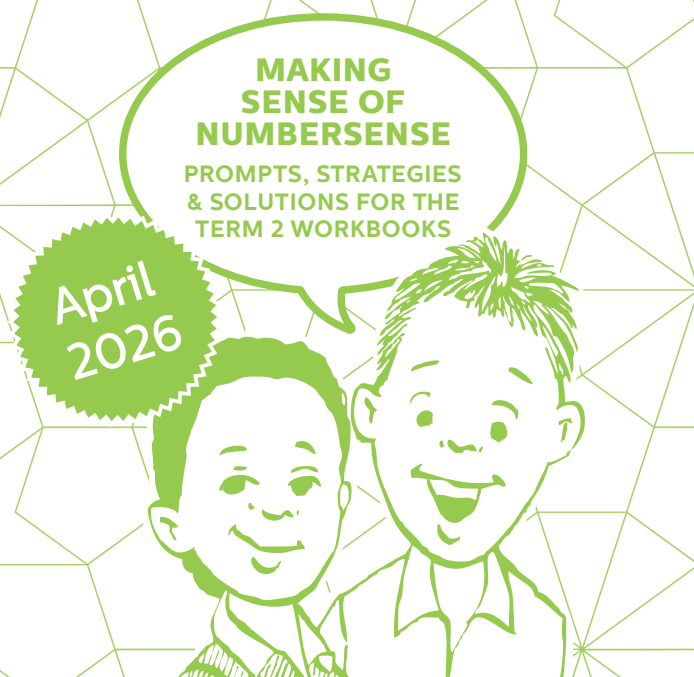
2 NumberSense

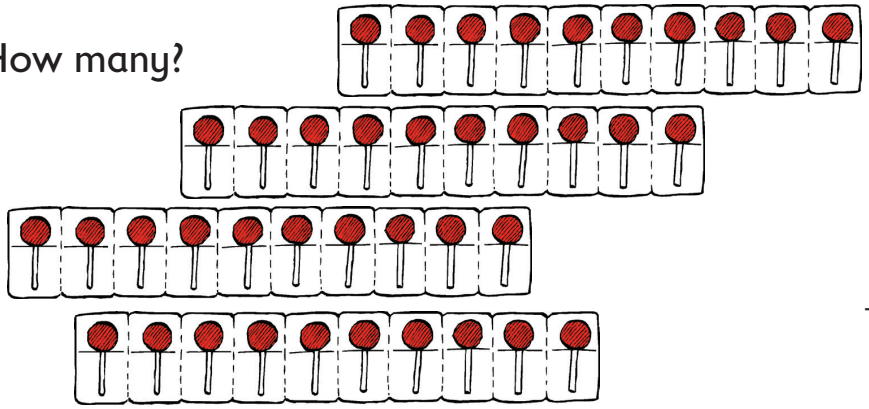
PROMPTS, STRATEGIES & SOLUTIONS

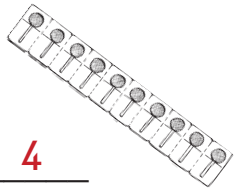
English

Teacher's Guide



1. How many?

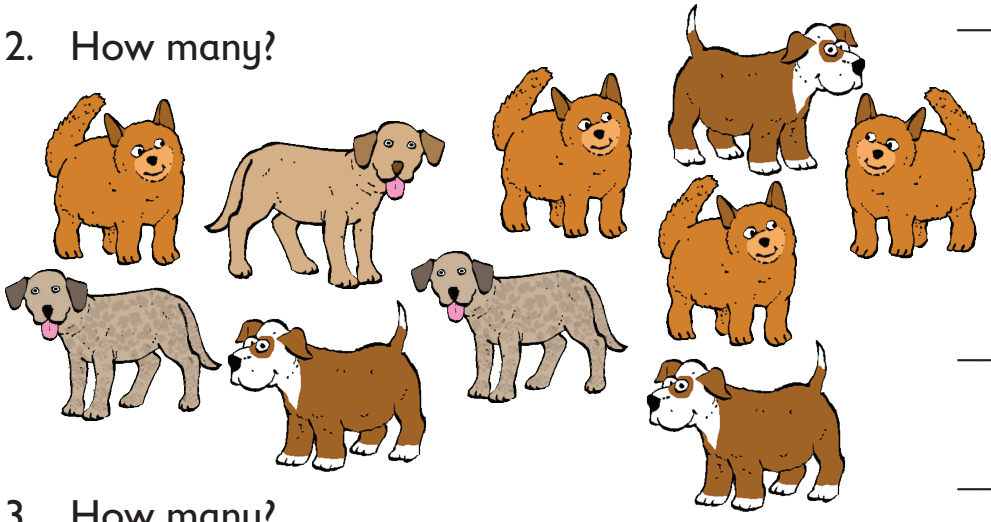




4

40

2. How many?



10

40

3. How many?

? What do you notice?

