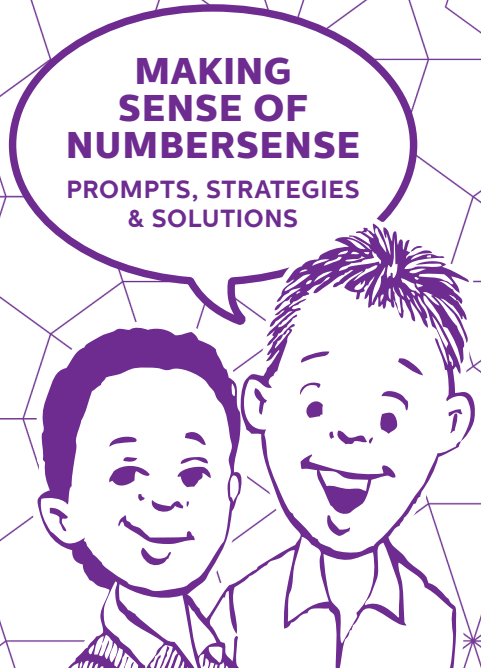
11 NumberSense

COMPREHENSIVE WORKBOOK

English

Teacher Guide



What do you notice? *What is the same? What is different?*

1. Complete.

- 6 ; 12 ; 18 ; 24 ; 30 ; 36 ; 42 ; 48 ; 54 ; 60 ; 66

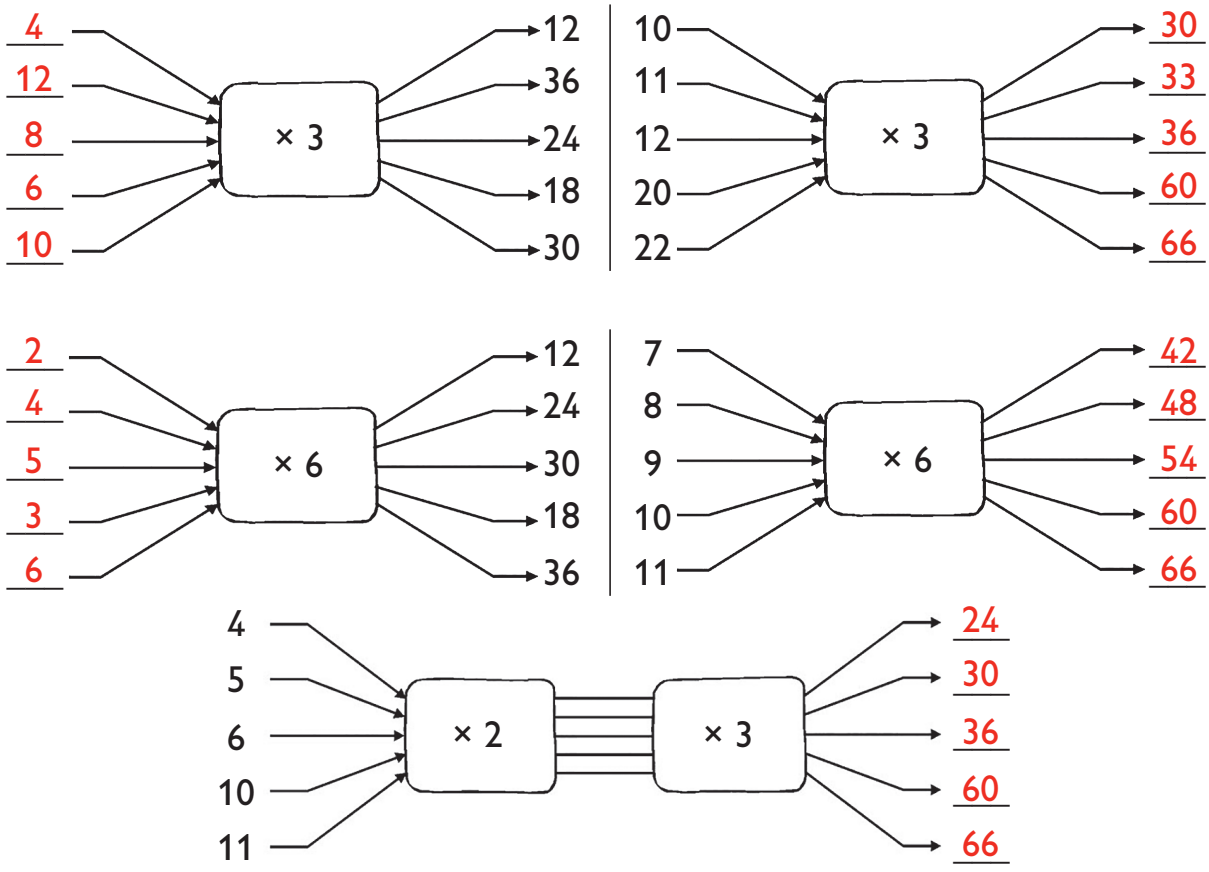
They are all 66.

11 groups of 6 = 66
6 groups of 11 = 66
22 groups of 3 = 66

- 11 ; 22 ; 33 ; 44 ; 55 ; 66
- 3 ; 6 ; 9 ; 12 ; 15 ; 18 ; 21 ; 24 ; 27 ; 30 ; 33 ; 36 ; 39 ; 42 ; 45 ; 48 ; 51 ; 54 ; 57 ; 60 ; 63 ; 66

45 is a multiple of 3. Can you find another number that 45 is a multiple of?

2. Complete.



3. Sara buys 2 dresses. Each dress costs R42. How much change will she get from R100?

R16 change

Things to think about

Activity 2: Two-step flow diagrams

While two-step (double) flow diagrams were first introduced in Workbook 9, take the time to practise a few examples with the class before children complete the page independently. These flow diagrams provide practice in exploring patterns, rules and relationships through breaking down and building up numbers in different ways.

Ask questions such as:

? What do you notice?

