



Department of
Education

MATHEMATICS

Number and Capacity

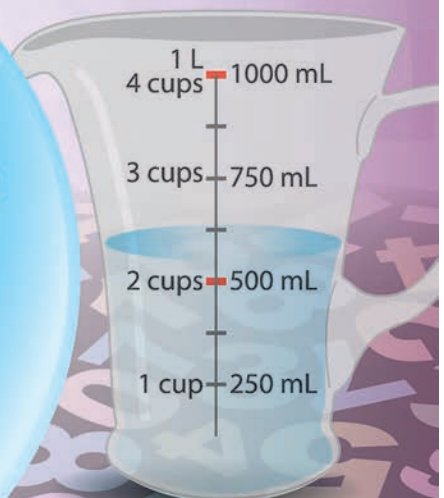
Early Childhood Year 3

Lesson Notes

MATHEMATICS

Set 7 – Lesson Notes

Number and Capacity



MATHS1877

Mathematics

Year 3

Set 7

Number and Capacity

Early Childhood

Lesson Notes

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Set 7

Number and Capacity

Introduction

Throughout this series, basic instructions have been included in each Activity Book. The Lesson Notes provide more detailed information and instructions for the tutor.

It is important for the tutor to:

- read the lesson notes for each day in advance
- have all of the equipment ready at the beginning of each lesson
- help the student with the organisation of materials
- read the instructions if the student has difficulty reading
- repeat the instructions if the student is unsure
- observe the student working and be on hand to discuss and teach where necessary
- check and mark activities as they are completed
- be aware that Day 5 and Day 10 activities will be marked by the teacher. The answers are provided only as a guide to how the student is going.
- participate in games and activities which require more than one person
- demonstrate where necessary
- provide positive feedback – for example: 'Well done! I like the way you show your thinking steps so clearly in this problem.'
- encourage care and neatness of work
- complete the 'Reflection' checklist at the end of Day 10 in the Activity Book.

Lesson structure

Each day should take about an hour to complete. Each day's lesson is divided into parts:



Going mental should take the student about 15 minutes to complete. *Going mental* is revision of what the student would be expected to know from previous books or previous years of schooling. These activities include:

- practice of basic number facts
- revision of measurement, chance and data, space and working mathematically skills.



Moving on is the body of the lesson where new material is introduced and activities are designed to consolidate the learning.



There are also *Stretching out* activities in some days. These are engaging, fun activities used to stimulate and challenge the mind.

What's in the Lesson Notes?

This resource provides you with various types of information:

- **Materials lists**

A list of equipment needed for each day is provided.

- **Background information**

These passages explain concepts, give definitions and provide tutoring tips.

- **Tutor instructions**



These are important and marked with this 'tutor' icon. They explain in detail what you need to do at particular points in a lesson. A 'Say' box tells you – in exact words – what to say to the student. Within a 'Say' box, you may come across brackets which contain answers the student should provide and/or hints.

The tutor icon is also used in the Activity Book – to inform the student that the tutor will say or do something at the points where it's shown.

- **Activity solutions**

Activity solutions are to be used to check, and if necessary correct, the student's work. It is important for students to get instant feedback. Please return the work marked.

Introduction**Number and Capacity****Materials**

The student may need to use materials to help them with the multiplication tasks to be completed during the first week.

- muffin tray
- egg carton

These materials are suitable for the grouping tasks.

- counters
- marbles
- dried beans, peas or chick peas
- matchsticks
- buttons
- pebbles
- large seeds such as sunflower or pumpkin
- beads
- dried pasta

The student will need to use different containers and bottles for capacity activities completed during the second week.

You will need to have these objects available for the lessons.

- measuring jug with at least 1 L capacity and 1 standard measuring cup (used for cooking)
- buckets to be filled with water or sand
- rice, flour or sugar to use instead of water for pouring/packing activities
- different-sized bowls – soup, mixing, large salad
- yoghurt tubs
- ice-cream containers
- ladles
- empty cans, jars and their lids
- different-sized food storage containers
- different-sized spoons
- different-sized cups, glasses and mugs
- empty water bottles, including 1 L and 2 L bottles

Number and Capacity

Introduction

Day 1**Number and Capacity****Day 1****Materials**

- paper to practise multiplication work
- coloured pencils
- materials for grouping (counters, marbles, matchsticks, 2 cm cubes, MAB units, buttons, dried beans, straws etc)

**Going mental****Tutor instructions**

Ask the student to give an explanation for their choice of answer.

This will help you to see whether they understand place value.

- 438 is the right answer because 548 is 10 more and 638 is 100 more.
- 1 090 is the right answer because 1 290 is 100 more and 2 190 is 1 000 more.
- 2 246 is the right answer because 3 346 is 1 000 more and 2 446 is 100 more.
- 4 899 is the right answer because 5 000 is 1 more and 5 009 is 10 more.
- 2 966 is the right answer because 3 166 is 100 more and 3 006 is 60 less.

Activity solutions**1. 100 less**

Circle the number that is 100 less than the number in the first column. An example has been included.

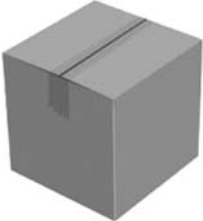
	3 245	3 235	3 145	2 245
a)	538	548	438	638
b)	1 190	1 090	1 290	2 190
c)	2 346	3 346	2 446	2 246
d)	4 999	5 000	4 899	5 009
e)	3 066	2 966	3 166	3 006

Number and Capacity

Day 1

2. Flat and curved surfaces

Count the number of flat and curved surfaces in each image and fill in the boxes with the right answer.

	Flat surface(s)	1
	Curved surface(s)	1
	Flat surface(s)	2
	Curved surface(s)	1
	Flat surface(s)	1
	Curved surface(s)	1
	Flat surface(s)	0
	Curved surface(s)	1
	Flat surface(s)	6
	Curved surface(s)	0

Day 1**Number and Capacity****3. Make a dozen**

List all the possible combinations of red and blue eggs that could have 12 as their total.

red		blue		
6	+	6	=	12
12	+	0	=	12
11	+	1	=	12
10	+	2	=	12
9	+	3	=	12
8	+	4	=	12
7	+	5	=	12

red		blue		
6	+	6	=	12
0	+	12	=	12
1	+	11	=	12
2	+	10	=	12
3	+	9	=	12
4	+	8	=	12
5	+	7	=	12

**Moving on****Activity 1: Understanding multiplication****Background information**

The symbol x is used to show multiplication.

You can use lots of words to describe multiplication in place of the X symbol.

Here are five groups and each group has two buttons.

(Count out the groups of buttons – 1, 2, 3, 4, 5)



Number and Capacity

Day 1

This can be written as:

- five **groups** of two
- five **lots** of two
- five **sets** of two
- five **times** two
- two **multiplied by** five
- the **product** of five and two
- five **twos**

The X symbol replaces the words: 'groups of', 'lots of', 'sets of', 'times', 'multiplied by' and 'product of'.



Tutor Instructions

Choose 15 cubes, matchsticks, marbles, buttons, counters etc.

Ask the student to place the 15 items into 3 groups, with 5 items in each group on the workspace in front of them.

Ask the student:

- How many groups are there? (3)
- How many objects are in each group? (5)
- How would you describe this collection? (3 groups of 5, 3 lots of 5, 3 times 5, 3×5 etc)
- How many objects are there altogether? (15)

It is important that the student states that there are 3 groups of 5 and not 5 groups of 3.

If the student understands this idea, move on to the activities.

If the student needs further practice, they should set out:

- 4 groups with six objects in each group (4 lots of 6)
- 2 groups with 7 objects in each group (2 sets of 7)
- 5 groups with 5 objects in each group (5 groups of 5)

Day 1

Number and Capacity

Activity solutions

1.1 Describing multiplication

Draw a line to match the multiplication description to the image.

3 sets of 5

6 lots of 4

4 x 6

5 groups of 3

3 sixes



Tutor instructions

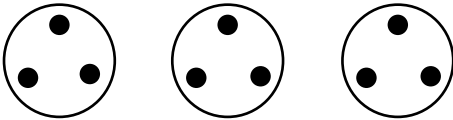
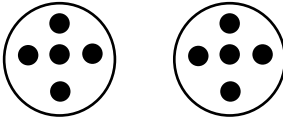
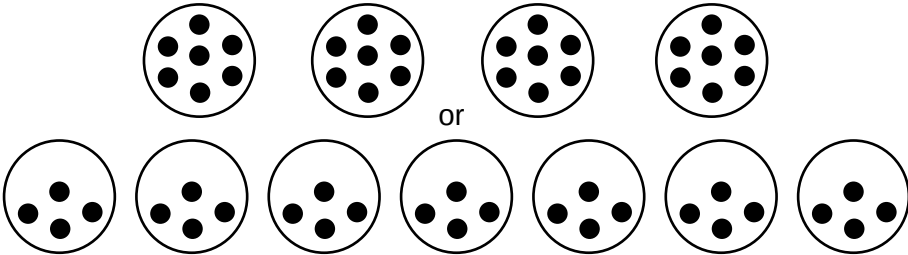
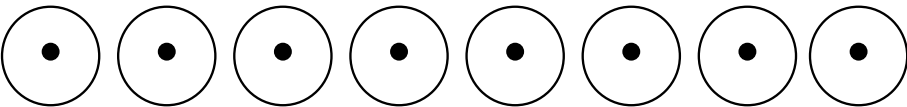
It is important that the student understands the difference between the number of groups and number of objects in each group.