20

40

4. How many?

40

Planning a lesson

Understanding the page: key prompts

As part of your preparation, complete the workbook page and these key prompts.

Notice

What mathematics does the page intend for children to notice?

- a number can be made up in different ways

Plan

Parallel activities: Which activities on the page require a similar activity to sufficiently prepare the children for the page by scaffolding, checking for understanding (consolidating) or extending?

Rote counting:

- 2s, 5s and 10s to 60

Rational counting:

Place a pile of 60 or more counters in front of the group. Get them to estimate and write down their number in their jotter. As estimating is a new skill for the learners, expect inaccurate estimates. Ask the children how they might count the counters in the most efficient manner. Encourage counting in 2s, 5s, or 10s and group the counters accordingly. Get different children to count the counters in the given pattern. The children should then write the final number in their jotters. Do this for each number pattern. Ask reflection questions such as 'Was your estimate bigger/smaller?' etc. Guide them to notice that whichever way they counted, the result was the same. Finally, get the children to group the counters in 4s. Ask them if they know how to count in 4s - some children may be able to do so. Then ask them which counting pattern that they already know that could help them count the beans. Guide them to see that counting in 4s is simply counting in 2s twice.

Reflect

Use the question bank to select specific questions to ask about this page during the reflection session (to reveal what we want the children to notice).

What did you notice when we counted the number of counters in 2s, 5s and 10s?

There were 60 counters each time.

How many groups of 10 were there?

6 groups

How many groups of 5 were there?

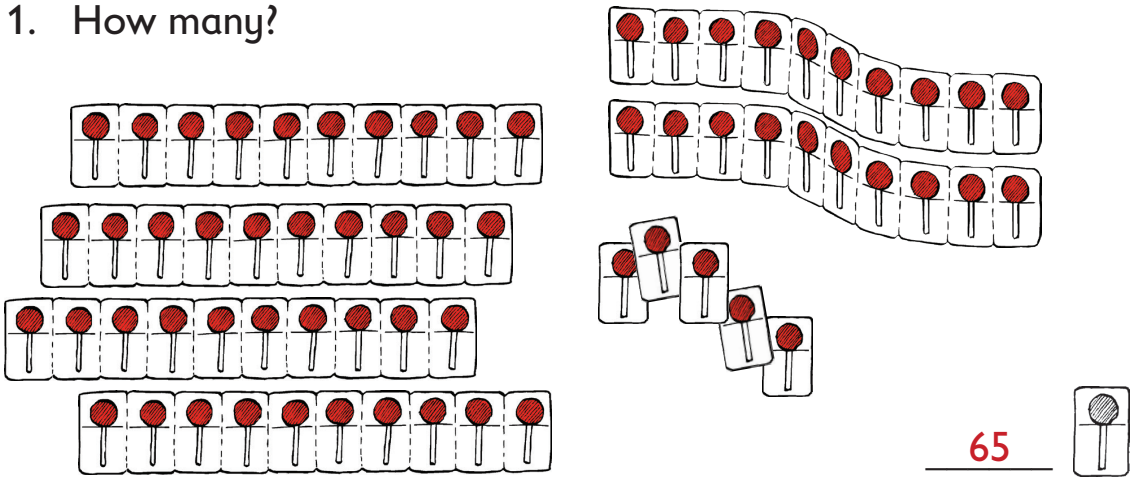
12 groups

What do you notice?

There were double the amount of groups when I counted in 5s.

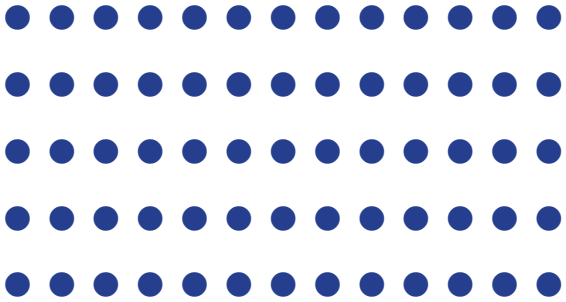
p. 1

1. How many?



65

2. How many?



50

3. Complete.

p. 2

5 ; 10 ; 15 ; 20 ; 25 ; 30 ; 35 ; 40 ; 45 ; 50 ;

55 ; 60 ; 65

This is a number line. Can you see how it works?

4. Complete.

Things to think about

Activity 4: Number line

The purpose of number line activities is to introduce children to number lines as a way of writing numbers in sequence and to compare numbers by writing them in sequence from smallest on the left to largest on the right. We eventually want children to develop a 'mental' number line but at this stage, having the concrete/visual representation is necessary.

In the early number lines, the numbers increase with step sizes of one – in later number lines the step sizes will vary. In Workbook 2, number lines are given with step sizes of 1, 2, 5 and 10. A number line provides a way of focusing on a particular group of numbers. Explain to the children that number lines have arrows at the ends as a way of reminding us that the number line continues in the same way.

