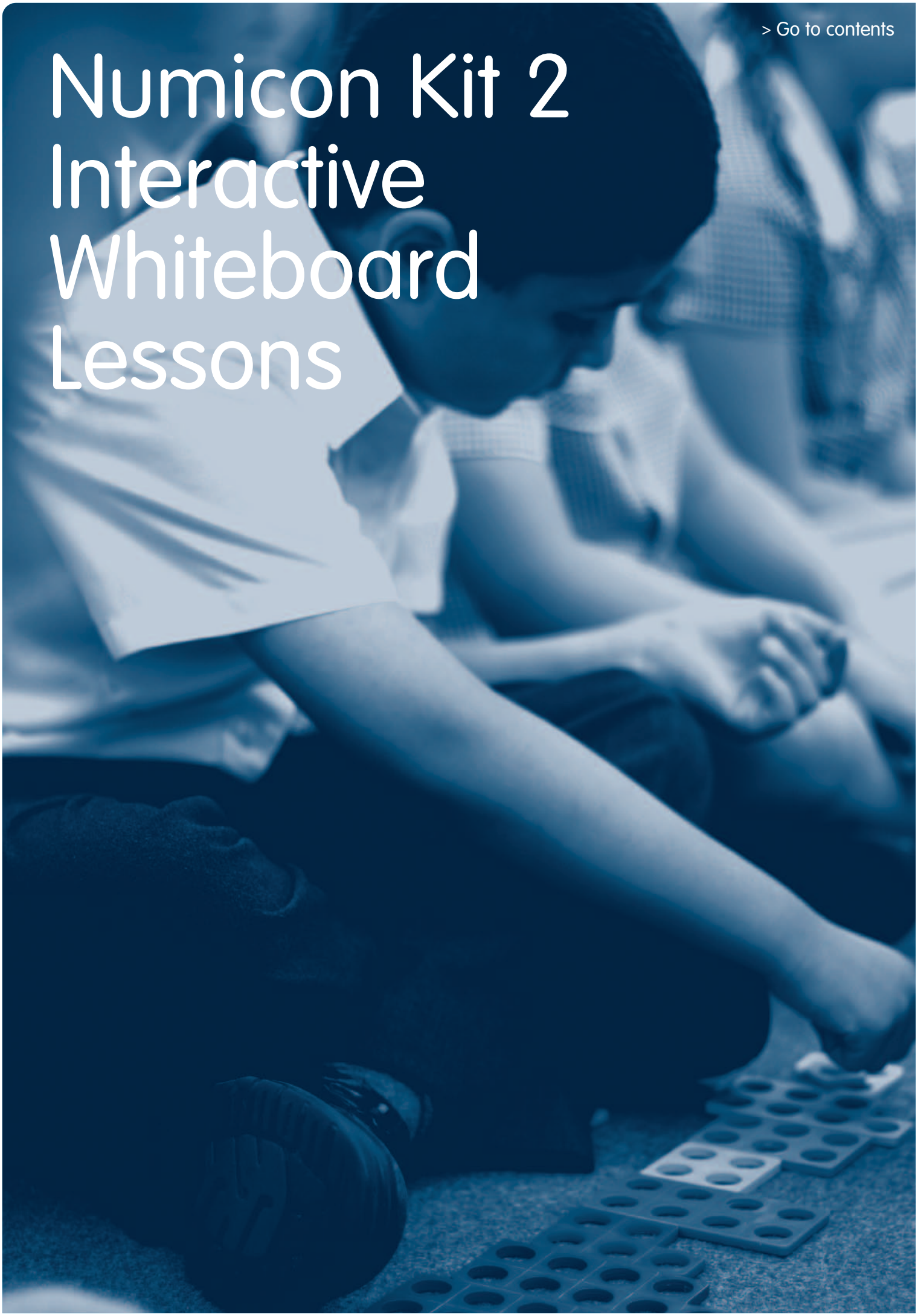
Numicon Kit 2 Interactive Whiteboard Lessons



These lessons are designed to help teachers get started with using the Numicon images and models for maths interactive software. Numicon visual imagery is structured to represent number and number relationships. The lessons show how to use the images to give children a picture of arithmetic operations and mental arithmetic strategies.

The lessons address aspects of the English National Curriculum Programme of Study for Mathematics in Key Stage 1. This is the third in three sets of ten lessons, Numicon Foundation, Numicon Kit 1 and Numicon Kit 2. The lessons are not designed as a complete teaching programme although there is progression in each set.

Each lesson uses Numicon images or number rods with other models to put across the main teaching points and to demonstrate practical activities. Pupils can then follow up the whiteboard lesson in practical work to maintain a multi-sensory approach.

How to use this document

This pdf is interactive and allows users to navigate through the document without scrolling. Use the links at the top of each page to move on to the next lesson, go back to the previous lesson and come back to this page. You can also go straight any lesson by using the links in the list below.

Aim: To understand the structure and value of numbers when 10 is added or subtracted; to understand the patterns of numbers on the 100 square

Lesson

Main screen with Numicon shapes

Select

Menu: Number lines: 100 square

Activity

- ➔ Using the blank 100 square, ask children to count in 10s clicking each decade as they count, see figure 1
- ➔ Leaving the 100 square filled with numerals, choose a Numicon shape and move it to far right of screen. Highlight the corresponding number on the 100 square, see figure 2
- ➔ Then add 10-shapes and highlight the new number, see figure 3
- ➔ Continue to add 10 in this way until the pattern is completed to the 90s.

Lesson extension

Menu: Number lines: 100 square

Activity

- ➔ Reverse the pattern by subtracting 10s, removing one 10-shape at a time and clearing the highlighted number.

Mathematical language

Tens, units, more, less, smaller, larger, before, after, counting in tens, counting back in tens, add, subtract

Reference

For further ideas refer to Numicon Kit 2, Using Pattern 1B.