Take time to revise these two concepts if the student has made errors.

Look back at the examples at the start of Activity 1 for ideas.

Activity solutions

1.2 Draw the descriptions

3 sets of 3	
2 groups of 5	
Multiply 4 and 7	 This multiplication doesn't specify how many 'lots of' or how many in each group so either answer is correct.
8 lots of 1	

Say

Multiplication is used whenever a number is added again and again. This is also called repeated addition.

The example in the Activity Book shows there are five groups. Each group has three gingerbread men.

This is the same as saying $3 + 3 + 3 + 3 + 3$ or adding 3, five times.

Using repeated addition is a long way of solving a multiplication problem but you get to the same answer using both operations.

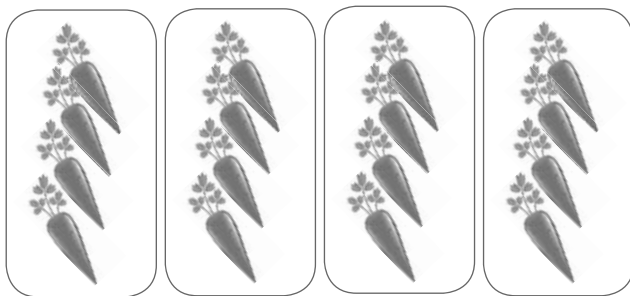
Day 1

Number and Capacity

Activity solutions

1.3 Groups of the same size

a)

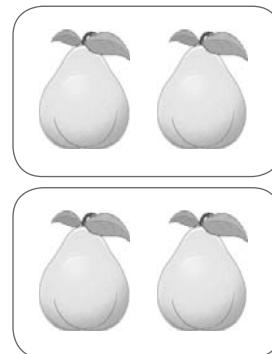


4 groups, 4 carrots in each

$$4 \times 4 \text{ carrots} = 16 \text{ carrots}$$

$$4 + 4 + 4 + 4 = 16$$

b)

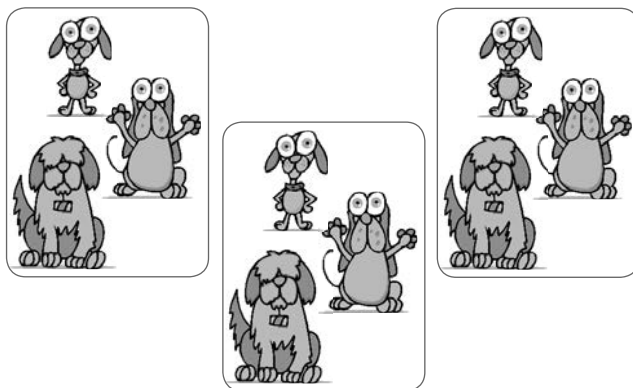


2 groups, 2 pears in each

$$2 \times 2 \text{ pears} = 4 \text{ pears}$$

$$2 + 2 = 4$$

c)

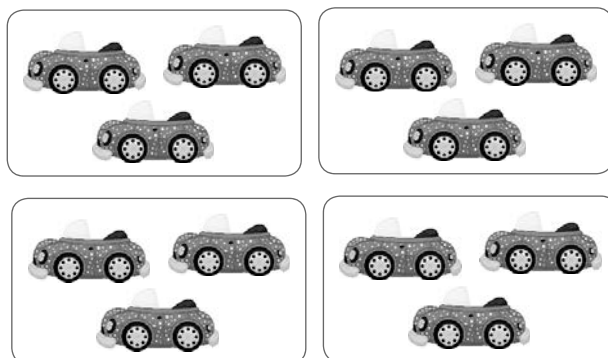


3 groups, 3 dogs in each

$$3 \times 3 \text{ dogs} = 9 \text{ dogs}$$

$$3 + 3 + 3 = 9$$

d)



4 groups, 3 cars in each

$$4 \times 3 \text{ cars} = 12 \text{ cars}$$

$$3 + 3 + 3 + 3 = 12$$

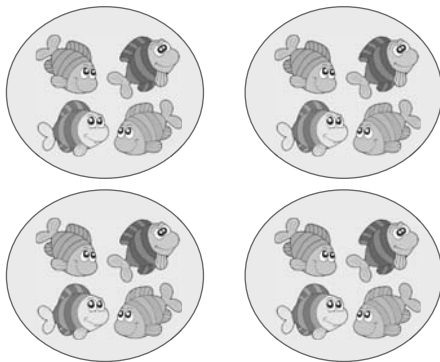
Activity 2: Repeated addition

Activity solutions

2.1 Addition and multiplication sentences

Write a multiplication and addition sentence for each picture.

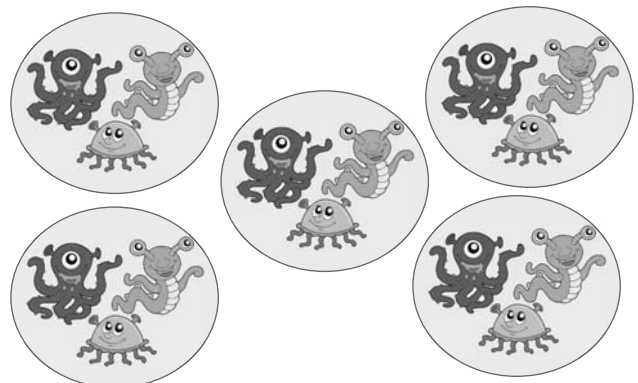
a)



$$4 \times 4 = 16$$

$$4 + 4 + 4 + 4 = 16$$

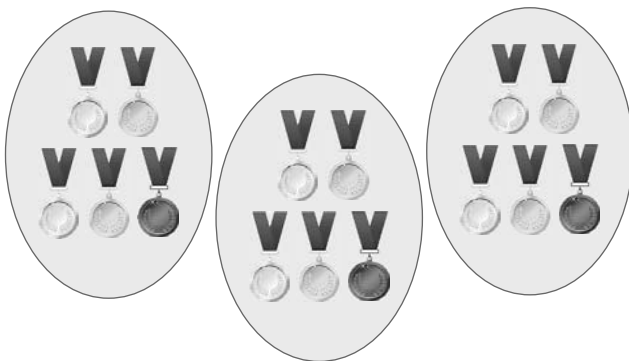
b)



$$5 \times 3 = 15$$

$$3 + 3 + 3 + 3 + 3 = 15$$

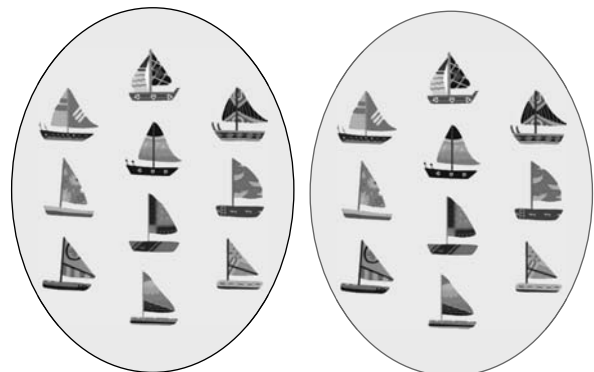
c)



$$3 \times 5 = 15$$

$$5 + 5 + 5 = 15$$

d)



$$2 \times 10 = 20$$

$$10 + 10 = 20$$

Day 1

Number and Capacity

2.2 Multiply by adding

a)	$10 + 10 + 10 + 10 + 10 + 10 + 10$	7×10
b)	$4 + 4 + 4$	3×4
c)	$2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$	10×2
d)	$3 + 3 + 3 + 3 + 3$	5×3
e)	$5 + 5 + 5 + 5 + 5 + 5 + 5$	7×5

Background information

Number lines can help students learn their multiplication tables.

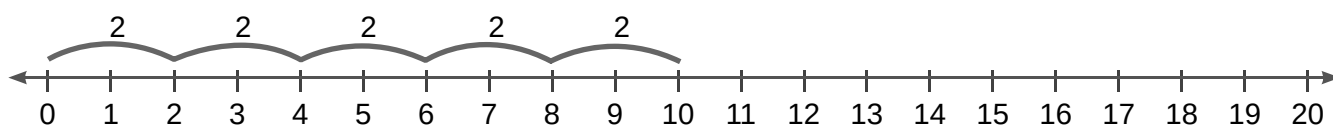
Multiplication is the same as skip counting. When you skip count by a number, you are saying the answers to that number's times tables.

Read through the next section with the student.



Tutor instructions

Look at this number line.



There are five jumps. Each jump is two.

$$2 + 2 + 2 + 2 + 2$$

When you skip count by 2s you say, 2, 4, 6, 8, 10.