With these activities, you should use time on the mat to introduce number lines. A number line can be purchased from the NumberSense website and put on the classroom wall for children to refer to when working on the number line activities.

Number line activities should have been started in Workbook 1 as part of the manipulating number routine.

Mental arithmetic support resource

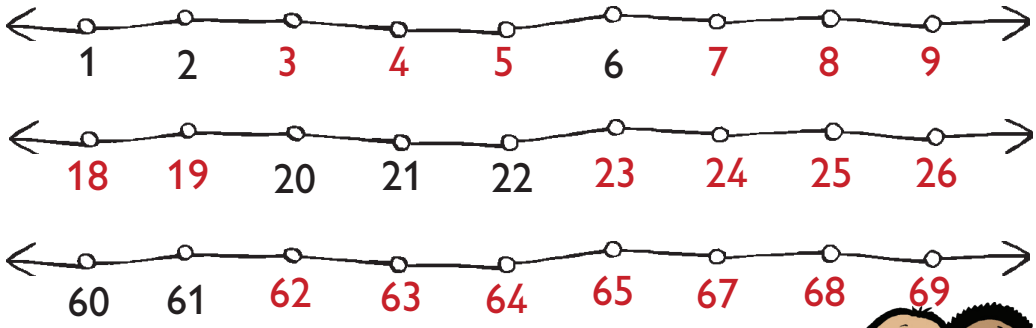
	Single Digit Arithmetic	Arithmetic with Multiples of 10	Completing the 10s	Bridging the 10s	Doubling & Halving	Multiplication Facts	NumberSense Book 2: Page 5		
1							How much is 2, tens?		20
2							How much is 4, tens?		40
3							How much is 5, tens?		50
							"You may use the beans to help you."		
4							How much is 6, tens?		60
5							How much is 6, fives?		30
6							How much is 3, fives?		15
7							I want you to imagine the number line. Find the number 9.		9
8							What is 1 more than 9?	9 + 1 = ☐	10
9							What is 2 more than 9?	9 + 2 = ☐	11
10							What is 2 less than 9?	9 - 2 = ☐	7
11							What is 1 less than 9?	9 - 1 = ☐	8
12							I want you to imagine the number line. Find the number 19.		19
13							What is 1 more than 19?	19 + 1 = ☐	20
14							What is 2 more than 19?	19 + 2 = ☐	21
15							What is 2 less than 19?	19 - 2 = ☐	17
16							What is 1 less than 19?	19 - 1 = ☐	18
							"Do you notice anything?"		12
17							What is 1 less than 12?	12 - 1 = ☐	11

Ask children questions about their number lines such as:

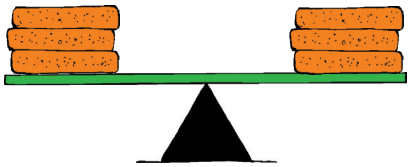
- What is the number that comes before ... ?
- What is the number that comes after ... ?
- What number comes two places after ... ?
- What number comes two places before ... ?
- What do you notice?

The number lines given from page 8 onwards will require that the children work forwards and backwards to complete them.

1. Complete. p. 5



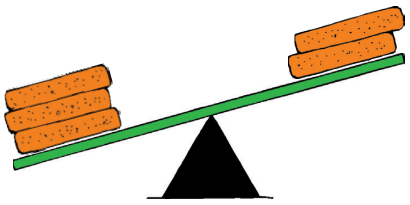
The two sides are equal.



What does it mean if something is equal?

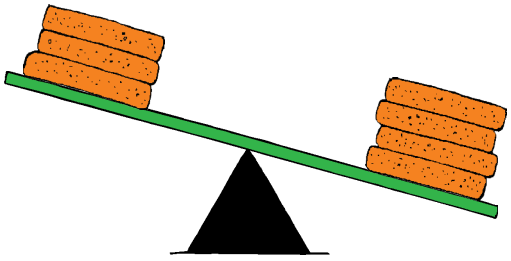
It means that they are exactly the same.

The two sides are not equal.



How can we make the sides equal? 3 is more than 2.
We can add one block to the two blocks. We write: 3 = 2 + 1.

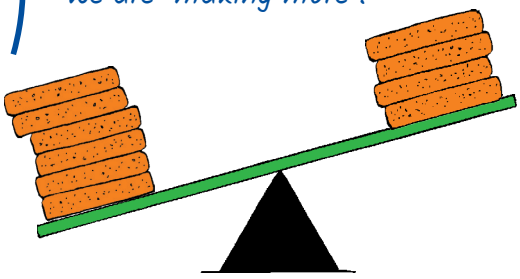
2. Make the sides equal.



3 + 1 = 4

This sign means equal.

This sign means we are adding; we are 'making more'.



6 = 4 + 2

A balance scale is a useful and effective way of illustrating this concept. Counters should also be used to illustrate.

