

ACTIVITY 1.3 CONNECTIONS (ADD, SUBTRACT)

3-4	4-5	5-6	6-7
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Objective

To develop the concepts of addition and subtraction by making connections between symbols, concrete experiences, language and pictures.

Materials

A box of counters (or toys, or pennies); paper and pencil; strips of card with words associated with addition and subtraction written on them (such as: take away, add, leaves, make); cards with numbers from 1 to 20 written on them; cards with +, -, = symbols on them; a duplicated sheet of number lines marked from 0 to 20.

Method

Develop an activity, for a small group of children, using subtraction, similar to that using division outlined in this chapter (see Figure 1.3). Do not provide everything outlined here at the start, but gradually introduce a wider range of experiences to be connected with subtraction. The children can be provided with a prompt sheet with these words written on it: *counters, sentences, picture, numbers, number line*. The children should start with two of the numbered cards, such as 12 and 5. It is explained to them that this means they put out

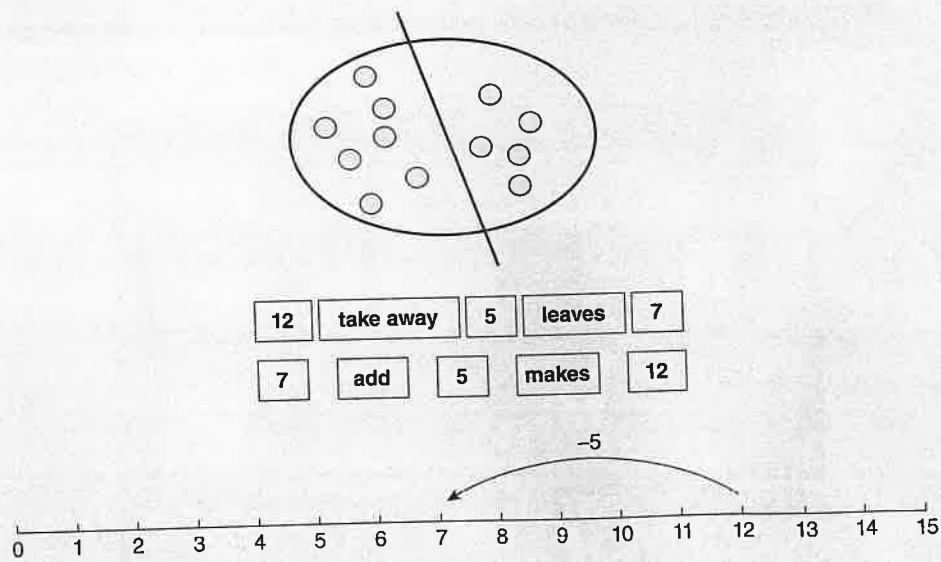


Figure 1.9 Making subtraction connections

ACTIVITY 3.2 CONNECTIONS (PLACE VALUE)

3-4	4-5	5-6	6-7
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Objective

To develop understanding of place value by making connections between symbols, concrete experiences, language and pictures.

Materials

A pack of cards with the numerals 0 to 9 written on them, and strips of card with the words: *one, two, three, ... nine, and twenty, thirty, forty, ... ninety*; base-ten materials (tens and ones); 10p and 1p coins; a number line marked from 0 to 99 (such as a metre rule marked in centimetres); a movable pointer for indicating numbers on the number line; arrow cards for tens and units.

Method

This is a co-operative activity for a small group of children. They turn over two of the numeral cards, for example 2 and 3. They then arrange them side-by-side to make a two-digit numeral, for example 23. They then have to make all the possible representations of this with the materials provided, as illustrated in Figure 3.12. (Because the 'teens' do not fit the same language pattern as the subsequent numbers, they should be excluded from this game – teachers should therefore arrange the cards so that one is not used in the tens position for this activity.)

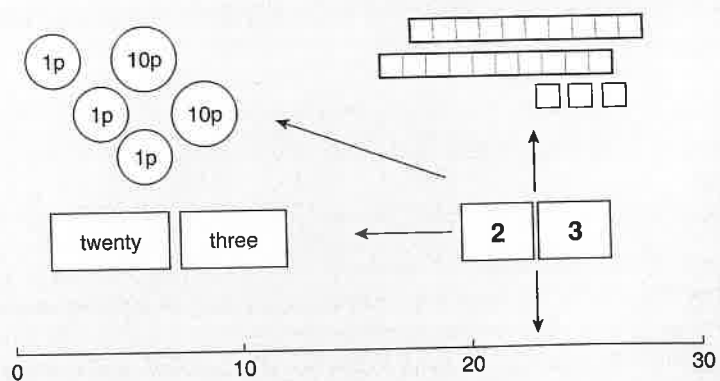


Figure 3.12 Making place-value connections

ACTIVITY 3.3 HUNDRED-SQUARE PUZZLE

3-4	4-5	5-6	6-7

Objective

To provide an opportunity for children to apply and reinforce their understanding of place-value in numbers up to 100.

Materials

A hundred square prepared on card with a proportion of numbers missing; cut this up into four pieces (see the example in Figure 3.13).