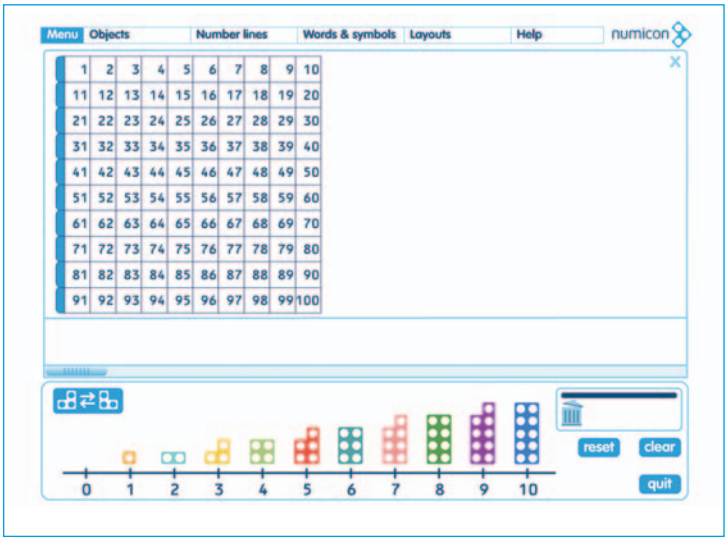


Figure 1

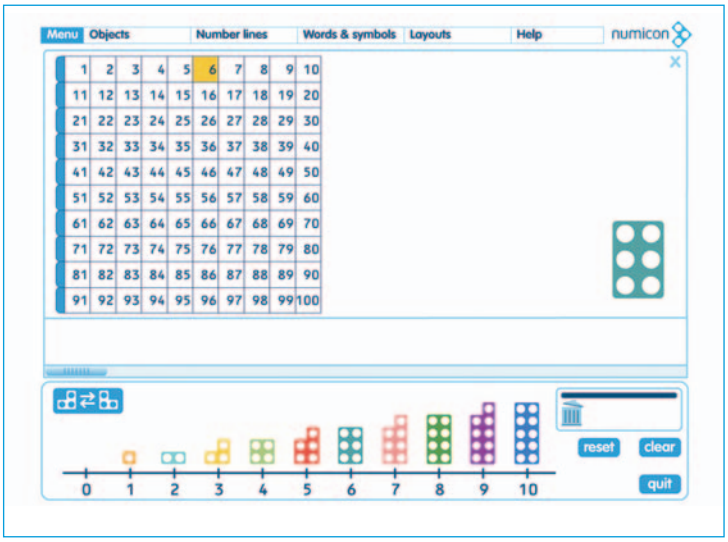


Figure 2

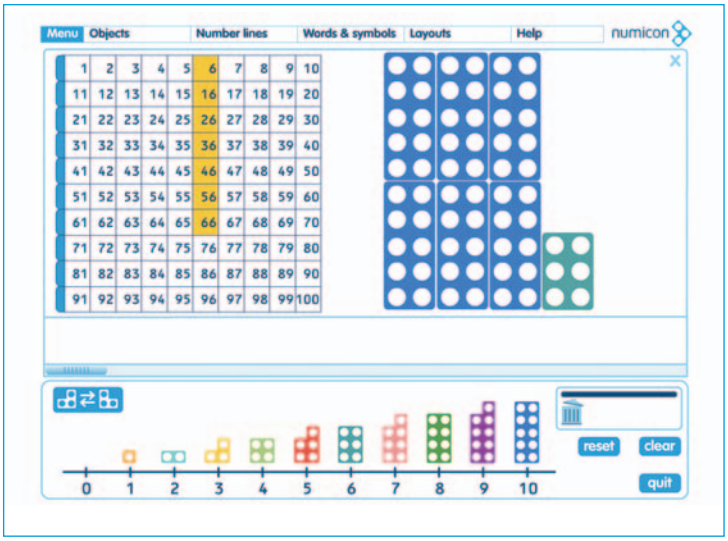


Figure 3

Aims: To understand the structure of doubles

Lesson

Main screen with Numicon shapes

Activity

- ➔ Select one of each shape in order, see figure 1
- ➔ Select one of each shape 1-10 again (these cannot be seen as they are top of the first set of shapes!)
- ➔ Click and drag on each shape in turn (rotating the odd shapes) to make the double pattern (make sure double 1 is side by side so that it looks like the 2-shape), see figure 2
- ➔ As each shape is doubled ask children to say the double fact e.g. 'double 2 is 4'
- ➔ For the doubled numbers greater than 10, use an extra 10-shape to so children can clearly see the total as a teen number, see figure 3

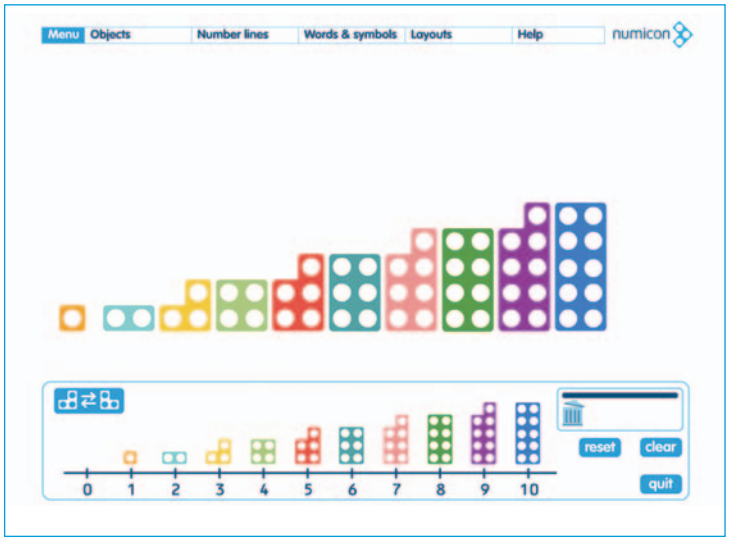


Figure 1

Figure 2

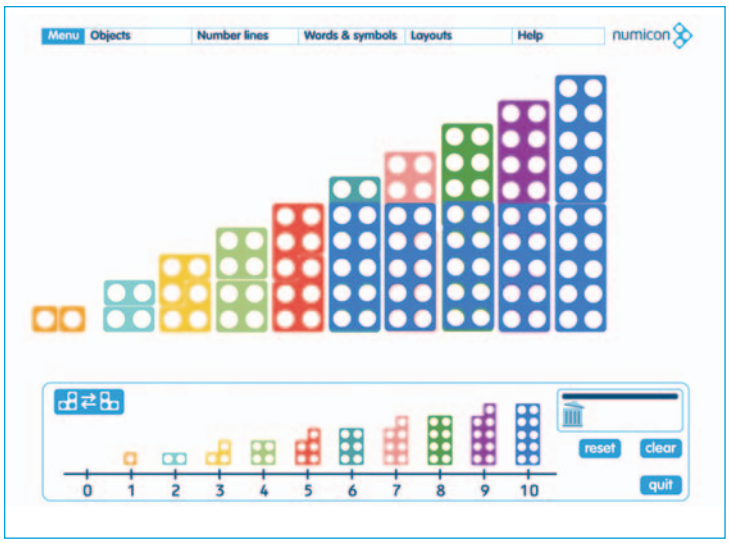


Figure 3

Lesson extension

Main screen with Numicon shapes

Activity

- ➔ Relate doubles to counting forwards and backwards in 2s
- ➔ Double higher numbers using the Numicon shapes so children can see that both the Ten and Unit numbers must be doubled.