Things to think about

Activity 2: Make the sides equal

In these activities, children practise making the sides equal by adding. Number sentences will become what we call context-free calculations. The completion of these activities is much more about building numbers than it is about 'doing sums'. You will notice that many of these 'make the sides equal' activities involve patterns and relationships that we encourage the children to notice and use. You need to encourage children to notice and use number patterns when 'making the sides equal' and expose children to number combinations (bonds).

With this activity, you should use time on the mat to introduce equivalence. You may want to use a balance or 'see-saw' and ask the children to think about how to balance it. Explain that the equals sign acts as a balance with the left hand side being exactly the same in value to the right hand side. Introduce children to calculations as a means of summarising the concrete and pictorial.

NB! This is an abstract concept! Do not be worried if the children struggle to grasp it the first time. Give them opportunities and plenty of practice in physically 'balancing' the numbers and summarising this with a calculation.

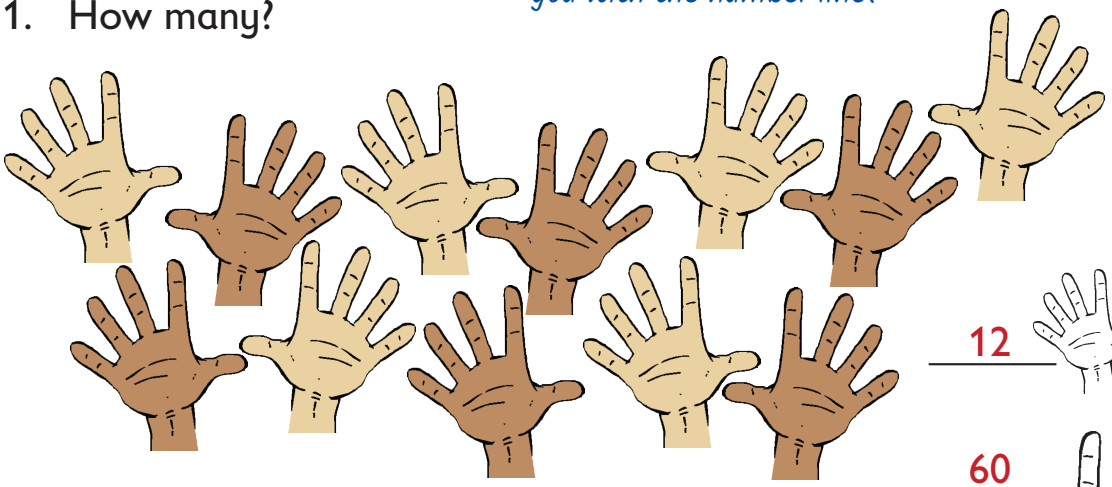
OO + OO = 3 + 4 = 7
O OO

Notes

p. 3

How can the counting of hands help you with the number line?

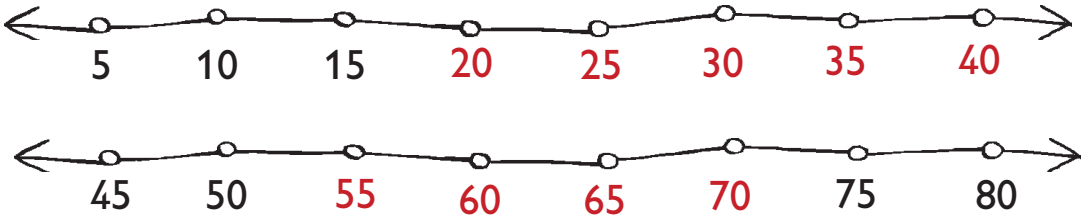
1. How many?



