

# Math Background

## Change Problems and Collection Problems

Children have been solving Change word problems and Collection word problems for much of the year. Change problems involve change over time. This change can be an increase or a decrease. Collection problems involve two quantities that are put together or taken apart physically or conceptually. Equations show Change situations well and Math Mountains show Collection situations well. However, by now, many children are flexible in their thinking and may use either equations or Math Mountains, or both, for either kind of problem.

### Change Plus: Unknown Change

9 bunnies hopped into the yard.  
Then some more bunnies came.  
Now there are 14 bunnies.  
How many came?

$$9 + \square = 14$$

```
graph TD; 14 --- 9; 14 --- square1[ ];
```

### Change Minus: Unknown Change

Julie bought 14 peaches.  
She ate some of them.  
She has 5 peaches left.  
How many did she eat?

$$14 - \square = 5$$

```
graph TD; 14 --- square2[ ]; 14 --- 5;
```

### Collection: Unknown Partner

Grandmother put 9 flowers in the blue vase and some flowers in the red vase. There are 14 flowers altogether.  
How many flowers are in the red vase?

```
graph TD; 14 --- 9; 14 --- square3[ ];
```

$$9 + \square = 14$$

### Change Plus: Unknown Result

9 bunnies hopped into the yard.  
Then 5 more bunnies came.  
How many bunnies are in the yard now?

$$9 + 5 = \square$$

```
graph TD; square4[ ] --- 9; square4 --- 5;
```

### Change Minus: Unknown Result

Julie bought 14 peaches.  
She ate 5 of them.  
How many does she have now?

$$14 - 5 = \square$$

```
graph TD; 14 --- 5; 14 --- square5[ ];
```

### Collection: Unknown Total

Grandmother put 9 flowers in the blue vase and 5 flowers in the red vase.  
How many flowers are there altogether?

```
graph TD; square6[ ] --- 9; square6 --- 5;
```

$$9 + 5 = \square$$

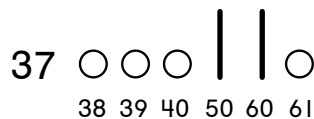
In this unit, a special kind of Collection problem called Category or Group Name problems are introduced. These problems involve categories with sub-categories such as children (boys, girls), fruit (apples, bananas), and flowers (roses, tulips). Such problems facilitate children's language learning.

## Teaching Unit 9 (Continued)

### More Complex Problems

**2-Digit Numbers** All the story problems discussed on the previous page had an unknown total or an unknown partner. In Unit 8, children solved problems with 2-digit totals. In this unit, children explore problems with 2-digit unknown partners. These problems extend children's understanding and use of place value concepts. The most common solution methods are to use 10-sticks and circles to count on by tens and ones.

$$37 + \square = 61$$



### Solution Strategies

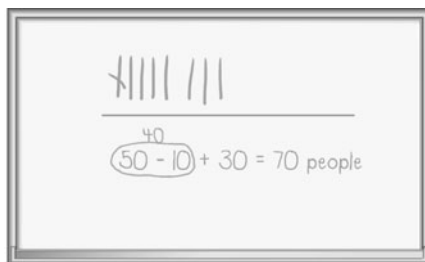
In Unit 2, children represented story problems by making simple circle drawings. Now children have mastered equation building and numeric solution methods, although various types of drawings are still acceptable.

**Important Words** Since the key to any problem is understanding what is being asked, Unit 9 continues to focus on important terms such as *altogether*, *the rest*, *some*, *in all*, and *total*. Children are sometimes asked to retell story problems to show that they understand what is being asked.

**Math Talk** A great deal of emphasis is placed on Math Talk in this unit as children solve and explain their solution strategies. Because some children will move into symbolic methods faster than others, you can expect to see a wide diversity of approaches. These variations will make the explaining sessions more interesting than they were previously.

### Multi-Step Problems

50 people were on the bus.  
10 people got off at the first stop.  
30 people got on at the next stop.  
How many people are on the bus now?



### Story Problem Festival

Children will write word problems during the whole unit. Encourage some children to write comparison problems like those discussed in Unit 6. Select and save problems of all different types for children to solve on the final day of the unit in a Story Problem Festival.

**Daily Routines** Continue the *Money Routine* and *Date and Time* throughout Unit 9. Introduce the new routine for Unit 9, *Change for a Dollar*. The description of all of the Daily Routines begins on page xxiii of the Introduction.