Mathematical language

Double, add

Reference

For further ideas refer to Numicon Kit 2, Calculating 3A.

Aim: To know what each digit in a two-digit number represents including 0 as a place holder

Lesson

Main screen with Numicon shapes

Select

Menu: Layouts: TU Frame
Objects: Spinners: Numerals 1-5, 6-10

Activity

- ➔ Choose any two digit number make it with Numicon shapes and ask children, 'How many tens can you see?' 'How many units can you see?' 'What number have we made?' Put the numerals in position, see figure 1
- ➔ Remove the unit shape and numeral and ask 'what number have we made now?'
- ➔ Explain that zero is used as a place holder when there are no units
- ➔ Put the zero in position and read the number aloud, asking children how many tens it has, see figure 2
- ➔ Now use the spinner to change the number by adding units, children will see that the tens number changes when adding 10.

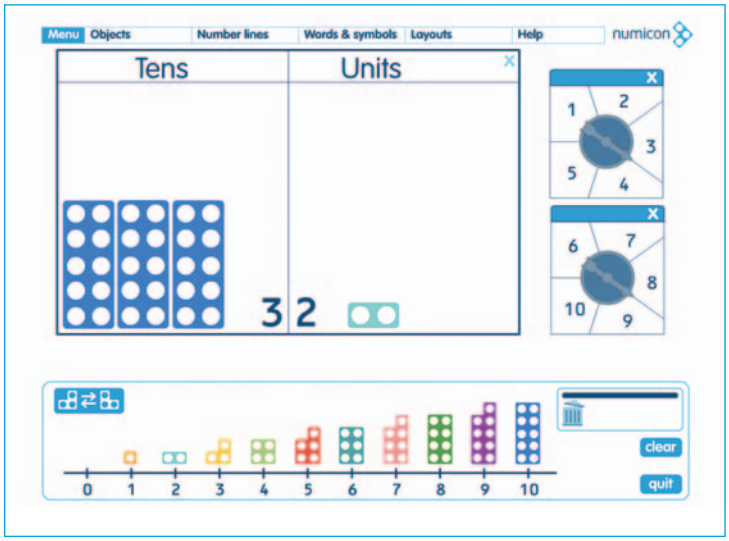


Figure 1

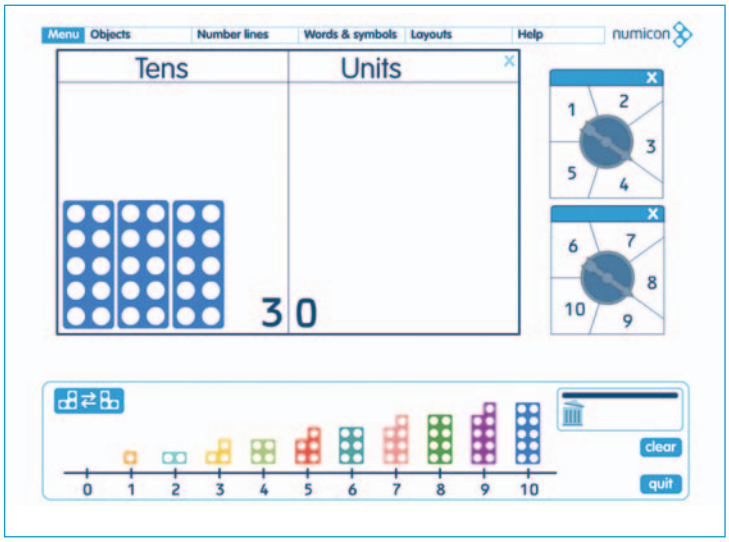


Figure 2

Lesson extension

Main screen with Numicon shapes

Select

Menu: Layouts: HTU Frame
Objects: Number rods

Activity

- ➔ Work with Hundreds, Tens and Units using rods in the HTU Frame, see figure 3.

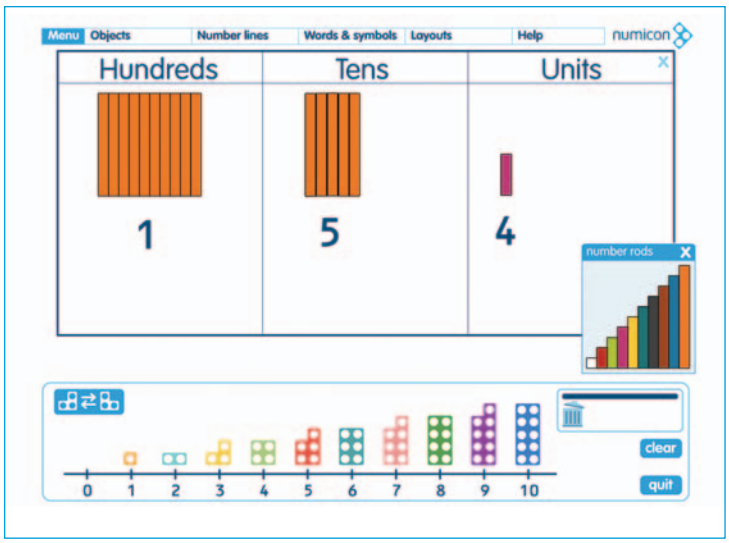


Figure 3

Mathematical language

Tens, units, place, place holder, more, less, zero, hundreds

Reference

For further ideas refer to Numicon Kit 2, Numbers and the Number System 2A.