12

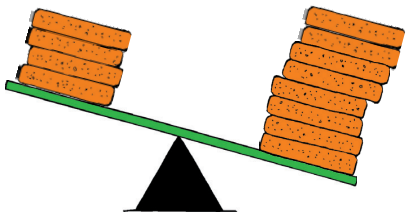
60

2. Complete.

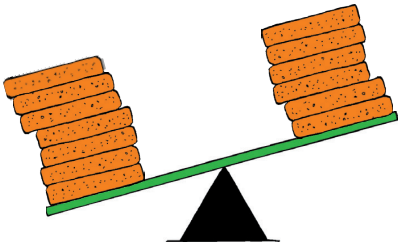


3. Make the sides equal.

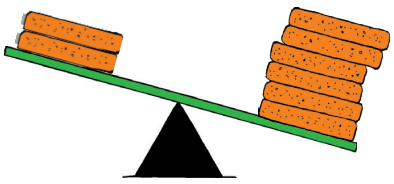
p. 8



4 + 4 = 8



7 = 6 + 1

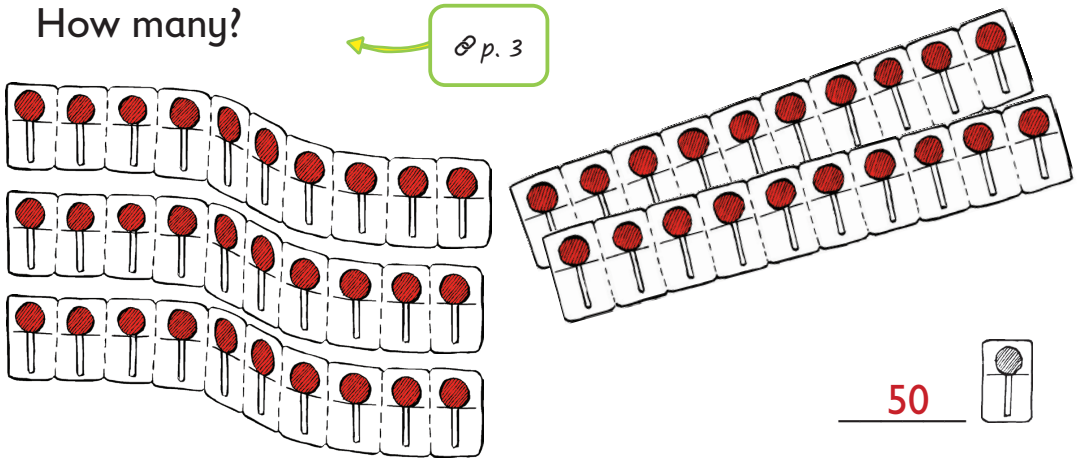


2 + 4 = 6

Notes

1. How many?

p. 3



50

2. Complete.

10 ; 20 ; 30 ; 40 ; 50

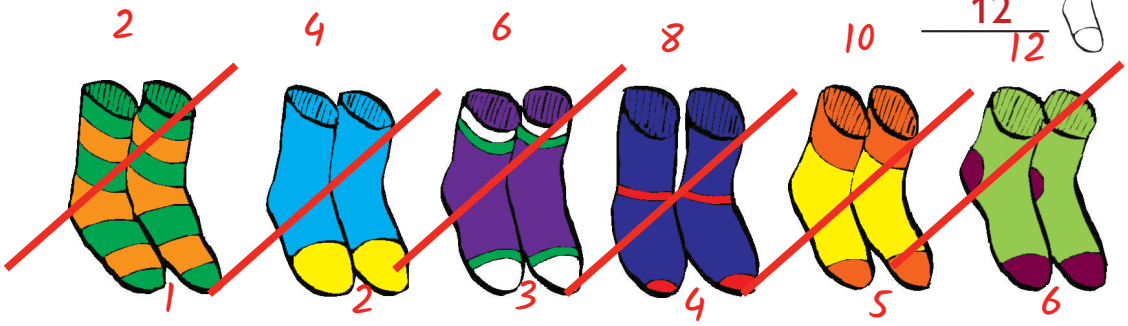
p. 1

3. How many cents? 50 c

p. 17

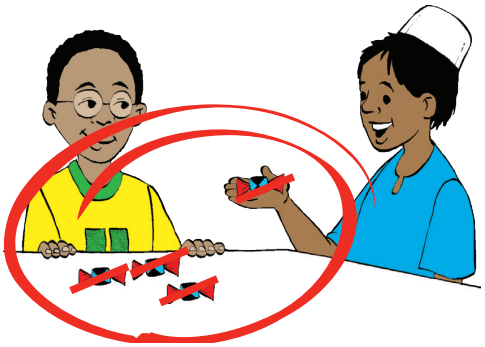
Note: these are just an example of potential, age-appropriate strategies that the children may use.

4. How many socks?



How many boys can put socks on? 6 boys

5. Jan has 3 toffees.
Yusuf gives him 1 more toffee.
How many toffees does Jan have now? 4



Because we expect children to need your support, we also give the problems with illustrations that depict the problem exactly in this workbook. In later workbooks the illustrations will no longer depict the problem exactly.

Things to think about

Activity 4: multiplication/division-type problems

The purpose of problems at this stage in the workbooks is to provoke a natural response from children to a situation. The natural response that the situation provokes is the mathematics that we are trying to develop. In the early workbooks, this is limited to the basic operations. In later workbooks we use problems to introduce fractions, ratio, proportion etc.

The problem type should make you aware of the structure of the problem and the kinds of responses you may expect from the child.

To provoke multiplication/division-like strategies we use problems that involve grouping, sharing, repeated addition and grids and arrays.