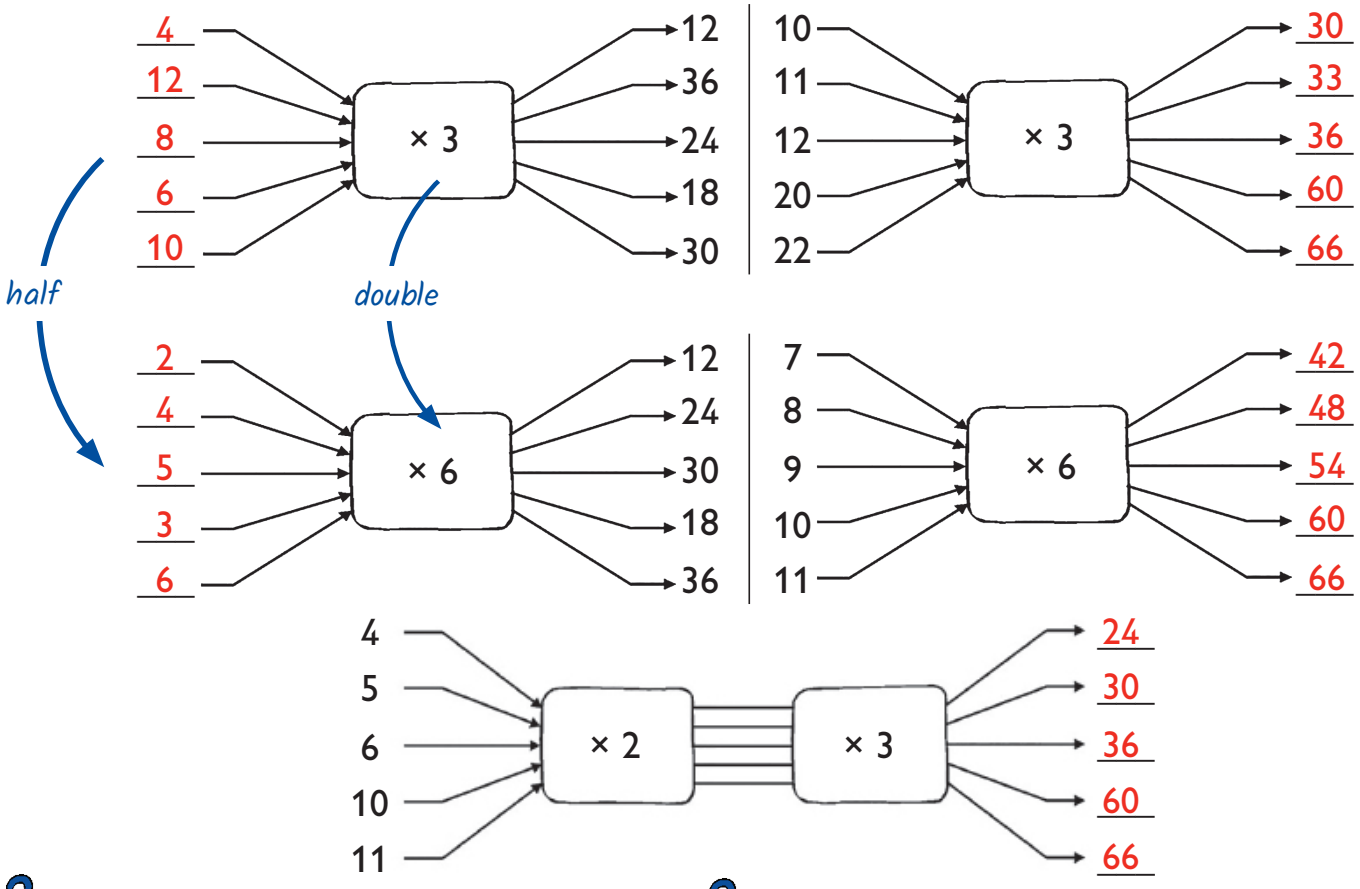
? How does this make calculating easier? Is there another way?

? How did you complete the flow diagrams?

I used Activity 1 to help me.

I used doubling and halving.

I counted in groups of 3 and groups of 6.



? What is the same?

The numbers that come out are the same.

? What is different?

For 'x3', the numbers that go in are double the numbers that go in for 'x6'

? What do you notice?

I notice that 'x3 x2' is the same as x6.

1. 

Use these coins and make up R1,20 in as many different ways as you can.

Investigations

2. Work out the rule and complete.

		54		
	24		30	
12		12		18
7	5		7	11
4	3	2	5	6

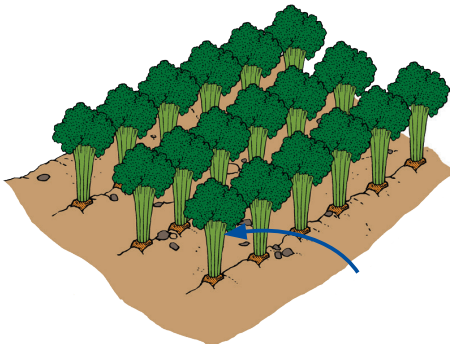
		62		
	31		30	
15		15		14
6	8		6	7
2	3	4	1	5

		67		
	35		32	
20		15		17
12	8		7	10
7	5	3	4	6

		480		
	112		128	
28		28		36
8	6		8	10
3	1	2	2	3

3. Granny sells carrots from her garden. She has 66 carrots. She puts 8 carrots in a bag. How many bags can she fill?

8 bags



Did you:

- ☐ draw a picture?
- ☐ make a list?
- ☐ use a calculation?

Things to think about

Activity 1: Investigation

Encourage children to be systematic. Reflect on how they went about doing the activity.
Did they:
- choose coins randomly?
- start with the 'biggest' coins first, 50c, then 20c, then 10c then 5c?
- use another strategy?

Activity 2: Pyramids

Pyramids with an additional rule were first introduced in Workbook 9 (p.11).

In previous workbooks, all of the pyramids involved the addition of the numbers in two adjacent cells. Each pyramid must now be examined carefully to determine if there is an additional rule and what that rule is.

Use a teacher-led activity to introduce pyramids with an extra rule.

Ask questions such as:

1

? What is 2 plus 3?

2 plus 3 is 5

? What must I do to 5 to get 10?

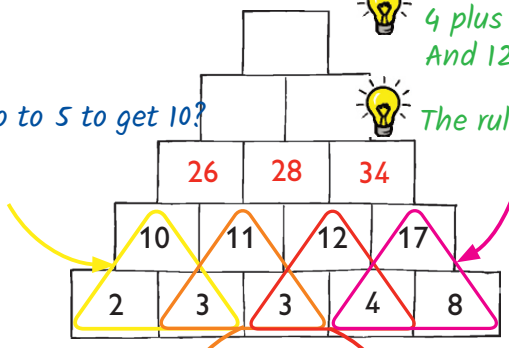
I must add 5.

2

? Let's double check if the rule works.

4 plus 8 is 12.
And 12 plus 5 is 17.