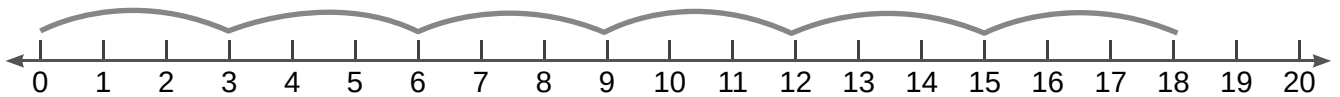
Five jumps of 2 on the number line reach 10 as a total.

The multiplication sentence is $5 \times 2 = 10$.

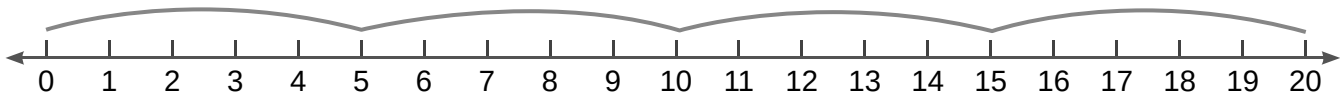
Activity solutions

2.3 Skip counting

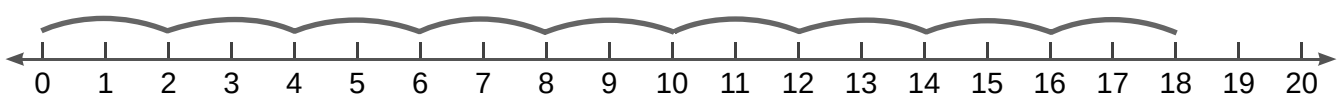
a)

Addition sentence: $3 + 3 + 3 + 3 + 3 + 3$ Multiplication sentence: 6×3 Answer = 18

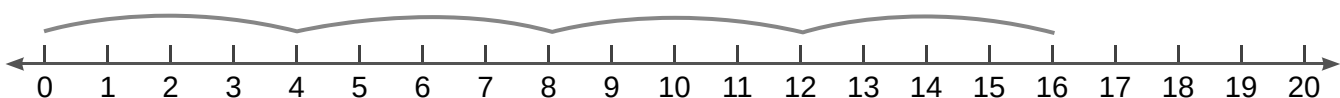
b)

Addition sentence: $5 + 5 + 5 + 5$ Multiplication sentence: 4×5 Answer = 20

c)

Addition sentence: $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$ Multiplication sentence: 9×2 Answer = 18

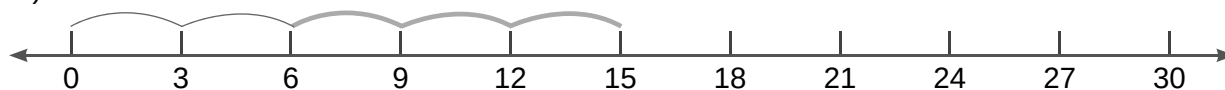
d)

Addition sentence: $4 + 4 + 4 + 4$ Multiplication sentence: 4×4 Answer = 16

Day 1**Number and Capacity****2.4 Continue the jumps**

Continue to draw the jumps to fit the addition and multiplication problem.

a)



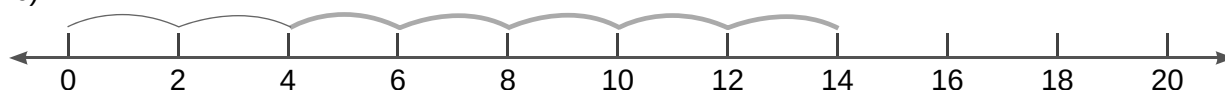
Addition sentence: $3 + 3 + 3 + 3 + 3$

Multiplication sentence: 5×3

Answer = 15

So the multiples of 3 are 3, 6, 9, 12, 15

b)



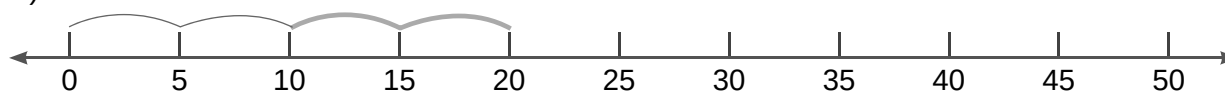
Addition sentence: $2 + 2 + 2 + 2 + 2 + 2 + 2$

Multiplication sentence: 7×2

Answer = 14

So the multiples of 2 are 2, 4, 6, 8, 10, 12, 14

c)



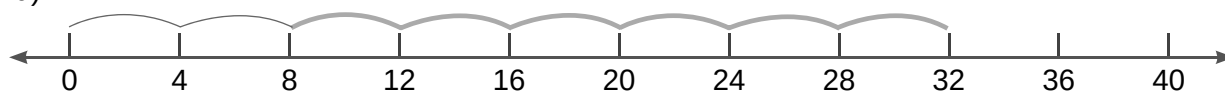
Addition sentence: $5 + 5 + 5 + 5$

Multiplication sentence: 4×5

Answer = 20

So the multiples of 5 are 5, 10, 15, 20

d)



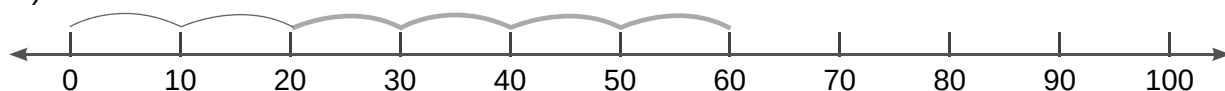
Addition sentence: $4 + 4 + 4 + 4 + 4 + 4 + 4 + 4$

Multiplication sentence: 8×4

Answer = 32

So the multiples of 4 are 4, 8, 12, 16, 20, 24, 28, 32

e)



Addition sentence: $10 + 10 + 10 + 10 + 10 + 10$

Multiplication sentence: 6×10

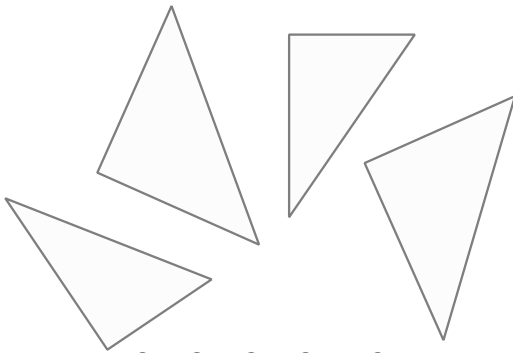
Answer = 60

So the multiples of 10 are 10, 20, 30, 40, 50, 60

Activity 3: Multiples of three

3.1 How many corners?

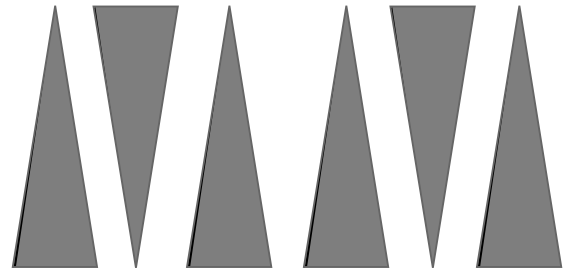
a)



$$3 + 3 + 3 + 3 = 12$$

$$4 \times 3 = 12$$

b)



$$3 + 3 + 3 + 3 + 3 + 3 = 18$$

$$6 \times 3 = 18$$

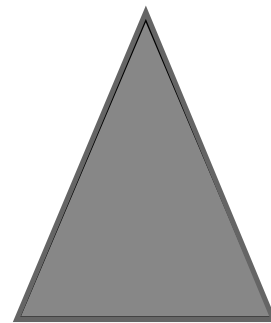
c)



$$3 + 3 + 3 + 3 + 3 = 15$$

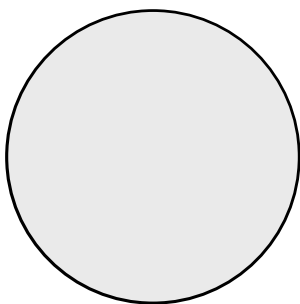
$$5 \times 3 = 15$$

d)



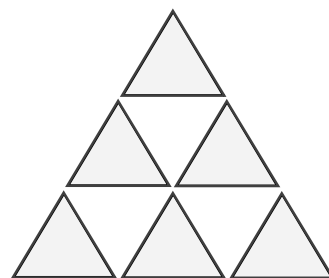
$$1 \times 3 = 3$$

e)



$$0 \times 3 = 0$$

f)



$$6 \times 3 = 18$$

Say

When a number is multiplied by 0, as in question e), the answer is always 0.

Day 1

Number and Capacity

3.2 Skip count



Tutor instructions

Ask the student to count aloud as they skip count in threes (**3, 6, 9, 12, 15, 18, 21, 24, 27, 30**). Remind them that the numbers they say aloud are the multiples of three.