Method

Each of four children is given one of the pieces with the challenge to fill in the missing numbers. The four children then fit together pieces of the number square to check whether they are all correct. Encourage discussion between the children about how they know what the missing numbers should be and how they check the completed square.

	6	7		9	
15		17	18		20
25	26		28	29	30
35		37			40

1		3	
11	12		14
21	22	23	
31	32	33	34
			44
51			54

46	47	48		
56	57			60
66		68	69	70
			79	80
		88		90
		99		

61	62		64	65		
		73	74	75		
81	82	83	84			87
		93		95		

Figure 3.13 Example of a hundred-square puzzle

ACTIVITY 4.1 TEDDIES ON THE BUS

Objective

To help young children make the transition from 'counting all' to 'counting on'.

Materials

A supply of teddies and a toy bus or some other vehicle in which the teddies can be placed.

Method

Put, say, 5 teddies on the bus, engaging the children in counting them as you do this. Say, for example, 'These 5 teddies are going to the seaside.' Then get one of the children to drive the bus away out of sight. Ask the children how many teddies have gone to the seaside on the bus.

Then tell them that soon the bus is going to come back with the 5 teddies on it and then 3 other teddies are going to get on it as well and they are all going to the shopping mall. How many teddies will be going on the bus to the shopping mall? The children are now in a position where they cannot physically count all the teddies, because 5 of them are out of sight, and can be encouraged to count on from 5. Get the children to join in: (a) 'On the bus there are one, two, three, four, *five* teddies. When these get on there will be ... (pointing to them in turn) six, seven, *eight*.' Then: (b) 'So on the bus there are *five* teddies, and these three will make ... (again pointing) six, seven, *eight*.' Then the bus is brought back and the three teddies are put on the bus, with the children again counting six, seven, eight. The bus is driven off to the shopping mall.

Repeat the story with different small numbers. Eventually drop stage (a).

ACTIVITY 4.6 SWAPS (ADD, SUBTRACT)

3-4	4-5	5-6	6-7
			□

Objective

To develop connections between language, symbols, concrete experience and pictures, for the concepts of addition and subtraction.

Materials

Coins, such as 1p and 10p; base-ten materials (ten-rods and units); number lines; blank paper; a collection of simple stories for addition and subtraction; cards with the following words written on them: *story, number line, picture, symbols, coins, blocks*.

Method

A small group of children is given a starting point and a selection of cards indicating a sequence of swaps to be achieved. When they have completed all their swaps, they report to the teacher on what they have done.

Figure 4.12 shows an example with a story given as the starting point, and a challenge to swap this for coins, then for a number line drawing, and finally for symbols. The children might respond to this challenge by putting out 8p and a further 4p to make the 12p required; then drawing an arrow on a number line from 8 to 12; and finally writing on their piece of paper the symbols $8 + 4 = 12$ or $12 - 8 = 4$. The starting point may be a story, a number-line diagram, a sum written in symbols or a picture, with the sequence of swaps varied appropriately.

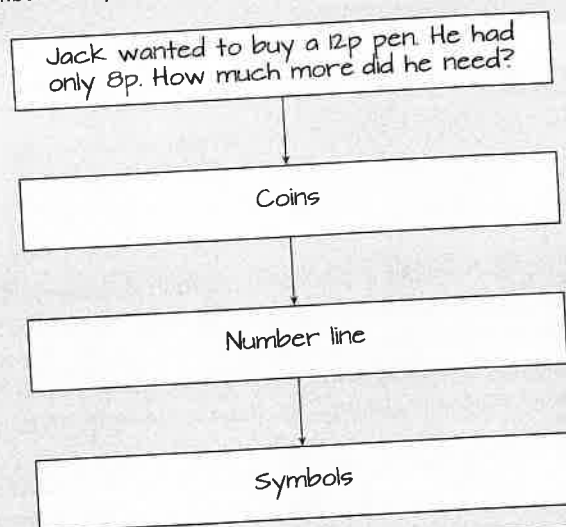


Figure 4.12 Swaps

ACTIVITY 5.3 RODS ON THE LINE

3-4	4-5	5-6	6-7
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Objective

For the children to make connections between different images of multiplication, division and the associated language.

Materials

For each small group of children, a number line marked in centimetre steps from zero to 30 and some coloured centimetre-based number rods, representing 2s, 3s, 4s and 5s.

Method

The children are given a number such as 18. The teacher shows them how they can get from zero to 18 using just 3-rods, as shown in Figure 5.13. How many 3-rods get you to 18? Then, through appropriate questioning, encourage the children to connect this image with the 3-times

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table, using the 'joins' between the rods to help them count along the line in steps of 3. Connect the arrangement of rods on the line with multiplying 3 by 6 to get 18, with dividing 18 by 6 to get 3. If children are beginning to record multiplications and divisions in symbols, they might write down $6 \times 3 = 18$ and $18 \div 6 = 3$. Then ask them to see if they can make the 18 using another sort of rod. Can they make it just from 4s? Just from 5s? Just from 2s? Follow the result with 2-rods with the same kind of questioning, statements and recording as for the 3-rods. Then repeat with other numbers on the number line, such as 12 or 20.



Figure 5.13 How many 3-rods to get to 18 on the number line?