The rule for this pyramid is + 5.



It is important to test this for at least 3 calculations to ensure the rule works for the whole pyramid.

3 3 + 3 = 6 + 5 = 11

4 3 + 4 = 7 + 5 = 12

Activity 3: Multiplication and division-type problems

Some sharing and grouping situations will involve remainders.
For this particular problem, the remainder has no impact on the answer. The class and teacher can decide what to do with the left over carrots.

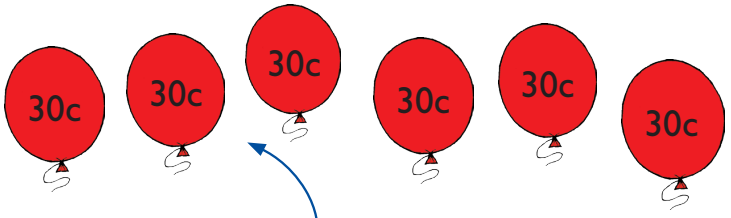
Model correct mathematical notation by recording the children's strategies and reasoning, helping them connect their thinking to clear and accurate mathematical writing.

I know that 8 x 8 = 64. There are 2 left over.
Granny can fill 8 bags

For example:
8 x 8 + 2 = 66

What is the same?
What is different?

1. How many cents? 180 c



What do you notice?

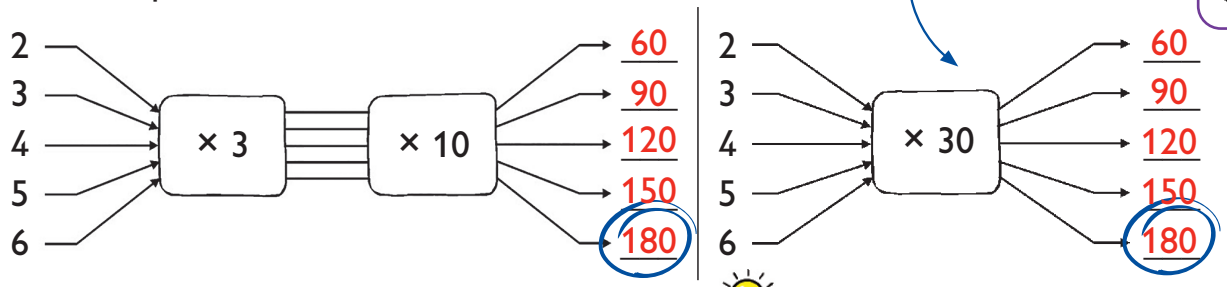
2. Complete.

30 ; 60 ; 90 ; 120 ; 150 ; 180

All three activities are counting in 30s.

p.1

3. Complete.



'x3 x 10' is the same as 'x30'

4. Complete the tables.

Netball teams	1	2	3	4	5	10	20	21
Players	7	14	21	28	35	70	140	147

Soccer teams	1	2	3	4	5	10	20	22
Players	11	22	33	44	55	110	220	242

5. Help Ben work out what he needs to bake 4 cakes.

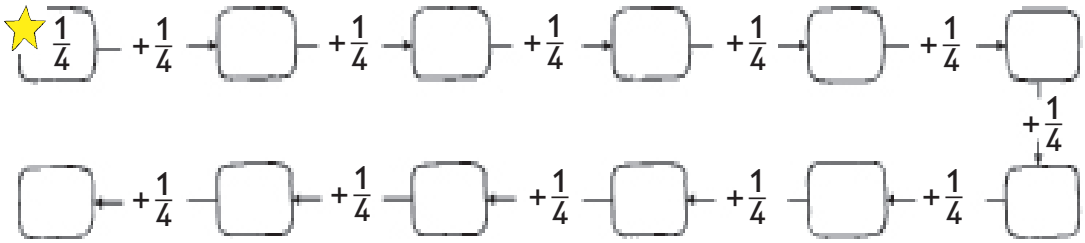
1 cake	4 cakes
1 egg	4 eggs
$\frac{1}{2}$ cup oil	2 cups oil
3 cups flour	12 cups flour
$1\frac{1}{2}$ cups milk	6 cups milk
$1\frac{1}{4}$ cups sugar	5 cups sugar
$2\frac{1}{2}$ teaspoons baking soda	10 teaspoons baking soda

Ideas for teaching

Activity 5: Fractions (measurement)

This is the first time children calculate with quarters. Consider the following activities to better prepare children for the activity.

- *Practise counting in quarters aloud:*
  1 quarter, 2 quarters, 3 quarters, 1 whole, 1 and 1 quarter, 1 and 2 quarters, 1 and 3 quarters, and so on.
- *Use a number chain that records the same counting sequence using written notation.*



- *Give children a problem that naturally leads to answers involving quarters.*
  For example:

  Four children share 5 chocolate bars equally. How much does each child get?

  Four children share 6 chocolate bars equally. How much does each child get?

  Encourage children to share their strategies and explain their reasoning.

- *Practise a similar example to the one in Activity 5, ensuring they understand the activity and are able to make a plan.*

Scaffold

1 cake	2 cakes
1 egg	2 eggs
$\frac{1}{2}$ cup oil	1 cus oil
3 cups flour	6 cups flour
$1\frac{1}{2}$ cups milk	3 cups milk
$1\frac{1}{4}$ cups sugar	$2\frac{2}{4}$ cups sugar
$2\frac{1}{2}$ teaspoons baking soda	5 teaspoons baking soda

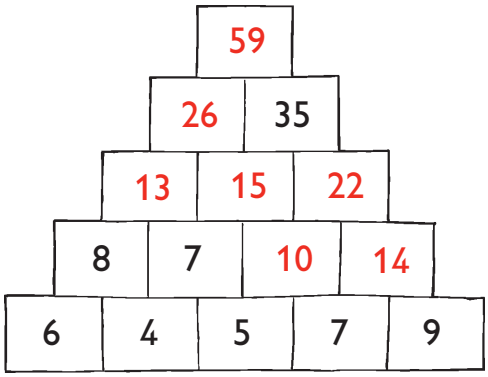
Extend

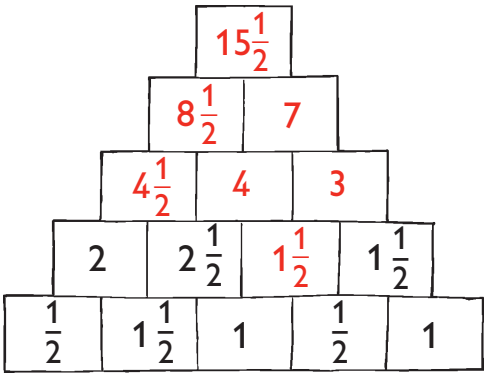
1 cake	8 cakes
1 egg	8 eggs
$\frac{1}{2}$ cup oil	4 cups oil
3 cups flour	24 cups flour
$1\frac{1}{2}$ cups milk	12 cups milk
$1\frac{1}{4}$ cups sugar	10 cups sugar
$2\frac{1}{2}$ teaspoons baking soda	20 teaspoons baking soda