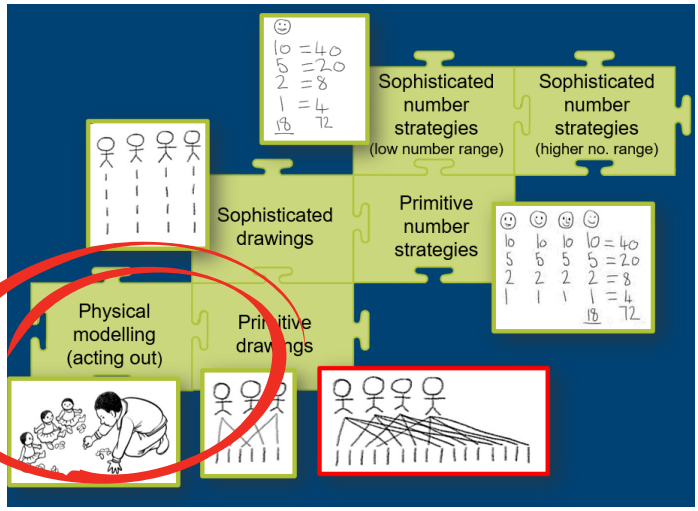
The purpose of these activities is to challenge children to make a plan to solve a problem. Since the solution strategy is not immediately obvious from the way in which the problem is posed, children must understand the problem, make a plan to solve the problem and solve the problem, showing/explaining how they did so. The plan the children make will vary with the child's age and mathematical development.

With these activities, you should have been solving problems during time on the mat for a while. Pose similar problems to the ones in the workbook but with different amounts. Make sure to ask children to describe their solution strategies on the mat. See workbook page 16 notes.

Be sensitive to the developmental needs of the children. If necessary, remember to allow children to model problems directly using counters and teddy bears, to draw a picture or to count on or back to reach the solution.

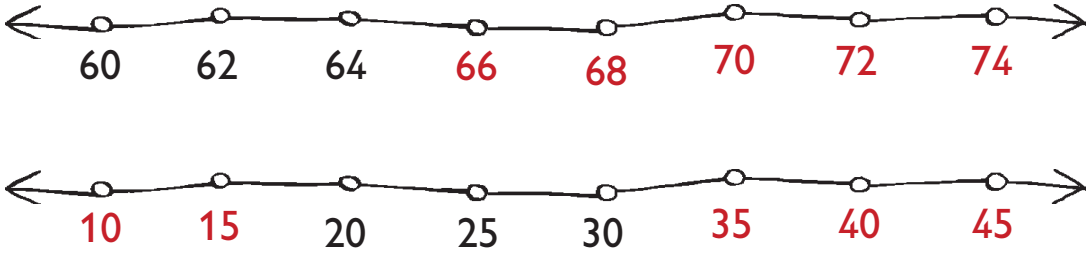
Managing problems

- Pose the problem.
- Children make a plan and solve the problem.
- Teacher monitors the children and identifies:
- Primitive solution that will help those who cannot get started.
- Sophisticated solution that reflects understanding and 'where we want to be'.
- Solutions that represent misunderstanding and/or mistakes.
- Teacher manages discussion and reflection.
- Pose a related problem.



1. Complete.

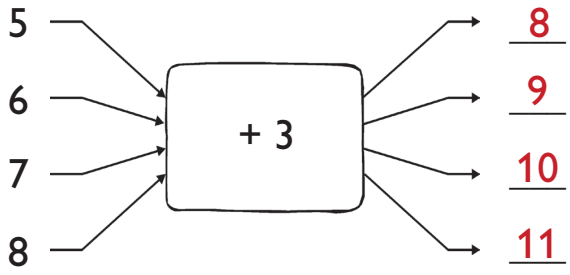
p. 12

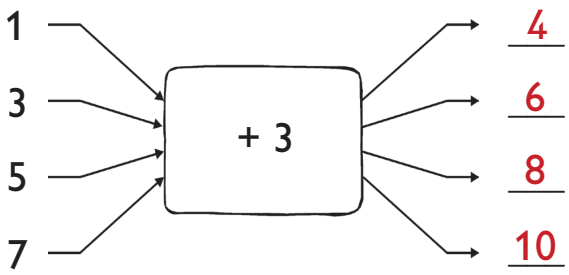


2. Complete.

p. 14

Remember to conduct a daily mental arithmetic routine to strengthen skills such as single-digit arithmetic.





Mental arithmetic support resource

What do you notice?

3. Make the sides equal.

p. 8

10 = 2 + 8

10 = 3 + 7

10 = 4 + 6

10 = 5 + 5

10 = 6 + 4

10 = 7 + 3

10 = 8 + 2

10 = 9 + 1

What is the same?

What is different?

4. Look at the picture.

The picture is a direct representation of the problem.

- How many balloons does Ben have? 5
- 2 balloons burst. How many balloons does Ben have now? 3

Parallel, addition/subtraction-type problems

- Ben has 10 toffees. He eats 3 of his toffees. How many toffees does he have left over?
- Ben has 10 toffees. He eats some of his toffees. He now has 7 toffees. How many toffees did he eat?
- Ben has some toffees. He eats 3 of his toffees. He now has 7 toffees. How many toffees did he start with?