Remind them to place a circle around the numbers they land on.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

The multiples of 3 are:

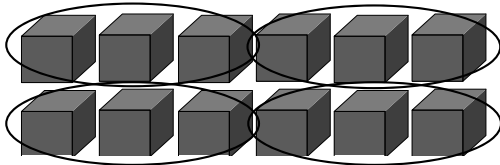
a)	0	3	6	9	12	15
b)	9	12	15	18	21	24
c)	12	15	18	21	24	27
d)	15	18	21	24	27	30
e)	27	24	21	18	15	12

3.3 Groups of three

Activity solutions

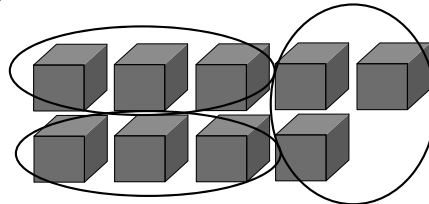
Circle the cubes in groups of three. Finish the multiplication fact.

a)



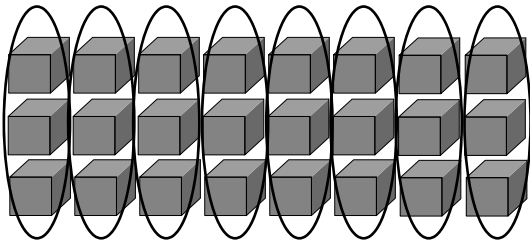
$$4 \times 3 = 12$$

b)



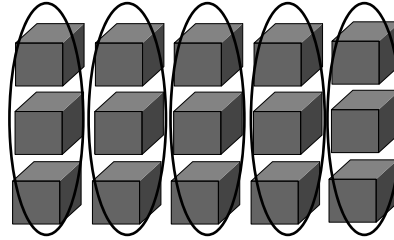
$$3 \times 3 = 9$$

c)



$$8 \times 3 = 24$$

d)



$$5 \times 3 = 15$$



Stretching out



Tutor instructions

Ask the student to explain how they will solve the problem and mark in the Activity Book whether they have explained their thinking clearly or with some problems.

The student may solve this problem in five steps. These steps have been mapped out here as questions.

The student may use a different method to solve the problem.

Day 1

Number and Capacity

Say

What do we need to do first? (Find the total number of cubes.)

Explain to me how you will find the total number? (The student can use mental strategies, written methods, tallying, or counting out materials to find the total.)

Give the student time to work out the total number.

The total number of cubes is 60.

Now that you know the total number of cubes, what do you need to do next? (Find how many groups of three can be made from the cubes.)

How will you do this? (The student should suggest manually putting the cubes into groups of three.)

Give the student time to sort the cubes into groups.

There will be 20 groups of three in total.

Now that you know the number of groups, what will you do next? (Write a number sentence to show that 20 groups of three equals 60.)

The answer to the 'Stretching out' problem is: $20 \times 3 = 60$.

**Tutor instructions**

Check the box in the Activity Book to state whether the student has explained their thinking clearly.

Number and Capacity

Day 1

Day 2**Number and Capacity****Day 2****Materials**

- muffin or cupcake tray (12 holes)
- materials for grouping (counters, marbles, matchsticks, 2 cm cubes, MAB units, buttons, dried beans, straws etc)

**Going mental****1. Words**

Write the numbers for these words.

- | | |
|--------------------------------|---|
| a) ninety-six – 96 | d) one thousand, five hundred and seven – 1 507 |
| b) seventy-three – 73 | e) four thousand, two hundred and one – 4 201 |
| c) two hundred and seven – 207 | f) nine thousand and twelve – 9 012 |

2. What's the time?

Rule lines to match each clock to its time.

The diagram shows the following connections:

- Top-left analog clock (9:45) connects to "a quarter to 3".
- Middle-left digital clock (2:45 AM) connects to "half past nine".
- Bottom-left analog clock (10:15) connects to "a quarter past 10".
- Top-right digital clock (10:15 AM) connects to "8 o'clock".
- Middle-right analog clock (3:45) connects to "5:15".
- Bottom-right digital clock (8:00 AM) connects to "3:45".

Number and Capacity

Day 2

3. Fractions

a) Alice cut four apples into halves.

☐ four halves

☒ eight halves

☐ five halves

☐ six halves

b) Mia cut three pears into quarters.

☐ 4 quarters

☐ 8 quarters

☐ $\frac{3}{4}$

☒ 12 quarters



Moving on

Activity 1: It's all multiplication

Activity solutions

1.1 Match up

Use different-coloured pencils to match up the addition and multiplication facts. One example has been done for you.

$4 + 4 + 4 + 4$	three groups of ten	2×5	30
$2 + 2 + 2 + 2 + 2$	two fives	3×10	24
$5 + 5$	4 bundles of 4	4×4	10
$3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$	5 times 2	5×2	16
$10 + 10 + 10$	eight sets of three	8×3	10

Day 2

Number and Capacity

1.2 Groups of the same size

Draw groups to show the multiplication problem and write an addition sentence to match.

a)

$3 \times 5 = 15$
Addition sentence:
 $5 + 5 + 5 = 15$

b)

$7 \times 2 = 14$
Addition sentence:
 $2 + 2 + 2 + 2 + 2 + 2 + 2 = 14$



Tutor instructions

Say

Look at the arrays in your Activity Book.

We use arrays to show objects or amounts in equal rows.

Each row has the same amount and each column has the same amount.

Arrays are always made in rectangular shapes.

In Nelly's example array, how many rows are there? (4)

The rows tell you the number of groups or 'lots of'.

How many columns are there? (3)

The columns tell you how many in the group.

What would the number sentence for this array be? (4 lots of 3 or 4×3)

Number and Capacity

Day 2**Say**

Look at the other example arrays, which all show a total of 12.

Ask the same questions:

How many rows are there?

How many columns are there?

Can you see how this matches the number sentence written under the array?
(The number sentence shows the number of rows multiplied by the number in each column)



Tutor instructions

Ask the student to use materials (counters, MAB units) to make an array showing 5 lots of 6.

Check that the student has made a rectangular array with 5 rows and 6 counters in each row.

It is important that the student understands that each row in an array is equal in length.

Continue to read the information about factors with the student.

Look at the factor wheel for the number 12.

Lead the student to see that the factor wheel shows the same information as the arrays but without the columns and rows. They should see that when you multiply opposite numbers on the wheel you get an answer of 12. The number sentences match those from the arrays activity.

Ask the student if they can see the relationship between the number of arrays possible for 12 and the factors of 12. The student should see that there are 6 possible arrays for 12 and there are 6 answers.



Tutor instructions

Check that the student has the correct number of rows and items in each row for Activities 2.1 and 2.2.

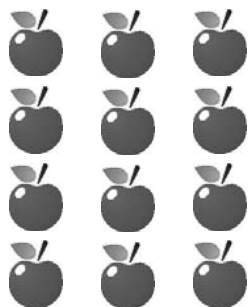
Day 2

Number and Capacity

Activity 2: Arrays

2.1 Counting fruit

a)

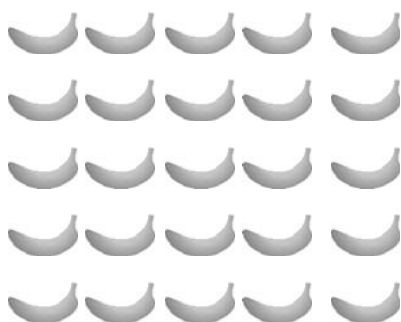


4 rows with 3 apples in each row.

$$4 \times 3 = 12$$

$$3 + 3 + 3 + 3 = 12$$

b)



5 rows with 5 bananas in each row.

$$5 \times 5 = 25$$

$$5 + 5 + 5 + 5 + 5 = 25$$

c)

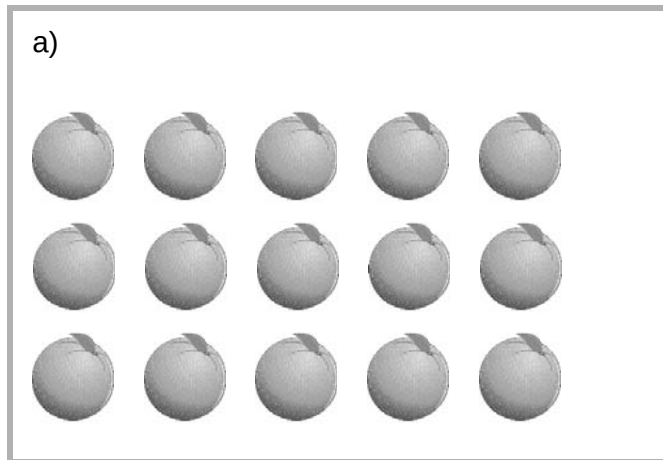


2 rows with 4 melons in each row.

$$2 \times 4 = 8$$

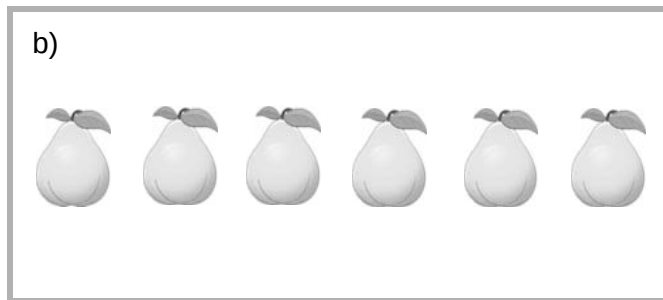
$$4 + 4 = 8$$

2.2 Drawing fruit arrays



3 rows with 5 oranges in each row.

$$3 \times 5 = 15$$



1 row with 6 pears in each row.

$$1 \times 6 = 6$$

Activity 3: Different arrangements

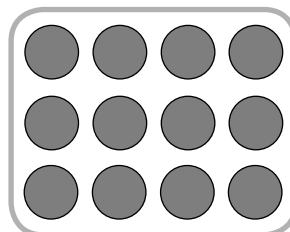


Tutor instructions

An array can be drawn in two different arrangements and still total the same amount.