Aim: To partition two-digit numbers into a multiple of 10s and 1s

Lesson

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals
Menu: Words & symbols: Signs

Activity

- ➔ Teacher makes a number greater than 20 with Numicon shapes (without telling children what the number is)
- ➔ Ask children which numeral goes with each Numicon shape. As they answer click on the numerals from the number line and drag into position, see figure 1
- ➔ Say 'we are going to put the shapes together to see the whole number we have made', see figure 2
- ➔ Move the shapes together and ask children what number has been made
- ➔ Now show how the number can be partitioned into Tens and Units by separating the 7 and showing the number sentence, see figure 3.

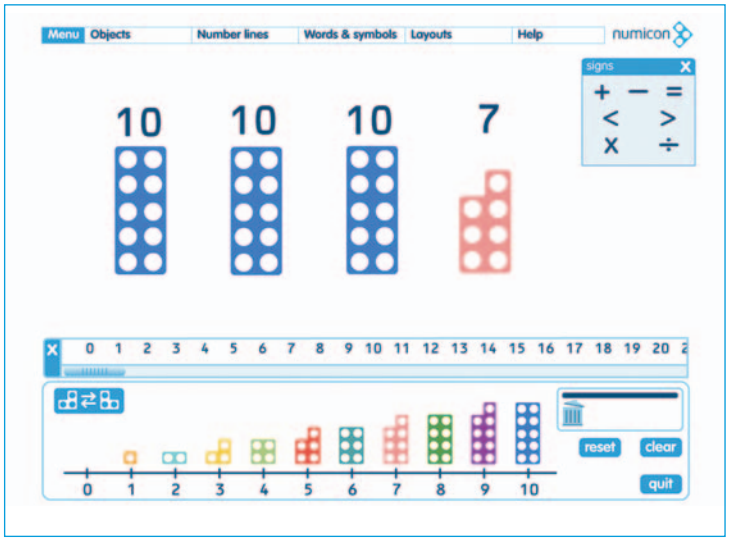


Figure 1

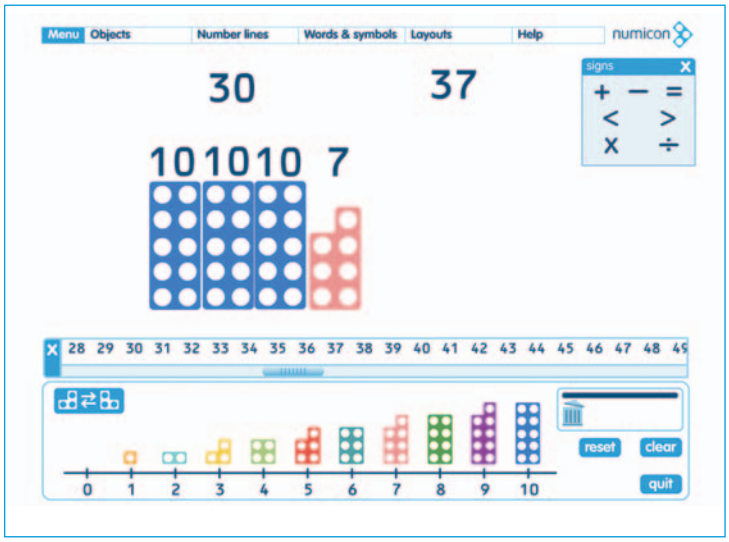


Figure 2

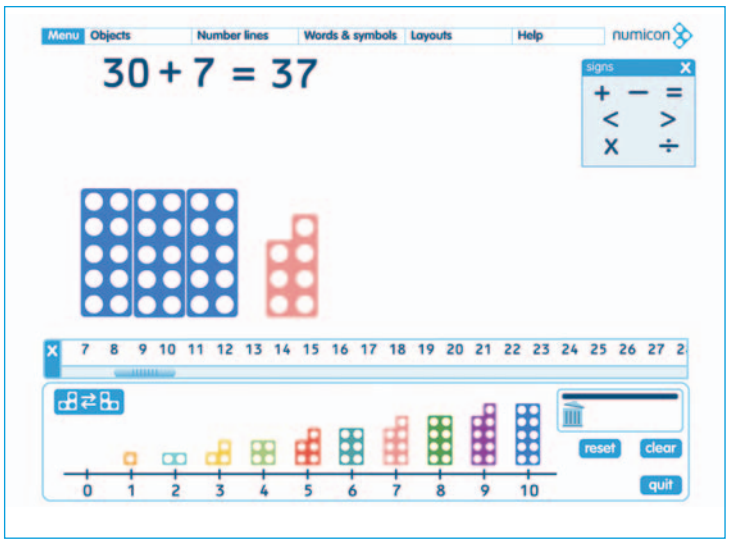


Figure 3

Lesson extension

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals
Menu: Words & symbols: Signs

Activity

- ➔ Repeat many times until children know that two-digit numbers can be partitioned into Tens and Units.

Mathematical language

Partition, tens, units, add, equals, arrange

Reference

For further ideas refer to Numicon Kit 2, Numbers and the Number System 4B and 5A.

Aim: To understand empty box notation

Lesson

Main screen with Numicon shapes

Select

Menu: Objects: Balance
Menu: Words & Symbols: signs

Activity

- ➔ Choose two shapes totalling less than 10 and put them both in the left hand pan
- ➔ Choose another shape and put it in the right hand pan, see figure 1
- ➔ Show the equation leaving a gap for the unknown number, see figure 2
- ➔ Ask children which shape is needed to balance the scales
- ➔ Add the shape and complete the equation, see figure 3
- ➔ Repeat several times with different combinations.

