

ACTIVITY 4.1 TEDDIES ON THE BUS

3-4	4-5	5-6	6-7
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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 4.2 STAIRCASE AND ZERO-MAT

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

To provide experience of addition and subtraction by counting up and counting down.

Materials

A bag of wooden cuboid blocks and a blank strip of card the same size as one of the oblong faces of the blocks. The blocks are used to construct a staircase with four or more steps, as shown in the photograph; the piece of card represents a mat at the bottom of the stairs. The mat will be called the 'zero-mat'. One or more toy people/animals are to stand on the mat and then to climb up and down the stairs – or any other suitable items you wish to use to liven up the activity.

Method

This activity can be done with one child or a small group. Start by allowing the children to build the staircase and put the mat in place. To begin with, get the children to count up and down as the toy person climbs from the zero-mat to the top of the stairs and back down again: zero, one, two, three, four ... four, three, two, one, zero. The activity works particularly well if it is incorporated into a story. Thus, for example, in the photograph, Mr Black – Arthur's toy builder – is having a rest on step 2 as he makes his way up to step 4, which requires some repair work. How many more steps does he have to climb? As the toy climbs up, the child counts on from step 2: two ... three, four. When he arrives at step 4 he realizes that he needs some more nails, which he left on the zero-mat. How many steps does he have to go down to collect them? As the toy climbs down the staircase the child counts down from step 4: four ... three, two, one, zero!



ACTIVITY 4.3 COMPARATIVE LANGUAGE

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

To lay the foundation for later experience of the comparison structure of subtraction by developing the language of comparison (see Table 4.6).

Materials

A bag of coloured cubes and some corresponding coloured discs; some toy cars and a ramp; a jumper and some building blocks; and potentially many other things.

Method

Generate lots of situations in which the children can answer questions using some of the language in Table 4.6. Here are some examples. Each one is repeated enough times for all the children to have a turn and for the language patterns to be established.

1. The children stand in a circle. Two children are chosen to step forward and to stand back to back in the middle. Establish this pattern of questions and answers:

(Continued)

(Continued)

Teacher: *Who is shorter?*
Children: *Tom is shorter than Meg.*
Teacher: *Who is taller?*
Children: *Meg is taller than Tom.*

2. A long line is marked on the ground, with a number of coloured discs placed randomly along it. All the children assemble at one end of the line. Then two children in turn choose a coloured cube from a bag and go and stand on the corresponding disc on the line. Again, the same pattern of questions and answers is used:

Teacher: *Who is nearer?*
Children: *Tom is nearer than Meg.*
Teacher: *Who is further away?*
Children: *Meg is further away than Tom.*

3. Two children are chosen to pick a toy car and on a signal from the teacher they let them roll down a ramp. The questions and answers follow a similar pattern: *Whose car is faster? Whose car is slower?*
4. Two children are chosen to do two tasks, such as one putting on a jumper and the other stacking some wooden blocks. The questions and answers follow a similar pattern: *Which takes longer? Which takes less time?*

ACTIVITY 4.4 IN MY HOUSE AND IN YOUR HOUSE

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

To draw on data from the child's home to develop the comparison structure of subtraction.

Materials

A survey sheet for children to take home, along the lines of the example shown in Table 4.9. The teacher will be careful to avoid requests for personal data that might be regarded as being in any way sensitive.

Method

The teacher explains that the first column is what she (he) has in her (his) house. The children take the survey sheets home and, with the help of an adult, complete the 'in your house'

column for their house, and how many more or less this is than the teacher's. For example: Pairs of scissors: 8 (in the teacher's house); 5 (in the child's house); 3 less. The children's own data is then used back at school (sensitively) in a question and answer session on difference, more than, and less than. The benefits of making this a home-based activity are that children are motivated by genuine data about themselves, it makes the connection between mathematics learnt in school and their real lives, and it promotes talk with the parent/guardian that uses key mathematical language.

Table 4.9 Survey sheet for children to complete at home

	In my house	In your house	How many more or less?
People living there	5	_____	_____
Children	3	_____	_____
Pets	0	_____	_____
Telephones	3	_____	_____
Chairs	16	_____	_____
Pairs of scissors	8	_____	_____

ACTIVITY 4.5 STORIES (ADD, SUBTRACT)

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

To help children connect the symbols for addition and subtraction with a wide range of situations and language.