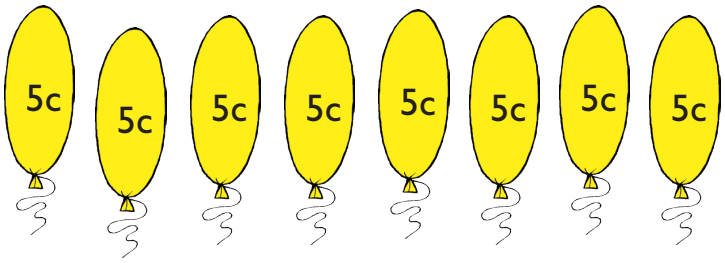
Notes

p. 2

1. Complete.

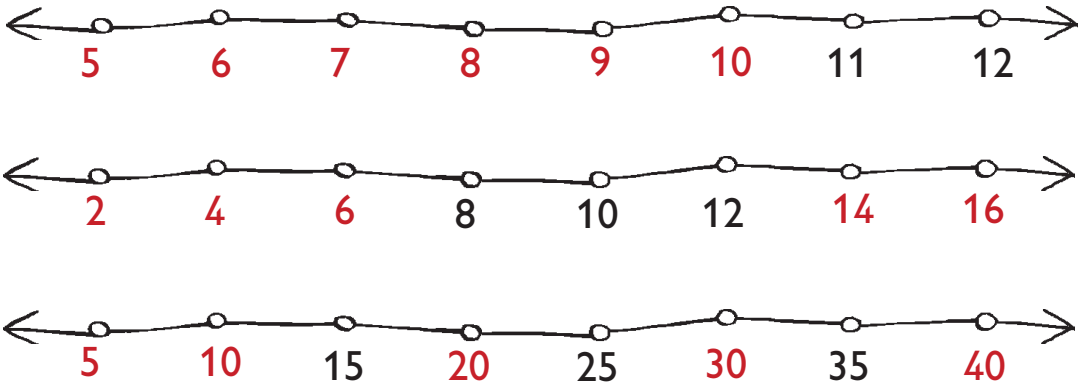
5 ; 10 ; 15 ; 20 ; 25 ; 30 ; 35 ; 40

2. How many cents? 40 c



3. Complete.

p. 5



4. Make the sides equal.

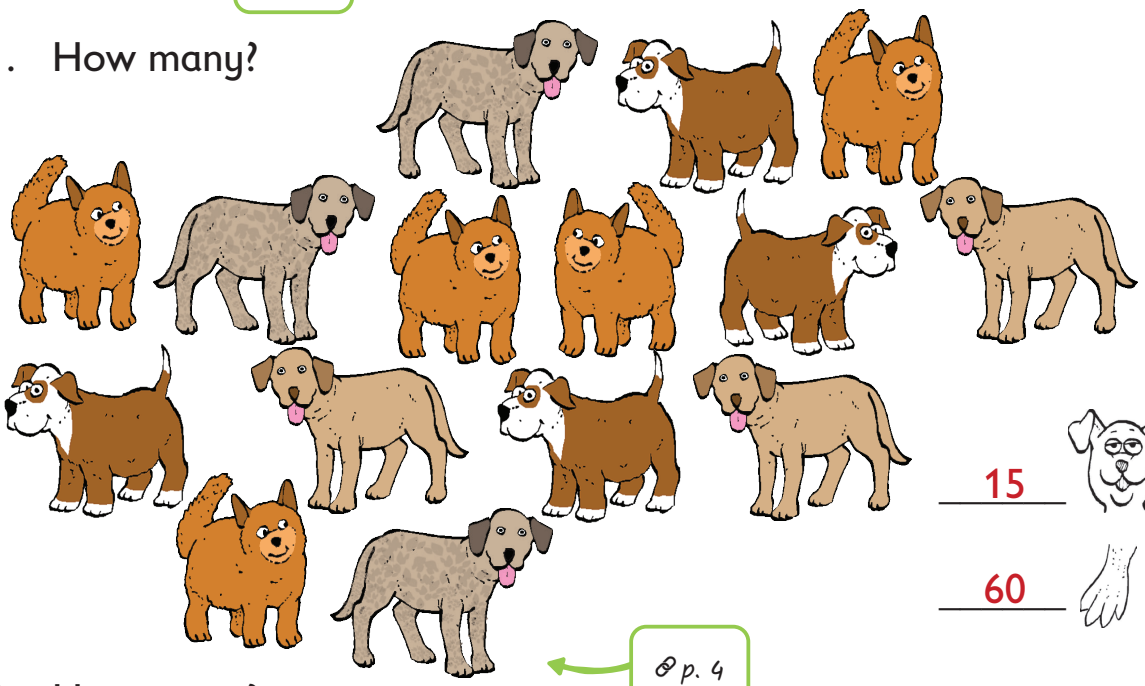
p. 8

3 + 2 = 5	4 + 2 = 6
3 + 3 = 6	4 + 3 = 7
3 + 4 = 7	4 + 4 = 8
3 + 6 = 9	4 + 5 = 9
3 + 7 = 10	4 + 6 = 10
3 + 8 = 11	4 + 8 = 12