1. Sort from smallest to biggest.

243 ; 283 ; 324 ; 342 ; 423 ; 432

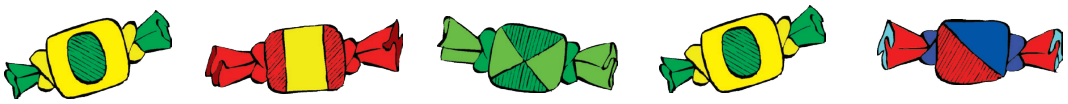
2. Work out the rule and complete.





3. It is Yusuf's birthday. His mother buys him a present for R125. His father buys him a present for R186. His brother buys him a present for R87. How much did the 3 presents cost altogether?

R398



4. Yusuf has 10 friends at his party. There are 125 toffees in a bowl. Share the toffees equally between Yusuf and his friends. How much does each friend get?

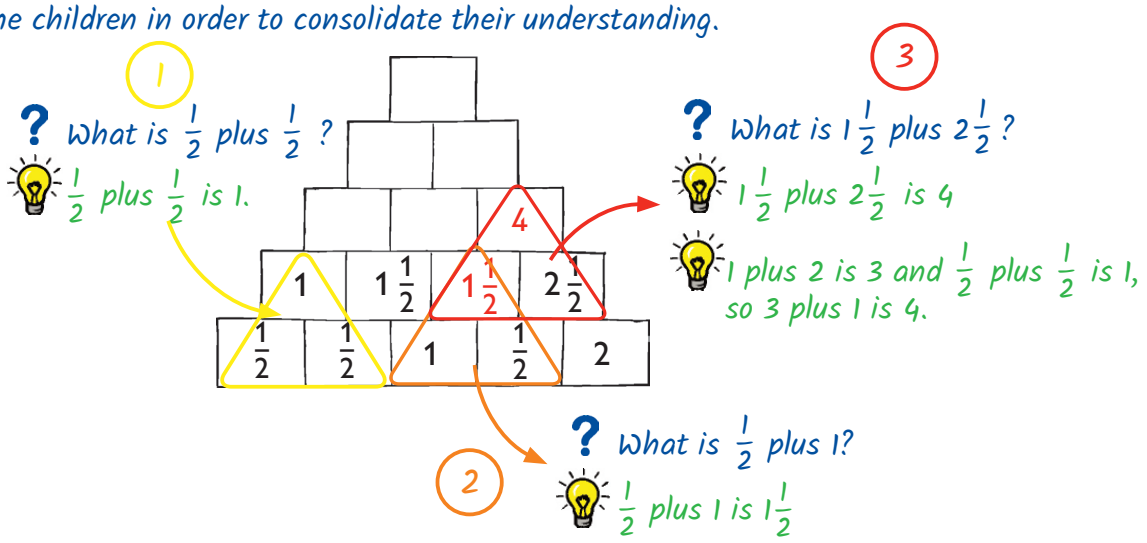
11 toffees (4 left over)

Don't forget Yusuf!

Things to think about

Activity 2: Pyramids with fractions

This is the first introduction to fractions in pyramids. Take the time to practise similar examples with the children in order to consolidate their understanding.



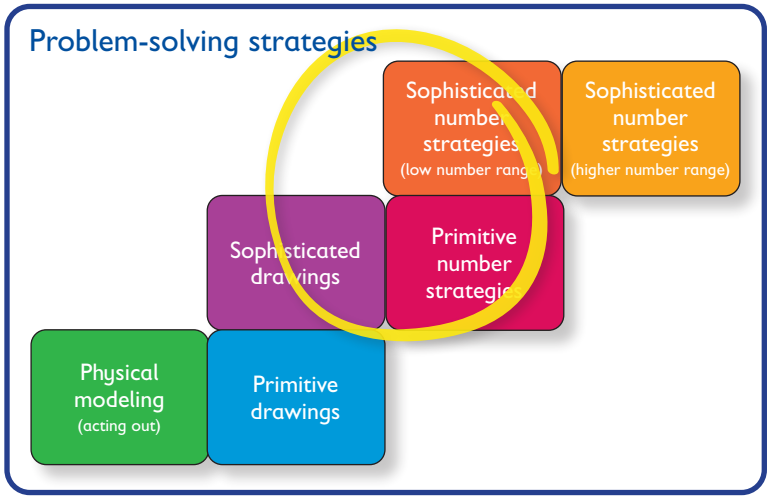
Activity 4: Multiplication and division-type problems

Children have had plenty of practice with sharing problems. Be curious about how they are solving these problems and where they are on their journey toward efficiency. Practise a parallel activity and deliberately select two or three strategies that highlight different levels of efficiency. This will encourage children to adopt more efficient methods when completing the activity on the page.

For example:

> ***Jan has 10 friends at his party. There are 136 toffees in a bowl. Share the toffees equally between Jan and his friends. How much does each friend get?***

* *It is important to note that at this grade and number range, it is no longer efficent to be drawing pictures. Children should be using more sophisticated number strategies. In this activity, some children may recognise that they can use the division symbol (introduced on page 17) to solve the problem. Use a whiteboard to track and facilitate children's thinking and reasoning.*



Notice the connections on this page.

1. Complete.

15 ; 30 ; 45 ; 60 ; 75 ; 90 ; 105 ; 120 ; 135 ; 150 ;
165 ; 180 ; 195 ; 210 ; 225

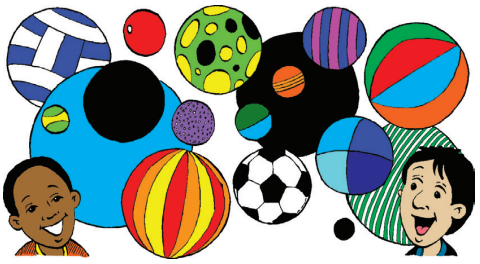
2. Complete.