Use a muffin or cupcake tray as an example.

Place the tray in front of the student in this arrangement.



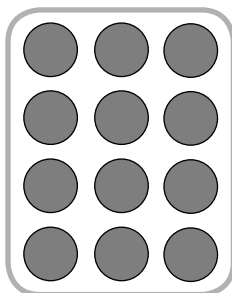
Ask the student how many rows and columns there are. (3 rows, 4 columns)

Ask the student how many spaces are in the tin. (12)

Ask the student how this would be represented as a number sentence.
(3 lots of 4 or $3 \times 4 = 12$)

Day 2**Number and Capacity**

Take the muffin or cupcake tray and rotate it.



The tray is exactly the same, only arranged differently.

Ask the student how many rows and columns there are now. (4 rows, 3 columns)

Ask the student how many spaces are in the tin. (12)

Ask the student how this would be represented as a number sentence.

(4 lots of 3 or $4 \times 3 = 12$)

Look at Mark and Nelly's examples of the two arrays in the Activity Book.

You can demonstrate this concept using an egg carton.

Use the egg carton to show the student that there are a total of 12 egg spaces.

Explain to the student that if the carton is placed horizontally, the array would be:

2 lots of 6 or $2 \times 6 = 12$.

Flip the egg carton vertically.

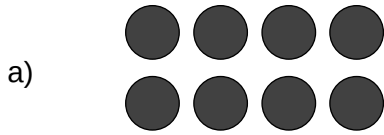
Explain to the student that if the carton is placed vertically, the array would be:

6 lots of 2 or $6 \times 2 = 12$.



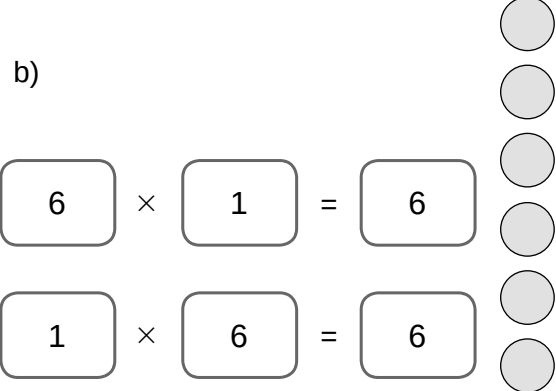
3.1 Different multiplication sentences

Activity solutions



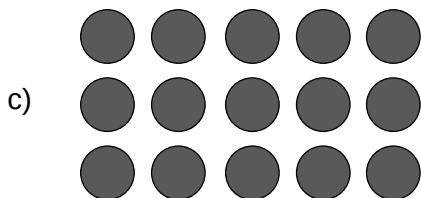
$$\boxed{2} \times \boxed{4} = \boxed{8}$$

$$\boxed{4} \times \boxed{2} = \boxed{8}$$



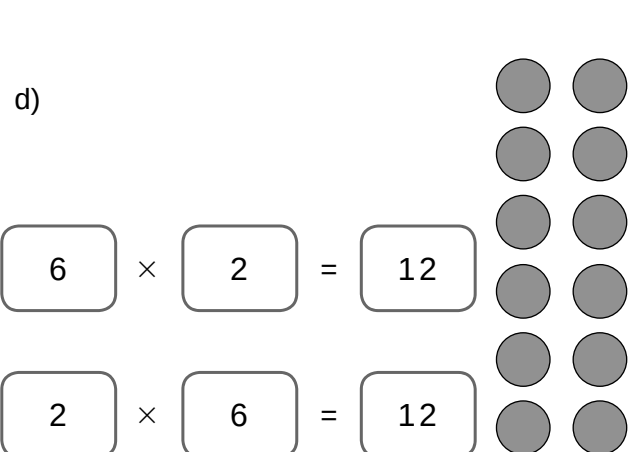
$$\boxed{6} \times \boxed{1} = \boxed{6}$$

$$\boxed{1} \times \boxed{6} = \boxed{6}$$



$$\boxed{3} \times \boxed{5} = \boxed{15}$$

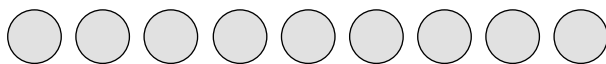
$$\boxed{5} \times \boxed{3} = \boxed{15}$$



$$\boxed{6} \times \boxed{2} = \boxed{12}$$

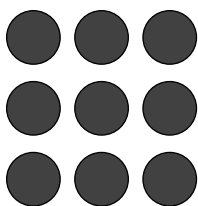
$$\boxed{2} \times \boxed{6} = \boxed{12}$$

3.2 Find the different arrays

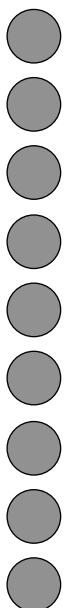


$$\boxed{1} \times \boxed{9} = \boxed{9}$$

$$\boxed{9} \times \boxed{1} = \boxed{9}$$



$$\boxed{3} \times \boxed{3} = \boxed{9}$$

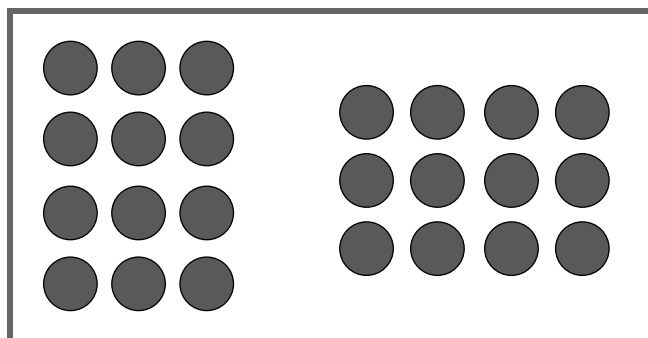


Day 2**Number and Capacity****3.3 Make your own arrays**

Use counters or other materials to make arrays to match the multiplication sentences. Draw the arrays in the space provided.

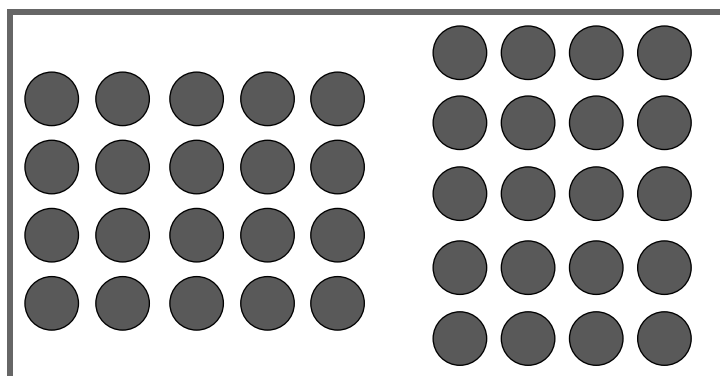
a) $\boxed{4} \times \boxed{3} = \boxed{12}$

$\boxed{3} \times \boxed{4} = \boxed{12}$



b) $\boxed{4} \times \boxed{5} = \boxed{20}$

$\boxed{5} \times \boxed{4} = \boxed{20}$

**Background information**

The student should be encouraged to practise multiplication number facts as often as possible because this helps to memorise the facts and make recall of them automatic.

Tables can be practised as: one three is three, two threes are six, four threes are twelve but it is much better for the student to know their facts from memory.

Activity 4: Multiples of three

Activity solutions

4.1 Bunches of three

- | | | | |
|--------------|---------------------------|---------------|----------------------------|
| a) 1 bunch | $1 \times 3 = 3$ bananas | b) 2 bunches | $2 \times 3 = 6$ bananas |
| c) 3 bunches | $3 \times 3 = 9$ bananas | d) 4 bunches | $4 \times 3 = 12$ bananas |
| e) 5 bunches | $5 \times 3 = 15$ bananas | f) 6 bunches | $6 \times 3 = 18$ bananas |
| g) 7 bunches | $7 \times 3 = 21$ bananas | h) 8 bunches | $8 \times 3 = 24$ bananas |
| i) 9 bunches | $9 \times 3 = 27$ bananas | j) 10 bunches | $10 \times 3 = 30$ bananas |

4.2 Three times facts

- | | | |
|----------------------|----------------------|----------------------|
| a) $3 \times 3 = 9$ | b) $4 \times 3 = 12$ | c) $0 \times 3 = 0$ |
| d) $6 \times 3 = 18$ | e) $9 \times 3 = 27$ | f) $8 \times 3 = 24$ |
| g) $1 \times 3 = 3$ | h) $2 \times 3 = 6$ | i) $7 \times 3 = 21$ |

4.3 Picture stories



Tutor instructions

When solving word problems, it is important that the student reads the question carefully.

Work through question a) with the student.