Notes

p. 3

1. How many?



15

60

p. 4

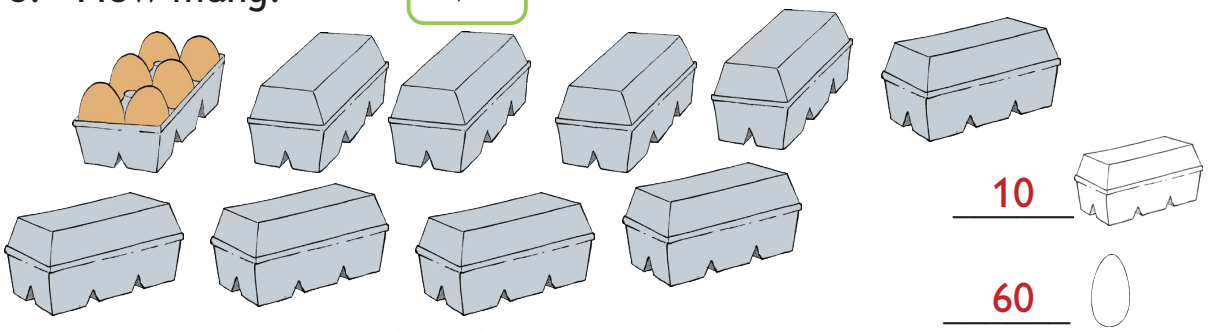
2. How many?

12

60

p. 11

3. How many?



10

60

p. 10

4. Complete.

60 = 15 fours

60 = 12 fives

60 = 10 sixes

What is the purpose of the task?

What mathematics does the page intend for children to notice?

Have we done something like this before?

Will this be problematic for some/all?

Can I make links to similar, previous tasks?

Notes

Put the red Time (event) cards upside down. Select 4 of the cards and turn them over. Arrange the cards in the order of what happens first in the day to what happens last in the day. Describe to your teacher and friends what is happening on each card and why you ordered them as you have.

1. How would you order these activities from what happens first to what happens last in the day?
   Write the number of the activities below.

1	2	3	4
			
I play sport.	I have a bath.	I wake up.	I eat lunch.

3 2 4 1

Sequencing

The activities on pages 58-59 give ideas for practising sequencing, time of day correlation and duration. Similar activities were introduced in grade R. Remember to practise them regularly and not just on the workbook pages.

Compare your solution with a friend.
Discuss why your solution is different to somebody else's.

Planning a lesson

Understanding the page: key prompts

As part of your preparation, complete the workbook page and these key prompts.

Notice

What mathematics does the page intend for children to notice?

- confidence in ordering recurring events in their daily live

- the ability to discuss daily routines using words such as 'before' and 'after'.

Plan

Parallel activities: Which activities on the page require a similar activity to sufficiently prepare the children for the page by scaffolding, checking for understanding (consolidating) or extending?

Work with one group of children at a time on the mat. This activity can be included as a component in the daily mat routine once a week.

- *Shuffle the cards and select 4 to 8 of the red cards.*
- *Place the cards on the mat in no particular sequence.*
- *Ask the children to describe what is happening in each card and to arrange the cards according to the sequence in which the events on the cards occur during a typical day.*
- *Ask the children to explain why they placed the cards in the sequence that they did.*
- *Repeat the activity frequently, changing the cards and adding more cards as children gain confidence in sequencing the events on the cards.*

Reflect

Use the question bank to select specific questions to ask about this page during the reflection session (to reveal what we want the children to notice).

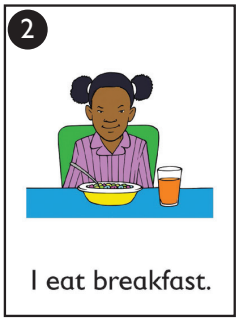
- *What do you do first?*
- *What happens before this picture? And after this one?*
- *What time of the day does it happen?*
- *Do we all do things in the same order? Is there something you do differently to your friend?*
- *What else do you do in the day? When do you do it? Before or after which of these events?*
- *Which event(s) happen in the afternoon? And in the evening?*

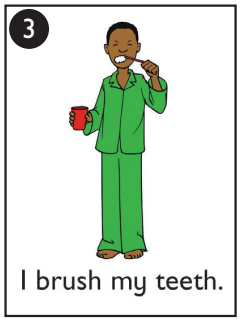
p. 58

Put the red Time (event) cards upside down. Select 3 of the cards and turn them over. Place the cards in order from the activity that takes the least amount of time to the activity that takes the longest.

1. For each set of activities write the numbers in order from the activity that takes the least amount of time to the activity that takes the longest.

2 3 1





3 2 1

Which activity takes the longest?
Does your friend agree?

In this activity we expect children to develop awareness of the duration of events, the ability to compare the duration of two or more events, confidence in ordering events according to duration and the vocabulary to describe the duration of events using words such as: faster, slower, longer and shorter. Encourage children to use time words such as slow, quick, short, fast and long as well as slower, faster, quicker and longer etc. to describe the duration of the events.

Notes