15 +15→ 30 +15→ 45 +15→ 60 +15→ 75 +15→ 90 +15→ 105 +15→ 120 +15→ 135 +15→ 150 +15→ 165 +15→ 180 +15→ 195 +15→ 210 +15→ 225 +15→ 240 +15→ 255 +15→ 270

What is?

15 × 6 = 90 30 ÷ 2 = 15

15 × 8 = 120 45 ÷ 3 = 15



3. Make the sides equal.

150 − 9 = 141	230 − 9 = 221	280 − 19 = 261
150 − 8 = 142	230 − 8 = 222	280 − 18 = 262
150 − 7 = 143	230 − 6 = 224	280 − 17 = 263
150 − 6 = 144	230 − 4 = 226	280 − 15 = 265
150 − 5 = 145	230 − 3 = 227	280 − 14 = 266
150 − 2 = 148	230 − 2 = 228	280 − 13 = 267

4. One ball costs R15. How many balls can you buy if you have R200?

13 balls

? How did you work this out? ? Can we use Activity 1 or 2 to help us?

5. One cupcake costs 30c. How many cupcakes can Sara buy if she has R2,50?

8 cupcakes

? Can we use the same strategy as Activity 4?

? What is double 15? How could we use this to help us?

Did you:

- ☐ make a list?
- ☐ use a table?
- ☐ use a calculation?

Additional prompts and strategies

Most activities on this page focus on 15s, whether counting in 15s, multiples of 15 or grouping in 15s. The intention is for children to recognise the connections between the activities and use the completed activities to support their thinking in others. Pose questions that guide children to notice these patterns and relationships.

- What do you notice about the activities on this page?
- What is the same? What is different?
- How many 15s are there is 30? And 60? And 120?
- What is 15 x 2? And 15 x 4? And 15 x 8?
- Can we use this to help us solve the problems in Activity 4 and 5?

Activity 4 and 5: Grouping and sharing type problem involving money

Anticipated strategies might include:

I used Activity 1 to help me.

I added R15 until I ran out of money.

R15 + R15 + R15 + R15 + R15 + R15 + R15 + R15 + R15 + R15 + R15 + R15 + R15

R30 R60 R90 R120 R150 R180 R195

13 groups of R15 make R915. so I can buy 13 balls.

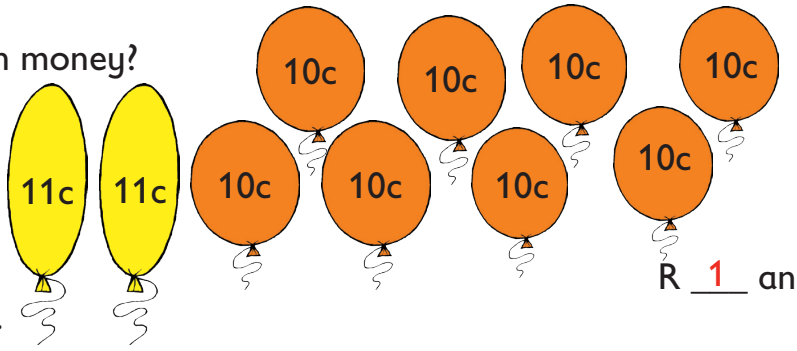
I used a table to help me.

No. of balls	1	2	4	8	12	13
Rand	15	30	60	120	180	195

R15 x 10 = R150 and R15 x 3 = R45
and R150 + R45 = R195 so you can buy 13 balls with R200.

Can you make Rands and cents straight away?

1. How much money?



102 c

R 1 and 2 c

2. Complete.

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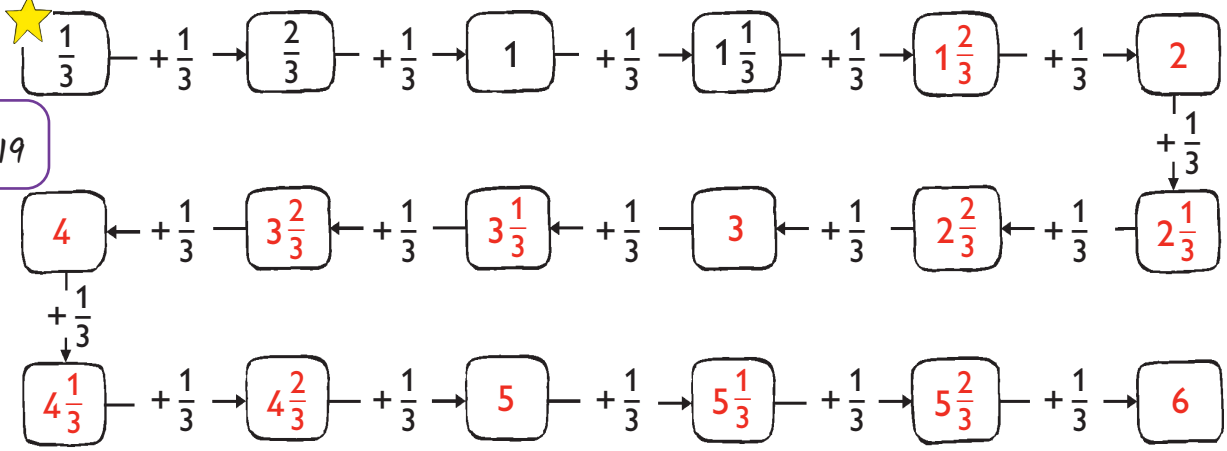
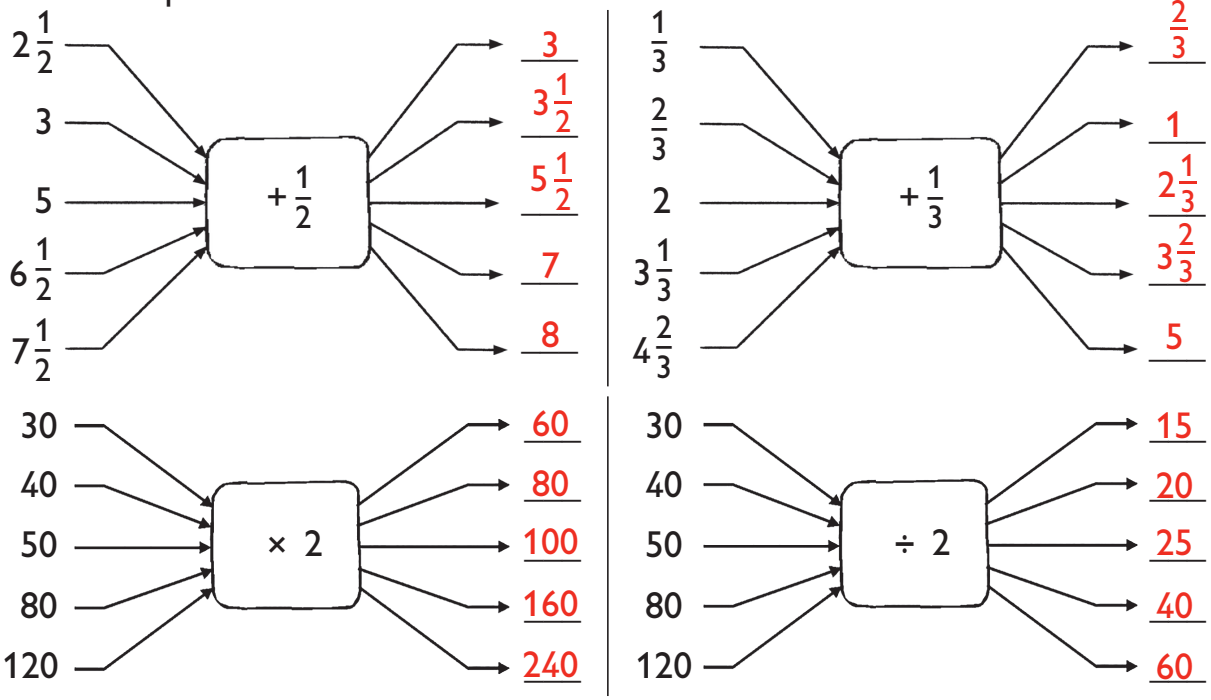