Say

In mathematics, we write the things we say using numerals and symbols so it can often help to underline or circle the important facts.

The first question:

There are five spaceships. Each spaceship has three legs. How many legs altogether?

Look at what you know – 5 spaceships, 3 legs each. How many legs?

This is like saying 5 lots of 3 legs = how many legs? or $5 \times 3 =$?

$5 \times 3 = 15$.

Day 2

Number and Capacity



Tutor instructions

Allow the student to circle or underline the 'mathematics' in each problem and to use materials if necessary to help solve the problem.

Activity solutions

a)

There are five spaceships.
Each spaceship has three legs
How many legs altogether?

$$5 \times 3 = 15$$

There are 15 legs on 5
spaceships.

b)

Seven tricycles each have
three wheels. How many
wheels are there in total?

$$7 \times 3 = 21$$

There are 21 wheels on
7 tricycles.

c)

One ticket costs \$3. How much
does it cost for 6 tickets?

$$6 \times \$3 = \$18$$

Six tickets would cost
a total of \$18.

d)

One teapot makes three cups
of tea. How many cups of tea
will four teapots make?

$$4 \times 3 = 12$$

Four teapots will make
12 cups of tea.



Stretching out

Weave your way home

Activity solutions

		3	6	11	7	14	4	19	13	5
	4	13	30	25	30	24	21	25	16	
37	26	18	20	15	8	28	30	29	46	
	5	27	20	21	16	32	22	27	43	
14	30	37	18	14	3	9	18	19	34	
	3	23	6	2	15	41	17	32	14	
23	15	12	4	17	6	24	21	27		

Day 3**Number and Capacity****Day 3****Materials**

- materials for grouping (counters, marbles, matchsticks, 2 cm cubes, MAB units, buttons, dried beans, straws etc)

**Going mental****1. Complete the patterns****Tutor instructions**

Ask the student to describe the pattern in each activity.

- a) increases by 5 (+ 5)
- b) increases by 2 (+ 2)
- c) increases by 10 (+10)
- d) increases by 4 (+ 4)
- e) decreases by 10 (– 10)

Activity solutions

a)	5	10	15	20	25	30	35	40	45	50
----	---	----	----	----	----	----	----	----	----	----

b)	32	34	36	38	40	42	44	46	48	50
----	----	----	----	----	----	----	----	----	----	----

c)	40	50	60	70	80	90	100	110	120	130
----	----	----	----	----	----	----	-----	-----	-----	-----

d)	4	8	12	16	20	24	28	32	36	40
----	---	---	----	----	----	----	----	----	----	----

e)	100	90	80	70	60	50	40	30	20	10
----	-----	----	----	----	----	----	----	----	----	----

2. It's a goal!

Goals scored by teams	
A	   
B	  
C	
D	  
E	 

Key	
	= 2 goals

- a) How many goals were scored by team A? 8 goals
- b) How many goals were scored by team E? 4 goals
- c) How many more goals did team A score than team C? 6 goals
- d) Which team scored the least number of goals?
How many goals did they score? Team C – they scored 2 goals.
- e) How many goals did teams B and D score together? 12 goals
- f) How many goals were scored altogether during the carnival? 26 goals

3. Which is longer?

Circle the longer time in each pair.

a)	<u>1 month</u>	1 week
c)	<u>80 seconds</u>	1 minute
e)	<u>5 weeks</u>	1 month
g)	1 fortnight	<u>1 month</u>
i)	<u>1 season</u>	10 weeks

b)	<u>1 day</u>	12 hours
d)	<u>9 days</u>	1 week
f)	30 minutes	<u>1 hour</u>
h)	1 week	<u>1 fortnight</u>
j)	<u>March</u>	April

Day 3

Number and Capacity



Moving on

Activity 1: Order doesn't matter



Tutor instructions

Look at the number line example that shows that a multiplication problem can be done in two different ways.

Point out the purple skips on the number line to the student. Each skip is 2.

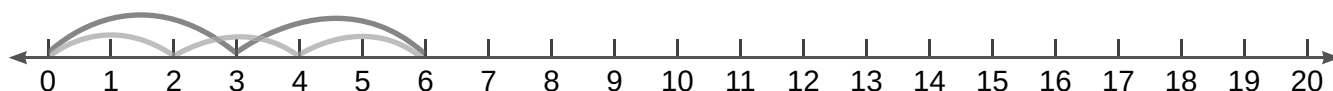
Ask the student how many green skips were taken to reach 6. (3 – You would count them 2, 4, 6.)

Explain to the student that this means that $3 \times 2 = 6$.

Point out the red skips on the number line to the student. Each skip is 3.

Ask the student how many red skips were taken to reach 6. (2 – You would count them 3, 6.)

Explain to the student that this means that $2 \times 3 = 6$.



$$\boxed{3} \times \boxed{2} = \boxed{6} \quad \text{and} \quad \boxed{2} \times \boxed{3} = \boxed{6}$$

Say

All multiplication number facts can be reversed.

Even when they are reversed, they still give the same answer because the two numbers are factors of the total.

Look at 3×2 and 2×3 . They both equal 6.

Two and 3 are factors of 6 so both multiplication facts give the same total.

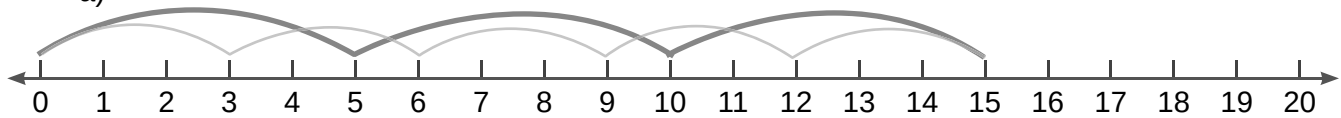
Every multiplication number fact has a reverse or turn around fact. When you learn one multiplication fact, you have really learnt two!

Activity solutions

1.1 Write the number sentences

The number lines show two ways of skip counting. Write the two multiplication sentences.

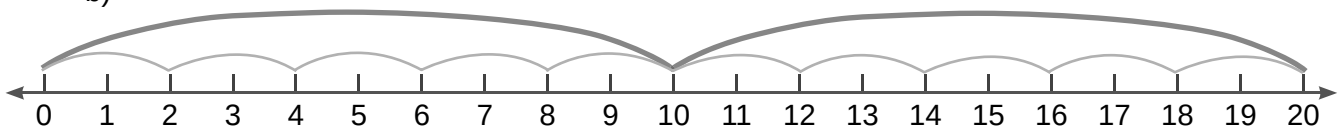
a)



$$\boxed{5} \times \boxed{3} = \boxed{15} \quad \text{and} \quad \boxed{3} \times \boxed{5} = \boxed{15}$$

So two factors of 15 are 3 and 5.

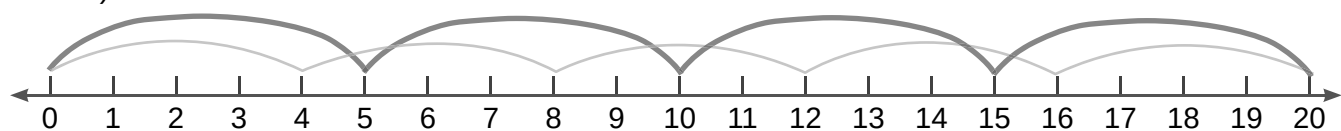
b)



$$\boxed{10} \times \boxed{2} = \boxed{20} \quad \text{and} \quad \boxed{2} \times \boxed{10} = \boxed{20}$$

So two factors of 20 are 2 and 10.

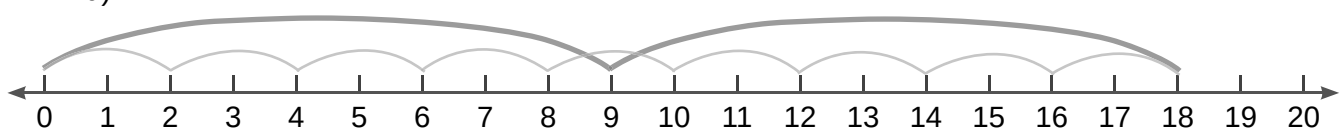
c)



$$\boxed{5} \times \boxed{4} = \boxed{20} \quad \text{and} \quad \boxed{4} \times \boxed{5} = \boxed{20}$$

So another two factors of 20 are 4 and 5.

d)



$$\boxed{9} \times \boxed{2} = \boxed{18} \quad \text{and} \quad \boxed{2} \times \boxed{9} = \boxed{18}$$

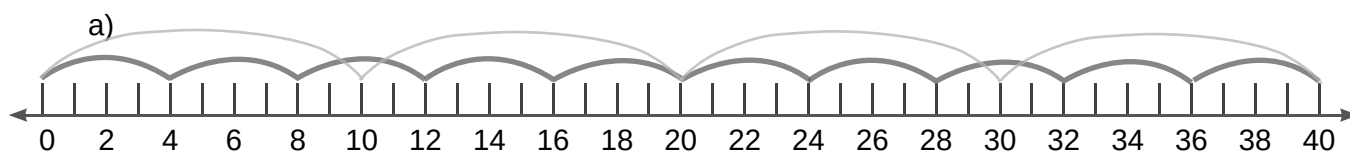
So two factors of 18 are 2 and 9.