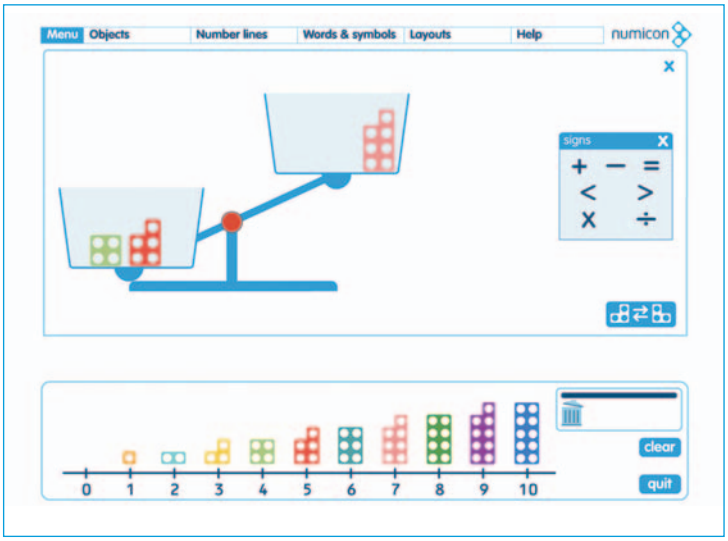


Figure 1

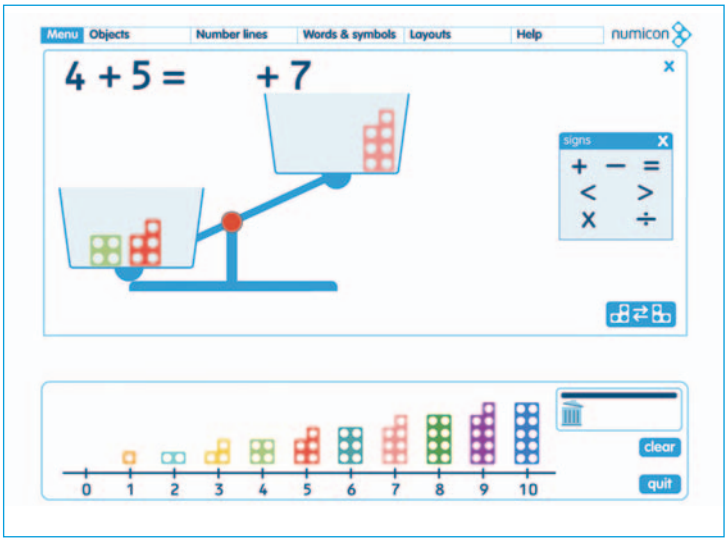


Figure 2

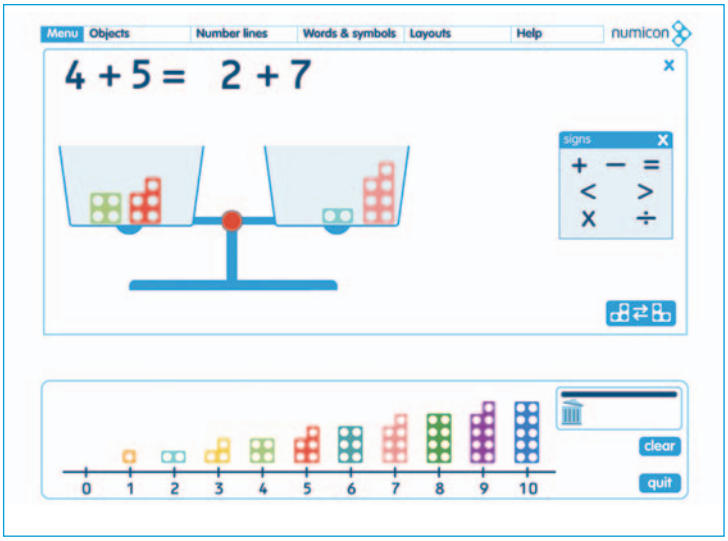


Figure 3

Lesson extension

Main screen with Numicon shapes

Select

Menu: Objects: Balance
Menu: Words & Symbols: signs

Activity

- ➔ Vary by changing the place of the missing number
- ➔ Work with higher numbers.

Mathematical language

Balances, the same amount, equal to, equals, missing number, unknown, position

Reference

For further ideas refer to Numicon Kit 2, Using Pattern 2A and 2B.

Aim: To add a single-digit number to a two-digit number bridging across a multiple of 10

Lesson

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals, Numicon tens
Menu: Words & symbols: signs

Activity

- ➔ Choose a teen number and a single digit number
- ➔ Write the addition sum and show the corresponding Numicon shapes, see figure 1
- ➔ Lay the shapes along the Numicon tens number line
- ➔ Ask children how they would partition to bridge the multiple of ten, show with the Numicon shapes, see figure 2
- ➔ Show the answer with shapes laid above the number line, and complete the sum, see figure 3

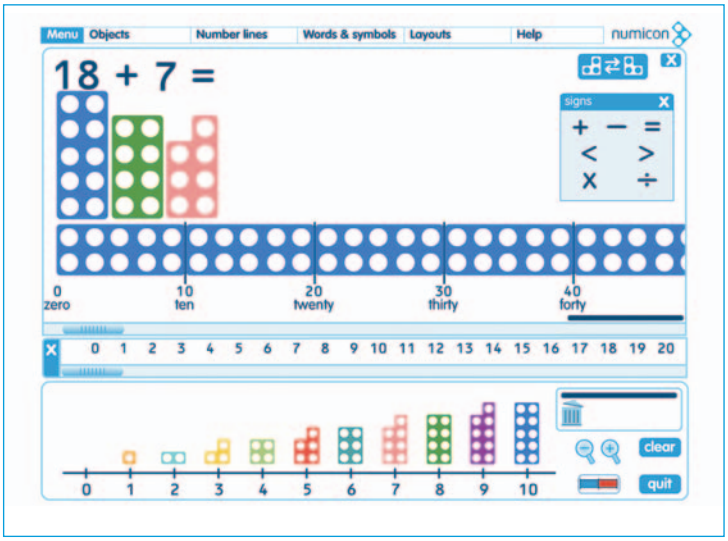


Figure 1

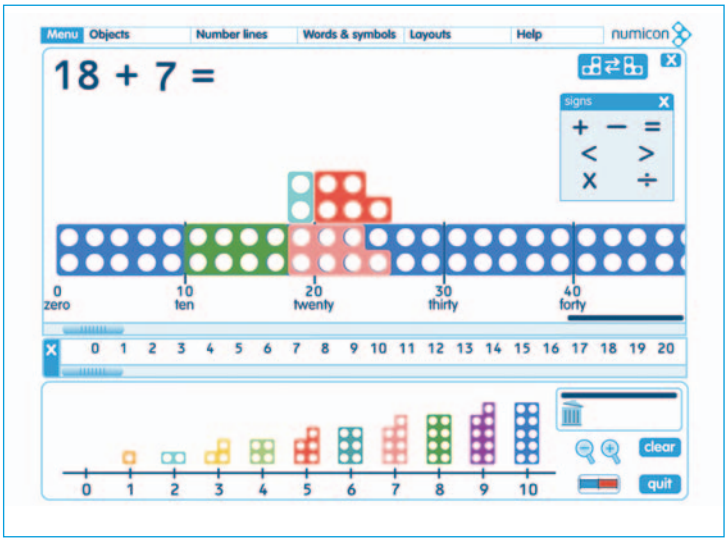


Figure 2

Lesson extension

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals, Numicon tens
Menu: Words & symbols: signs

Activity

- ➔ Repeat often until children can work symbolically without the shapes.