3. Complete.



p.17

4. It takes $2\frac{1}{2}$ metres of material to make a dress. Fundi's mother wants to make 4 dresses. How much material does she need?

10 metres

Additional prompts and strategies

Activity 2: Number chains with fractions

This is only the second time working with thirds of more than one unit.

Consider the following to get the children started:

- Practise rote counting in $\frac{1}{3}$s to 'hear' the pattern.
- Download the number chain template to create a similar chain
- Present a sharing problem that produces thirds. For example:

  Three friends share 5 chocolate bars. How much does each friend get?

Ask questions such as:

How many thirds are there is 1? And 2? And 3?

There are 3-thirds in 1, 6-thirds in 2, 9 thirds in 3.

Its like counting in 3s.

How can you check that you are correct? Is there a pattern?

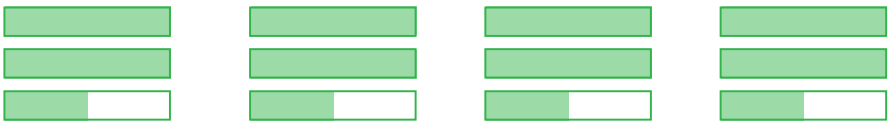
Every third block is counting in ones: 1; 2; 3; 4; ...

Every time we have 3-thirds, we count a whole one.

Activity 4: Fraction problems

Anticipated strategies might include:

I drew a picture to help me.



10 metres

I added $2\frac{1}{2} + 2\frac{1}{2} + 2\frac{1}{2} + 2\frac{1}{2}$ for the 4 dresses.

$2 + 2 + 2 + 2 = 8$ and $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 2$

Fundi's mother needs 10 metres of material.

I know that $2\frac{1}{2} + 2\frac{1}{2} = 5$

And double 5 is 10 metres

1. Complete.

11 ; 22 ; 33 ; 44 ; 55 ; 66 ; 77 ; 88 ; 99 ;

110 ; 121 ; 132 ; 143 ; 154 ; 165 ; 176 ; 187 ; 198

2. Complete. *These numbers are multiples of ___ ? How do you know?*

9 +9→ 18 +9→ 27 +9→ 36 +9→ 45 +9→ 54 +9↓ 63 +9← 72 +9← 81 +9← 90 +9← 99 +9← 108 +9↓ 117 +9→ 126 +9→ 135 +9→ 144 +9→ 153 +9→ 162

3. There are 11 players in a soccer team. Complete the table.

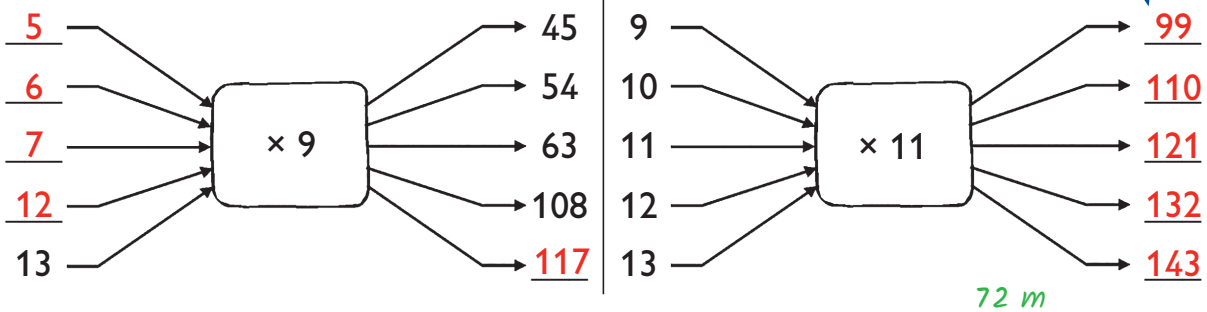
Can you use Activity 1 to help you complete the table?

Soccer teams	3	8	9	10	11	12	13	15
Players	33	88	99	110	121	132	143	165

9 is one less than 10, so 5 × 9 = 5 × 10 − 5 = 45

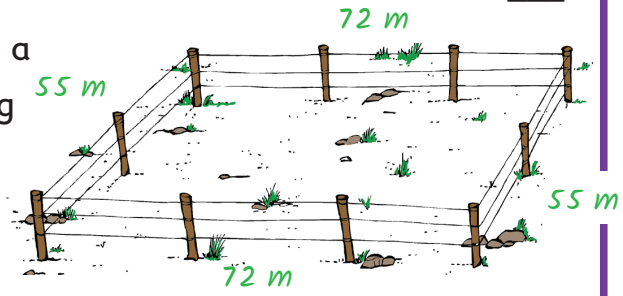
11 is one more than 10, so 9 × 11 = 9 × 10 + 9 = 99

4. Complete.



5. Mr Singh wants to put a fence around a rectangular field. The field is 72 m long and 55 m wide. How much fencing does he need?