Two other factors of 18 are 1 and 18 or 3 and 6.

Day 3

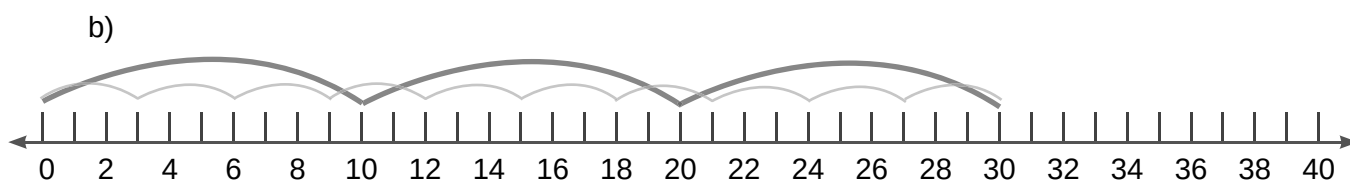
Number and Capacity

1.2 Adding steps



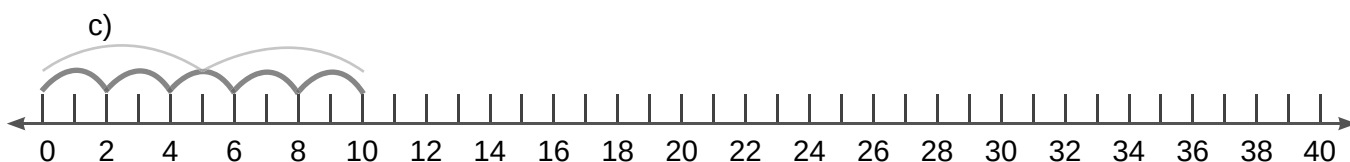
$$\boxed{10} \times \boxed{4} = \boxed{40} \quad \text{and} \quad \boxed{4} \times \boxed{10} = \boxed{40}$$

Two factors of 40 are 4 and 10.



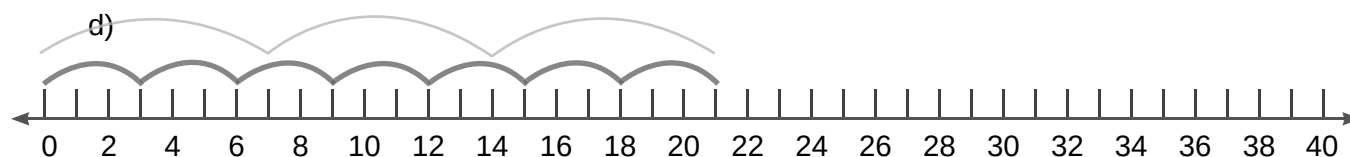
$$\boxed{3} \times \boxed{10} = \boxed{30} \quad \text{and} \quad \boxed{10} \times \boxed{3} = \boxed{30}$$

Two factors of 30 are 3 and 10.



$$\boxed{5} \times \boxed{2} = \boxed{10} \quad \text{and} \quad \boxed{2} \times \boxed{5} = \boxed{10}$$

Two factors of 10 are 2 and 5.



$$\boxed{7} \times \boxed{3} = \boxed{21} \quad \text{and} \quad \boxed{3} \times \boxed{7} = \boxed{21}$$

Two factors of 21 are 3 and 7.

1.3 Use a calculator

	Number sentence	Answer	Number sentence	Answer	Tick if both answers are the same
a)	$8 \times 2 =$	16	$2 \times 8 =$	16	✓
b)	$7 \times 4 =$	28	$4 \times 7 =$	28	✓
c)	$9 \times 3 =$	27	$3 \times 9 =$	27	✓
d)	$6 \times 5 =$	30	$5 \times 6 =$	30	✓
e)	$2 \times 10 =$	20	$10 \times 2 =$	20	✓

1.4 Turn around facts

a) $5 \times 9 =$	$9 \times 5 =$	45	b) $2 \times 6 =$	$6 \times 2 =$	12
c) $2 \times 8 =$	$8 \times 2 =$	16	d) $4 \times 9 =$	$9 \times 4 =$	36
e) $4 \times 7 =$	$7 \times 4 =$	28	f) $5 \times 7 =$	$7 \times 5 =$	35
g) $10 \times 6 =$	$6 \times 10 =$	60	h) $3 \times 8 =$	$8 \times 3 =$	24

Activity 2: Arranging collections

Background information

The two tasks using arrays should help to strengthen the student's understanding that collections can be arranged in different, equal-sized groups as arrays and that the numbers of the array equate to the factors of that total.

The example in the Activity Book shows the different ways that a collection of 12 can be arranged: 1×12 ; 12×1 ; 3×4 ; 4×3 ; 2×6 and 6×2 .

So, each of the numbers 1, 2, 3, 4, 6 and 12 are known as the factors of 12.

Factors are whole numbers that, when multiplied with another whole number, make a third number. The student should be introduced to the word 'factor' but they may not be ready to use this term for themselves.

Say

You were introduced to arrays in Day 2.

Let's revise the information about arrays.

Arrays are arranged in rows and columns.

Look at the arrays in your Activity Book that show how a collection of 12 can be arranged.

Each array has a reverse or matching array.

There is an array to show 1×12 and a matching array that shows 12×1 .

Find the other pairs of matching arrays.

(3×4 and 4×3) and (2×6 and 6×2)

Remember that every multiplication can be reversed.

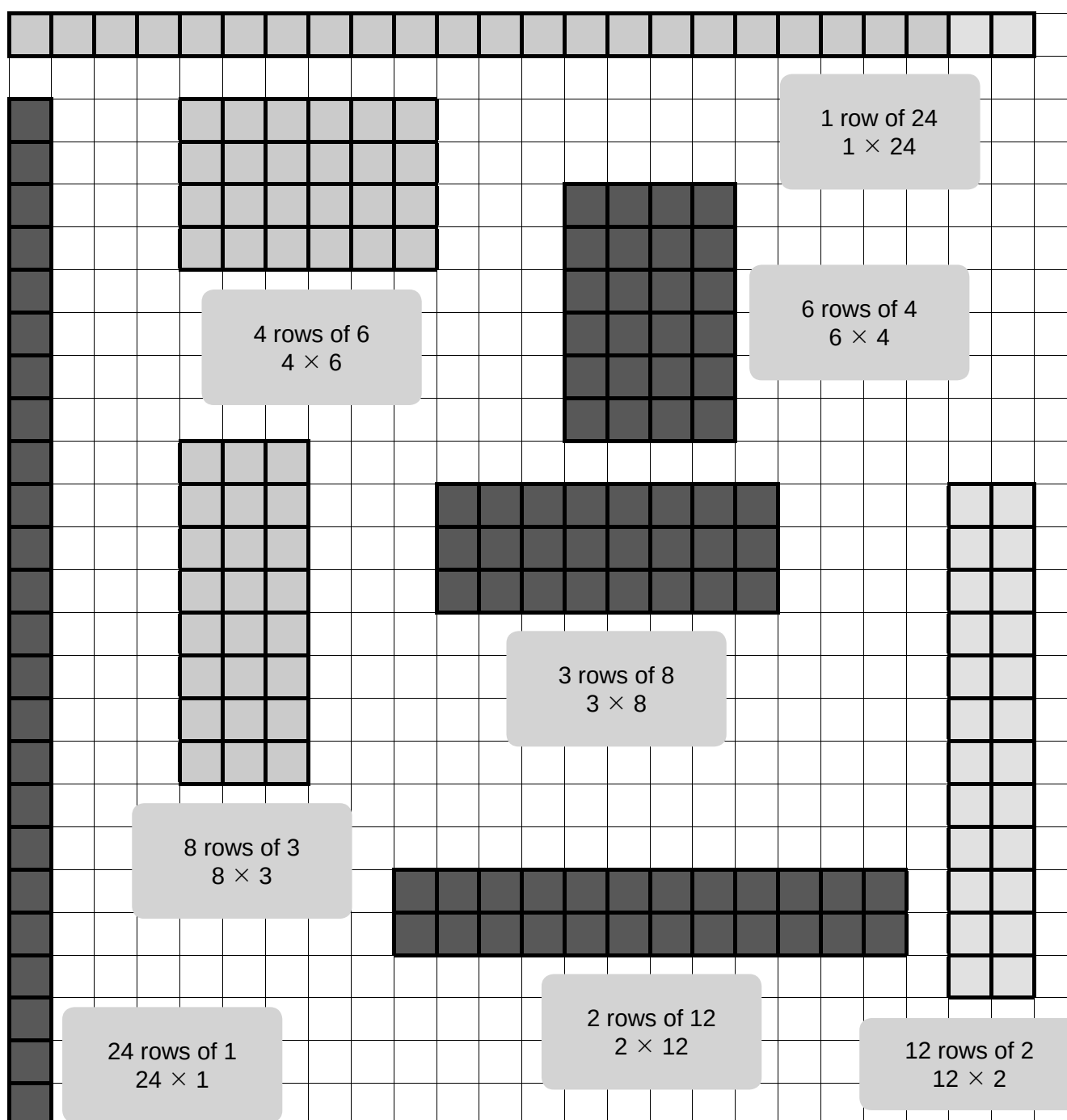
Look at the arrays in Activity 2.1, 'Matching multiplications'.