Method

Read the children some examples of stories for addition statements, such as $3 + 5$. For example: 'One day Henny Penny laid 3 eggs and Turkey Lurkey laid 5 eggs. How many eggs is that altogether?' Get them to make up their own stories, for examples like $4 + 8$. Use larger numbers if appropriate. Children should share and discuss their stories with one another and with the teacher. Repeat this with subtraction statements such as $9 - 3$.

To encourage the use of different structures and contexts, give specific words or phrases to be included in the story, such as: *more than*, *less than*, *increased*, *reduced*, *younger*, *older*. Alternatively, give the children the start of the story and ask them to complete it. For example, for $9 - 3$: 'Meg had 9 marbles, but Tom...' Or ask them to make up a story for $9 - 3$ about someone going shopping with 9p to spend.

ACTIVITY 4.6 SWAPS (ADD, SUBTRACT)

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

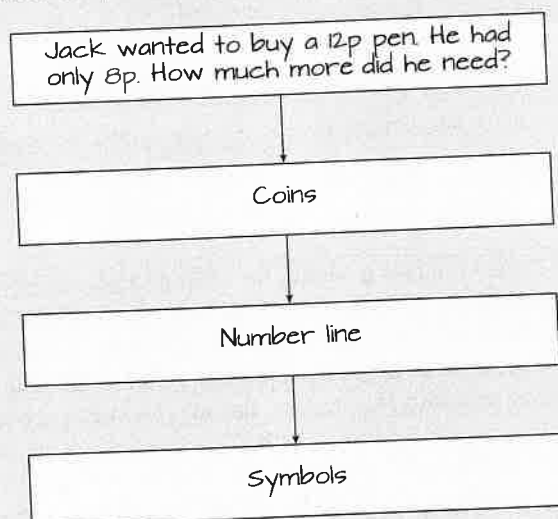


Figure 4.12 Swaps

ACTIVITY 4.7 SENTENCES (ADD, SUBTRACT)

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

To develop language patterns for addition and subtraction.

Materials

Several sets of strips of card with the following words or phrases written on them: *add*, *subtract*, *and*, *take away*, *more than*, *less than*, *the difference*, *between*, *makes*, *leaves*, *is*, *equals*; several sets of cards with appropriate numerals written on them; counting materials; a number line.

Method

A small group of children is given three numbers and challenged to use the cards to make up as many different sentences as they can using these three numbers. Figure 4.13 shows some examples of what might be achieved with the numbers 3, 4 and 7. The counting materials and number line are used to give concrete embodiment to the children's thinking about the numbers and to enable them to check their sentences.

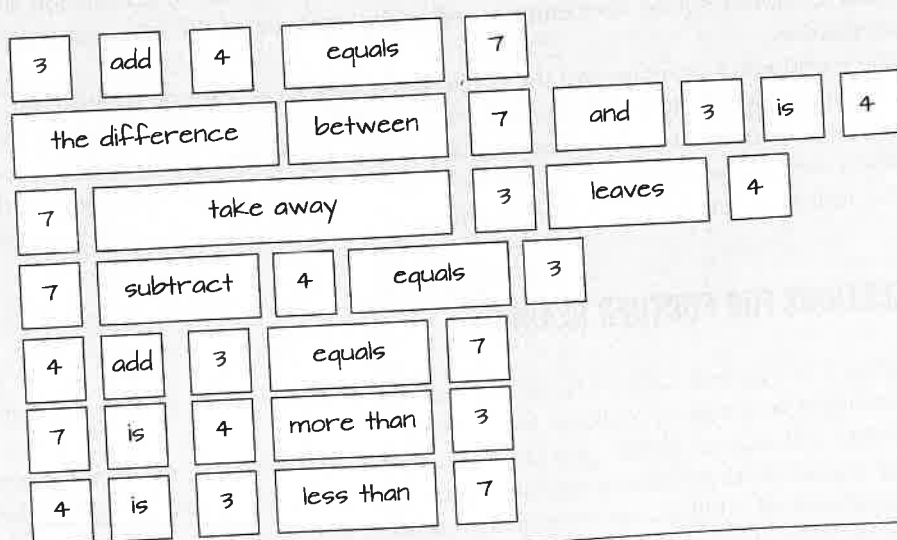


Figure 4.13 Sentences for 3, 4 and 7