254 m



6. A rectangular field is 42 m long and 28 m wide. Fundi runs 4 times around the field. How far did she run?

560 m

Additional prompts and strategies

This page draws attention to multiples of 9 and multiples of 11. While children can use one activity to help them solve other activities, children may also realise that 9 is one less than 10 and that 11 is one more than 10 and use this to complete the activities.

Ask questions such as:

? What do you notice about the activities on the page?

? What is the same? What is different?

? Can you use the Activity 1, 2, 3 to help you with Actvity 4?

Activity 5: Mixed problems

Anticipated strategies might inculde:

I used the picture to help me.

I added the four sides of the field.

72 + 55 + 72 + 55 = 144 + 110 = 254 m

I doubled the two sides to get my answer.

Double 72 = 144
Double 55 = 110 > = 254 metres

For children more confident:

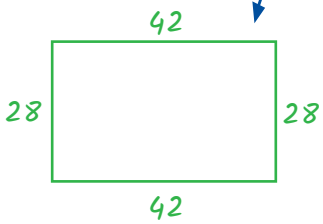
? How many soccer players in 13 + 15 teams?

? How many soccer players in 25 teams?

Activity 6: Mixed problems

Anticipated strategies might inculde:

I drew a picture to help me.



Drawing is an important problem solving strategy for this new spatial-type problem

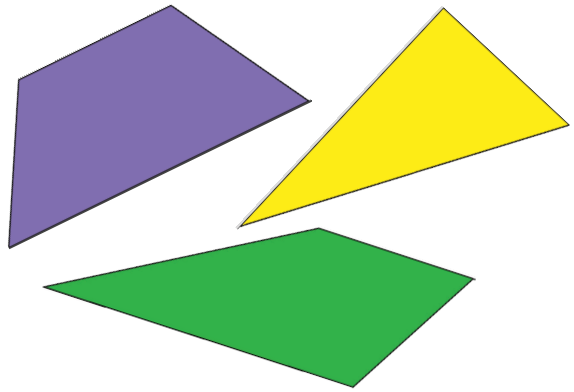
I added the four sides of the field and then multiplied my answer by 4.

42 + 28 + 42 + 28 = 140 metres

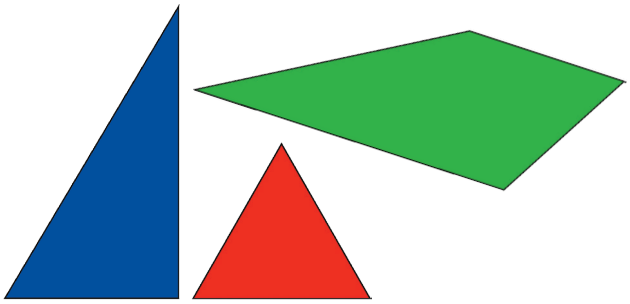
140 m x 4 = 560 metres

Fundi runs 4 times round the field.

1. Use a separate piece of paper. For the given Mosaic Puzzle pieces, make a shape that can be folded in half in only one way. Cut out the shape, fold it and stick it below.



2. Can you use these pieces to make a different shape that can be folded in half in two different ways? Cut out the shape, fold it and stick it below.



We call the fold line a line of symmetry of the shape.

Compare your solutions with a friend.

Things to think about

Activity 1 and 2: Symmetry

This is the first formal introduction to symmetry. Symmetry first appears in Workbook 4 (p.49) in the NumberSense workbooks, and can also be found when using the Attribute Block Activity Cards (Card 40).

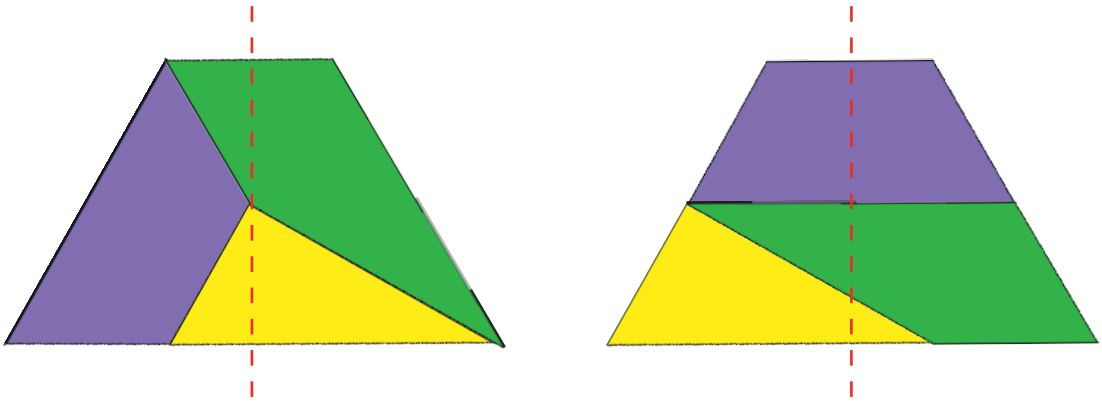
Symmetry is an important concept that helps children notice and describe patterns and relationships in shapes and objects. In the Foundation Phase, children begin by exploring symmetry in familiar, everyday contexts—such as their own bodies, faces, leaves, butterflies and simple shapes.

Encourage children to fold, draw and build to see how one side can match the other. Using mirrors, paper folding and practical activities helps them to recognise lines of symmetry in a hands-on way.

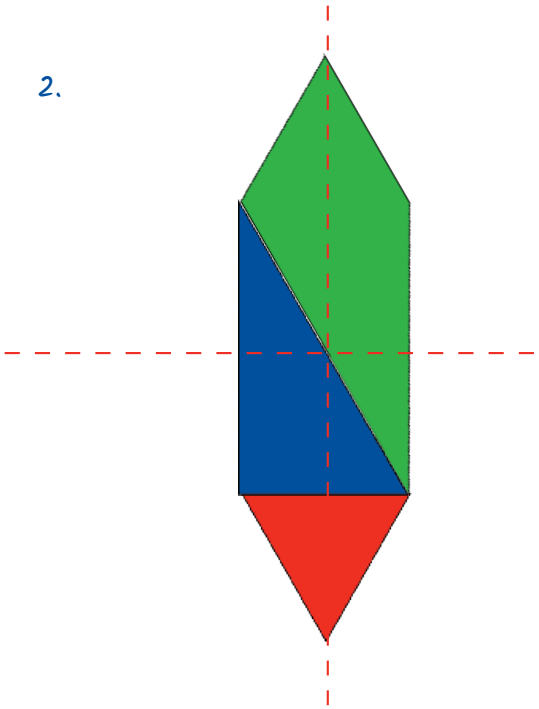
The focus should be on exploration and discussion rather than formal definitions. As children become more confident, they can begin to identify and create symmetrical patterns and shapes, deepening their understanding through play and investigation.