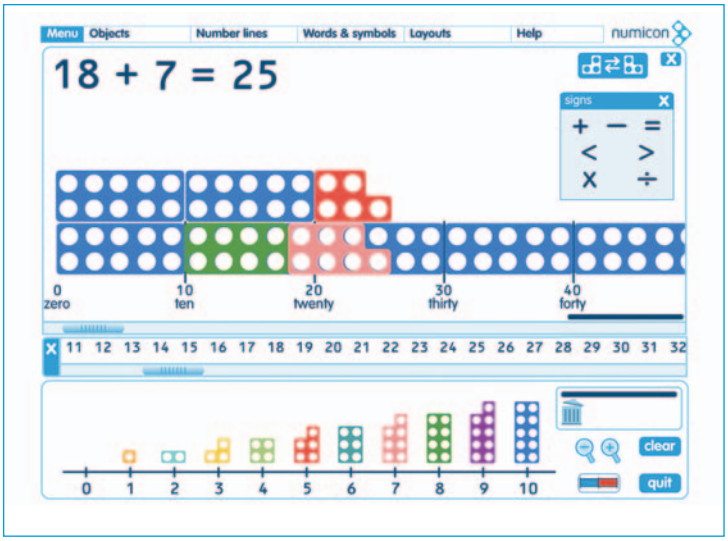


Figure 3

Mathematical language

How many more, multiple of ten, left over, add, equals, partition

Reference

For further ideas refer to Numicon Kit 2, Calculating 5A.

Aims: To compare and find the difference between two close numbers

Lesson

Main screen with Numicon shapes

Select

Menu: Objects: Number rods
Menu: Words & symbols: Words, signs
Menu: Number lines: Numerals, Rod number track

Activity

- ➔ Explain that we are going to find the difference between two close numbers and from the word menu select 'the difference between, and and is '. Clear the word menu
- ➔ Choose two numbers with a small difference from two adjacent decades
- ➔ Make the numbers with rods laying rods for the larger number in the Rod number track and those for the the smaller number above it, see figure 1
- ➔ Ask children to find the difference by completing to the next multiple of ten and adding on the remaining part, see figure 2
- ➔ Ask children what is the total difference and write the subtraction. Repeat with different examples, see figure 3.

Lesson extension

Main screen with Numicon shapes

Activity

- ➔ Once children are confident this can be extended to work out change problems using money.

Mathematical language

Difference between, more, less, multiple of ten, decade, compare

Reference

For further ideas refer to Numicon Kit 2. Calculating 6A and 6B.

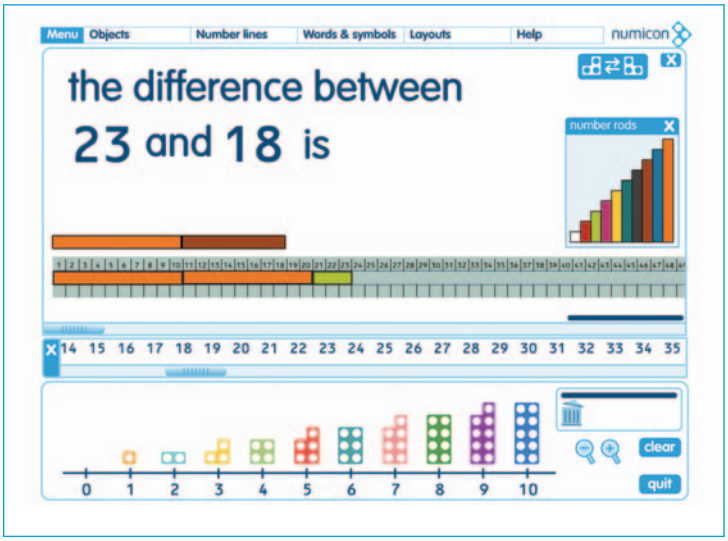


Figure 1

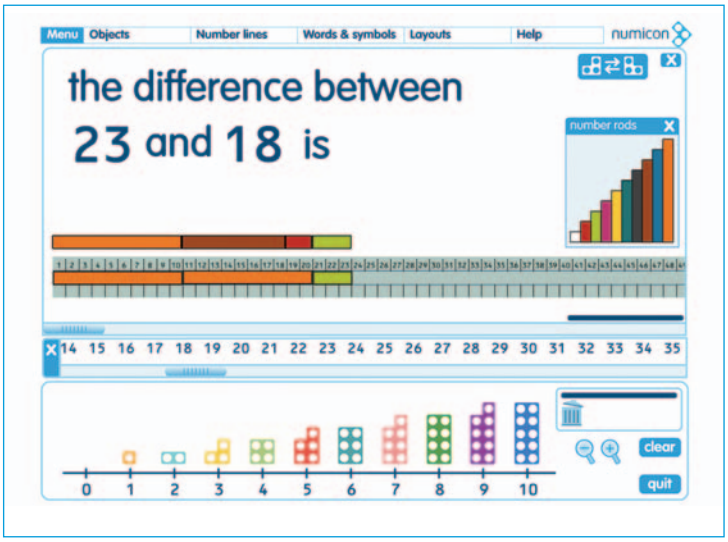


Figure 2

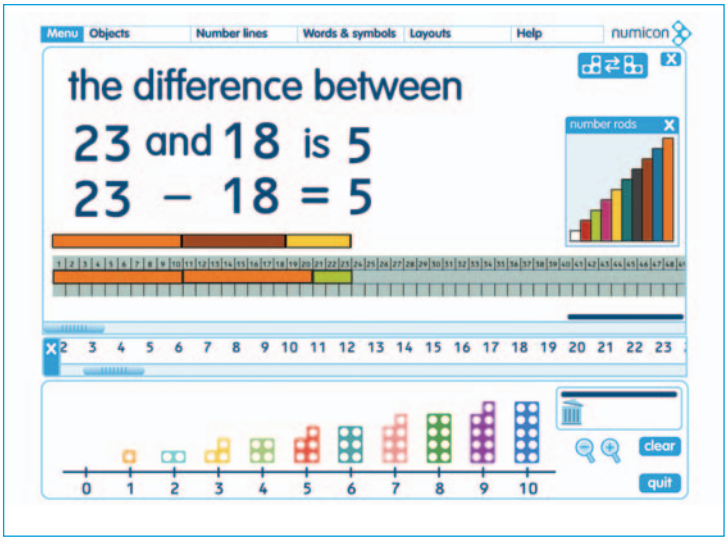


Figure 3

Aim: To understand the commutative property of multiplication

Lesson

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals, Numicon tens
Menu: Words & Symbols: signs

Activity

- ➔ Choose a multiple of 5, lay the corresponding number of 5-shapes along the Numicon tens number line and write the multiplication, see figure 1
- ➔ Ask children 'What is the commutative multiplication fact?'
- ➔ Write the commutative fact and lay the corresponding shapes above the number line, see figure 2.

Lesson extension

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals, Numicon tens
Menu: Words & Symbols: signs

Activity

- ➔ Explore the commutative facts of different multiplication tables.

Mathematical language

Times, multiply by, array, the same as, product, commutative fact

Reference

For further ideas refer to Numicon Kit 2, Calculating 9A.

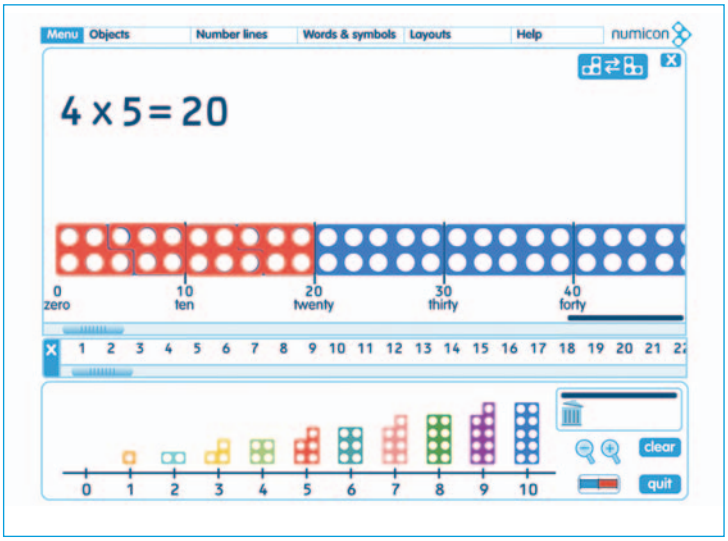


Figure 1

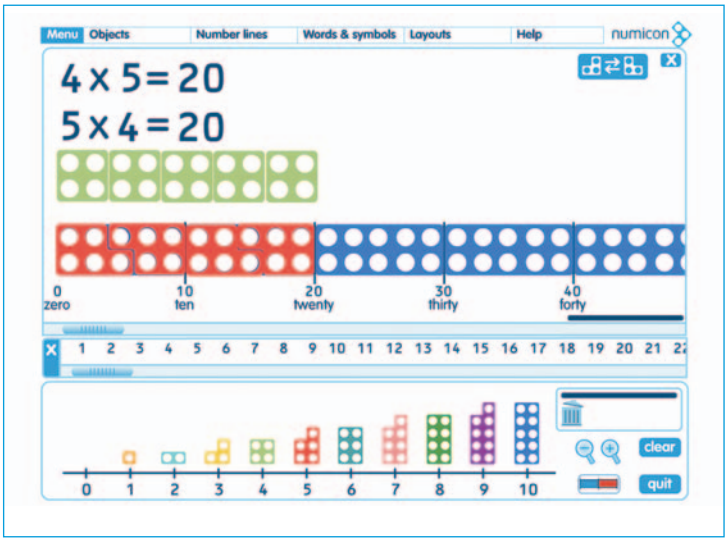


Figure 2

Aim: To use knowledge of multiplication tables to do division

Lesson

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals, Numicon tens
Menu: Words & symbols: signs

Activity

➔ Choose a number from a multiplication table within the children's knowledge and ask them division questions, giving a picture of the question by laying shapes along the Numicon tens number line, see figure 1

➔ Repeat with many examples.

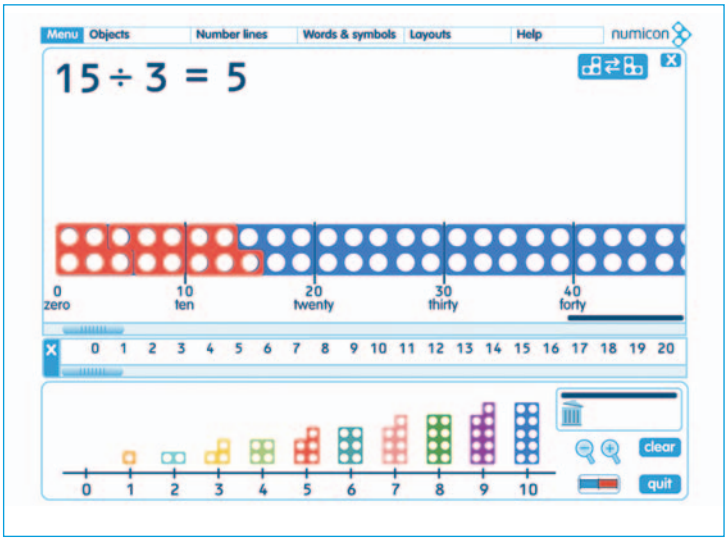


Figure 1

Lesson extension

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals, Numicon tens
Menu: Words & symbols: signs

Activity

➔ Ask children to find the inverse multiplication fact, see figure 2.