Some solutions might include:

1.



2.



While some children might get distracted by the pieces that make up the shape, make it clear that it is the outlined shape that we consider for symmetry.

p.54

1. There are 60 minutes in one hour. Complete the table.

Hours	1	2	3	4	5	6	7	8
Minutes	60	120	180	240	300	360	420	480

+1 +1 +1

+60 +60 +60

How can we use the table to help us?

- How many minutes are there in 10 hours?
  600 minutes
- How many minutes are there in 12 hours?
  720 minutes

2. Thabo runs for 60 minutes every day.
   - Altogether, how many minutes does he run in 2 days?
     120 minutes
   - Altogether, how many minutes does he run in 5 days?
     300 minutes
   - Altogether, how many minutes does he run in 1 week?
     420 minutes
   - How many hours does he run in one week?
     7 hours
3. Zintle feeds her baby every 3 hours. Write down the times that she must feed her baby. *What do you notice?*

   06:00 ; 09:00 ; 12:00 ; 03:00 ; 06:00 ; 09:00 ; 12:00 ; 03:00 ; 06:00
4. Sandi feeds her baby every 4 hours. Write down the times that she must feed her baby. *Is there a pattern?*

   06:00 ; 10:00 ; 02:00 ; 06:00 ; 10:00 ; 02:00 ; 06:00
5. Palesa feeds her baby every 6 hours. Write down the times that she must feed her baby. *What is the same? What is different?*

   06:00 ; 12:00 ; 06:00 ; 12:00 ; 06:00

Things to think about

Time trajectory

Time is a concept that requires daily practice and constant referencing throughout the day. It is expected that the activities suggested in the workbooks will form part of the daily classrooom discussion and activities. Doing each activity once will not suffice.

The language of time
- *Yesterday I went to the shops with my mom.*
- *We are going home later.*
- *I brush my teeth after breakfast.*

Sequencing
- *I wake up, then I get dressed, then I eat breakfast.*

Time of day correlation
- *I do homework in the afternoon.*

YOU ARE HERE

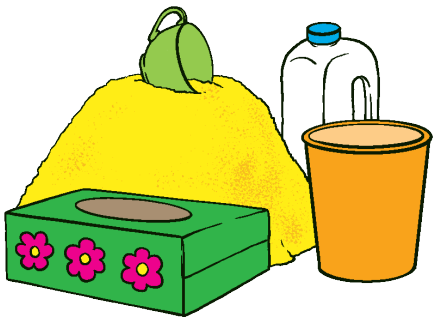
Duration
- *It takes me longer to walk to school than to brush my hair.*

Telling time
- *Analogue and digital*
- *Hours, minutes, half hours, quarter past and quarter to*

YOU ARE HERE

Elapsed time
- *There are 45 minutes between the start of mathematics and the start of break.*

Solving problems with time
- *If Jabu takes 15 minutes to walk to school and 15 minutes to walk home each day, how many minutes does he spend walking to and from school each week?*



For the three containers that your teacher will provide, compare the capacity by counting the number of cups of sand that fill the containers.

The table has the results from three groups who compared the capacity of a yoghurt tub, a tissue box and milk bottle using cups of sand.

	Group 1	Group 2	Group 3
Yoghurt tub	2 cups	1 cup	4 cups
Tissue box	5 cups	More than 2, less than 3 cups	9 cups
Milk bottle	7 cups	More than 3, less than 4 cups	14 cups

1. Compare the groups' results.
   - Which group used the largest cup? Explain why you say so.

     Group 2. They used the least cups to fill the container

   - Which group used the smallest cup? Explain why you say so.

     Group 3. They use the most cups to fill the container.

2. Caitlyn used 150 marbles to fill a jug and 300 marbles to fill a bowl. Caitlyn used 100 bottle tops to fill the jug. How many bottle tops will she need to fill the bowl? Explain.

   200 bottle tops

Remember to have your resources ready.

Additional prompts and strategies

Support capacity activities regularly with practical experiences. These opportunities help children develop an intuitive sense of quantity and 'muchness', while encouraging them to reason about which container or resource is best suited to the task.

For this activity, ensure that you have enough containers prepared in advance. These containers should be different in shape and size but of similar capacity, as this highlights the limitations of measuring with non-standard units (cups). It is important for children to experience this 'discomfort' in order to appreciate the need for a standard unit.

Have children work in small groups, allowing them to compare their findings within their group and with others. The reflective discussion should start to reveal the need for a standardised convention/measuring unit to determine which container holds the most/least as the use of non-standard units is not accurate or efficient.

Activity 1:

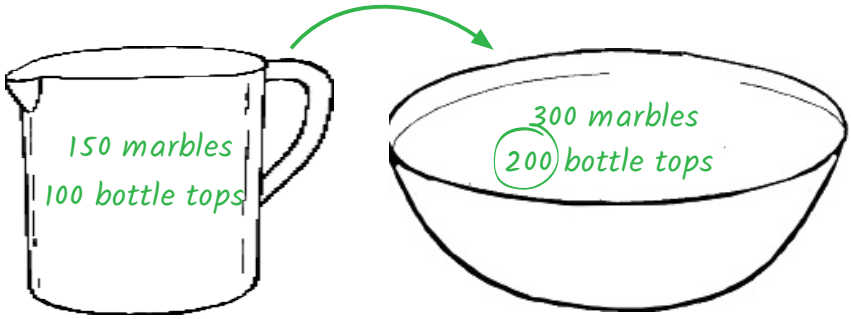
This activity results in similar findings to the practical activity, reinforcing the need for a standard unit with which to measure.

Activity 2:

double

Anticipated strategies might include:

I drew a picture to help me.



I noticed that the bowl holds double the amount of marbles that the jug holds. So I can double the number bottle tops in the jug to get the number of bottle tops for the bowl.

Jug		Bowl
150	→	300
(double)		
100	→	200