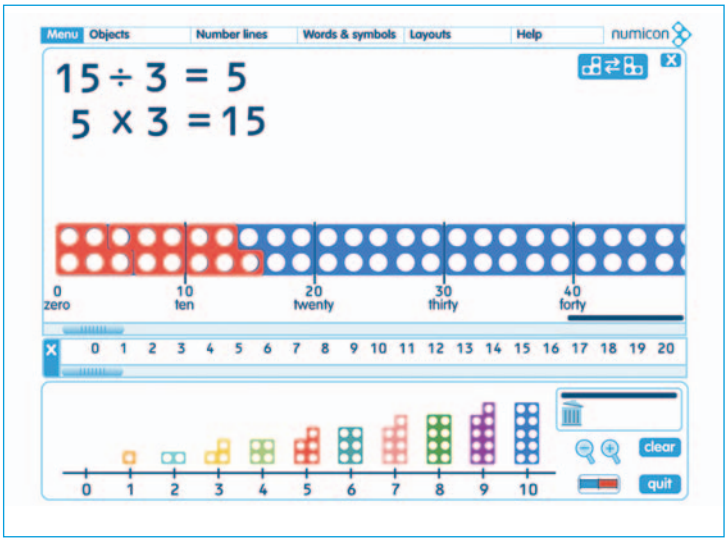


Figure 2

Mathematical language

Division, divide, how many are in, multiplication fact, inverse, connection, partner

Reference

For further ideas refer to Numicon Kit 2, Calculating 10B.

Aim: To find half of multiples of 10 and half of other numbers

Lesson

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals
Menu: Words & symbols: fractions

Activity

- ➔ Choose an odd multiple of 10 and make it with Numicon shapes
- ➔ Explain that we are going to find 'half of' and the number at the top of the screen, see figure 1
- ➔ Share the shapes into two sets leaving one 10-shape in the middle
- ➔ Ask children 'How can we share the 10?'
- ➔ Place two five shapes on top of the 10-shape and discard the original 10-shape. Substitute the fraction for the word half, see figure 3
- ➔ Share the fives, see figure 3
- ➔ Repeat with other examples.

Lesson extension

Main screen with Numicon shapes

Select

Menu: Number lines: Numerals
Menu: Words & symbols: fractions

Activity

- ➔ Find half of other numbers.

Mathematical language

Half, the same amount, equals, tens, units

Reference

For further ideas refer to Numicon Kit 2, Calculating 12A.

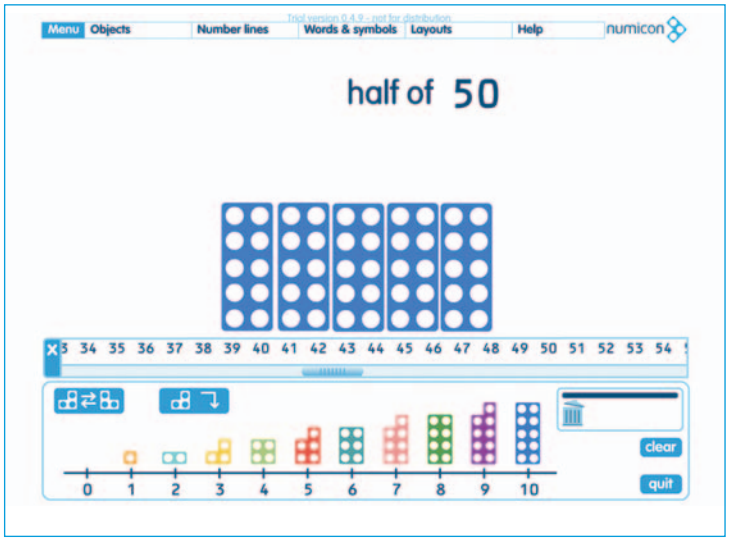


Figure 1

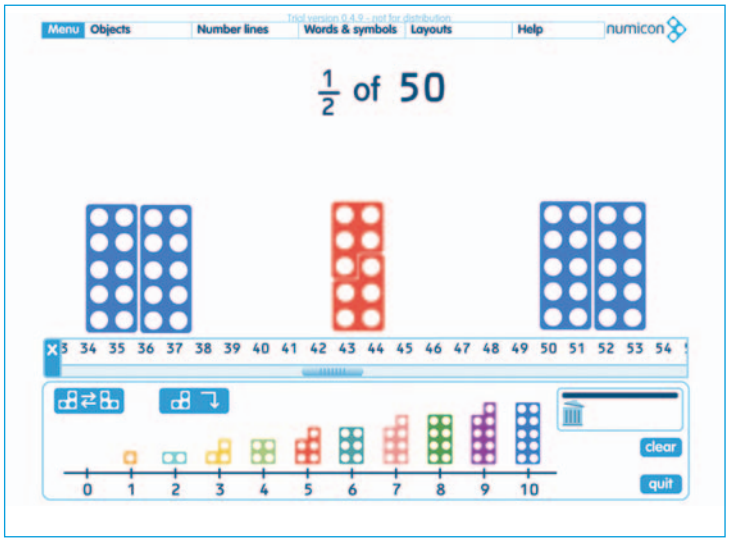


Figure 2

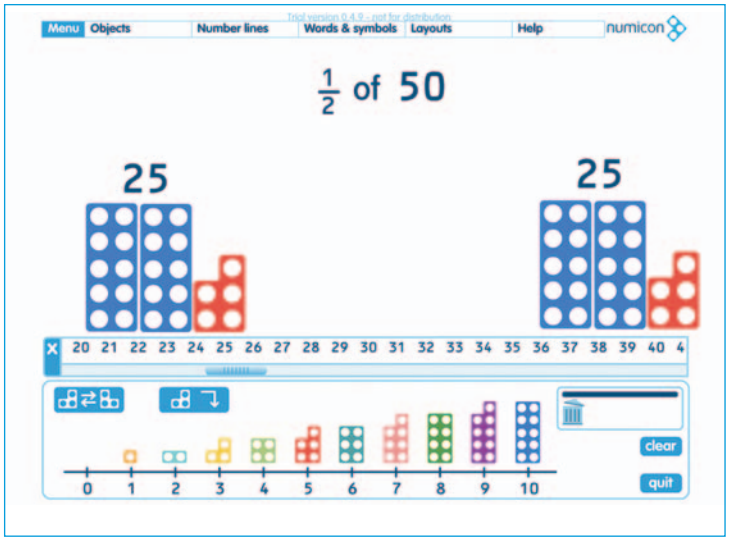


Figure 3