Four arrays have been drawn to show different arrangements that total 24.

Draw the reverse or matching arrays for those in the spaces provided on the grid.

Activity solutions

2.1 Matching multiplications



Day 3

Number and Capacity

2.2 Make arrays



Tutor instructions

The student may have difficulty knowing how to make arrays with equal rows.

One method is to allow the student to use trial and error independently.

Suggest to them that they make an array with one row, then two rows, three rows, four rows and finally 5 rows to see whether the counters can be arranged evenly.

If the student needs help, you can guide them through this activity by giving verbal hints.

Say

Which array is the most obvious one to start with? (1×18)

Now I will give you some time to make and draw the array and write its matching number sentence. (1×18)

If we start with that array, which array is the reverse or matching array? (18×1)

Now I will give you some time to make and draw the array and write its matching number sentence. (18×1)

So you have already found two factors of 18. Write the factors in the sentence after the grid.

Because 18 is an even number, which number goes into it evenly? (2)

Make two rows and see how many counters will be in each row. (9)

Make and draw the array and write its matching number sentence. (2×9)

Now you can make the matching array.

I will give you some time to make and draw the array and write its matching number sentence. (9×2)

Now you have found another two factors of 18. Add them to the sentence after the grid.

Make an array with three rows and see how many counters will be in each row. (6)

Now you will make and draw the array and write its matching number sentence. (3×6)

Now you can make the matching array.

Go ahead and make and draw the array and write its matching number sentence. (6×3)

Excellent! You have found another two factors of 18. Add these to the sentence after the grid.

Make an array with four rows and see how many counters will be in each row. (This doesn't work. There will be four rows with 2 counters left over.)

Make an array with five rows and see how many counters will be in each row. (This doesn't work. There will be three rows with 3 counters left over.)

We can stop trying to make arrays now because we have already made an array with 6 rows.

We have made all the reverse or matching arrays that are possible for 18.

Check to see you have filled in the sentence to show the factors of 18 are 1, 2, 3, 6, 9 and 18.

Now fill in the factor wheel.

Remember to put the factors that, when multiplied, make the middle total, 18.

1 should be opposite 18,
2 should be opposite 9,
3 should be opposite 6.

Number and Capacity

Day 3

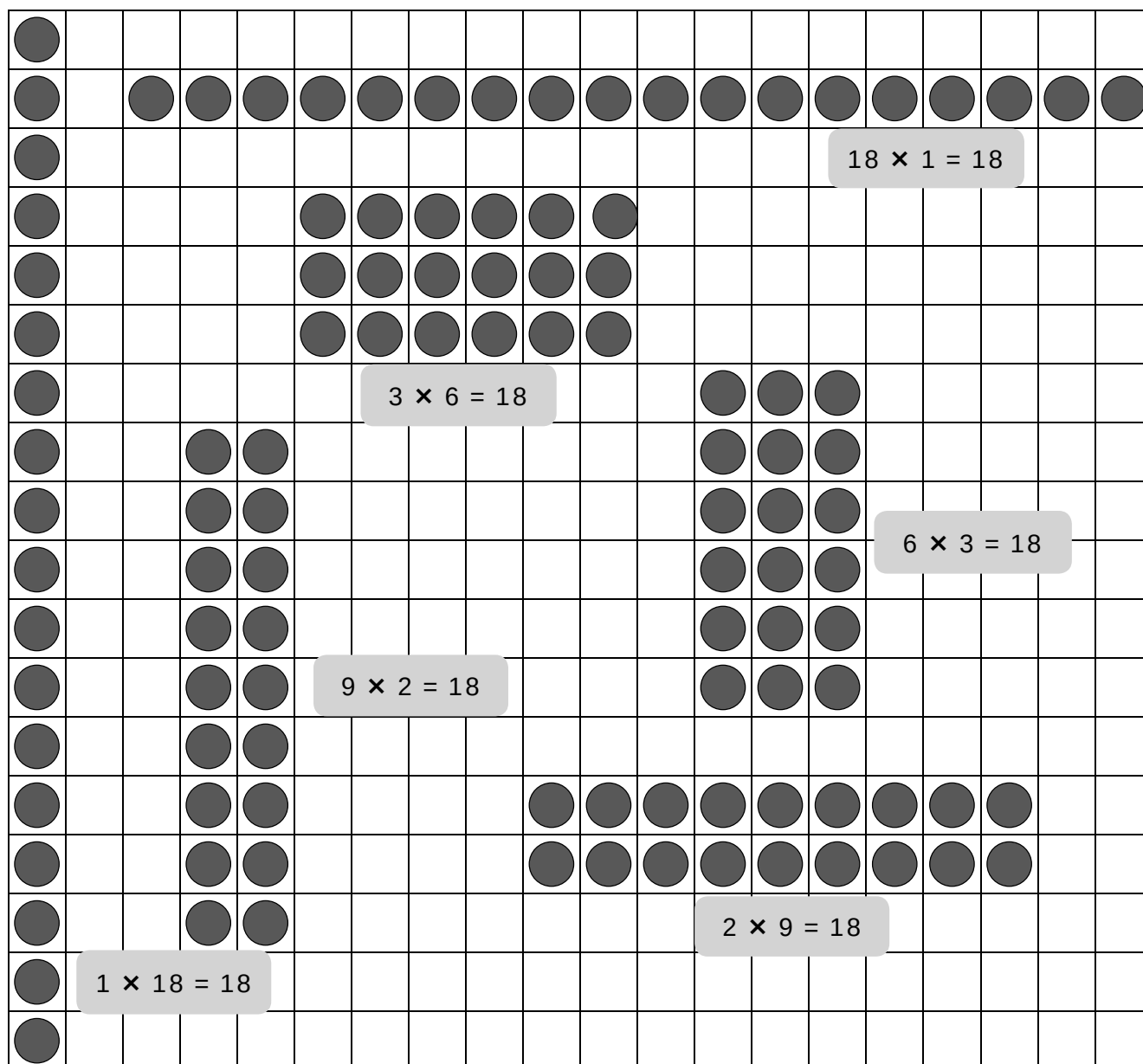
2.2 Make arrays

Background information

Students may have their arrays drawn in different positions on the grid.

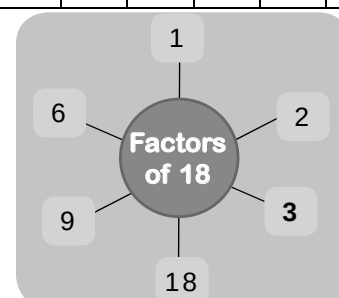
Activity solutions

a)



b) The factors of 18 are 1, 2, 3, 6, 9 and 18.

c) Factor wheel for 18.



Day 3**Number and Capacity****Activity 3: Revising the four times number facts****Activity solutions****3.1 Twos and fours are related**

- a) Skip count by twos and use a yellow coloured pencil to colour the numbers you land on.
 b) Skip count by fours and use a red coloured pencil to colour the numbers you land on.

The four times facts should turn orange when red is added to yellow on the grid.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

- c) Describe to your tutor what you see about the two sets of numbers. The student should see that the two and four times facts share some answers.

3.2 Using the two times facts**Activity solutions**

Students should know their two times number facts from memory. A good way to test this is to get them to complete the multiplication grid out of order.

For example, 6×2 , then 2×2 , then 5×2 , then 9×2 , then 1×2 etc.

$\times$	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20

We can 'double the doubles' to find the four times facts.

If the student knows the two times facts then they also know the four times facts because they simply double the answer to the two times facts.

For example:

$$\begin{array}{ll}
 3 \times 2 = 6 \text{ and } 3 \times 4 = 12 \text{ (12 is double 6)} & 5 \times 2 = 10 \text{ and } 5 \times 4 = 20 \text{ (20 is double 10)} \\
 7 \times 2 = 14 \text{ and } 7 \times 4 = 28 \text{ (28 is double 14)} & 9 \times 2 = 18 \text{ and } 9 \times 4 = 36 \text{ (36 is double 18)}
 \end{array}$$

3.3 Revising the four times facts

Activity solutions

Two times facts	Double the answer	Lots of 4	Multiplication sentence
$2 \times 2 = 4$	8	2 lots of 4	$2 \times 4 = 8$
$3 \times 2 = 6$	12	3 lots of 4	$3 \times 4 = 12$
$4 \times 2 = 8$	16	4 lots of 4	$4 \times 4 = 16$
$5 \times 2 = 10$	20	5 lots of 4	$5 \times 4 = 20$
$6 \times 2 = 12$	24	6 lots of 4	$6 \times 4 = 24$
$7 \times 2 = 14$	28	7 lots of 4	$7 \times 4 = 28$
$8 \times 2 = 16$	32	8 lots of 4	$8 \times 4 = 32$
$9 \times 2 = 18$	36	9 lots of 4	$9 \times 4 = 36$
$10 \times 2 = 20$	40	10 lots of 4	$10 \times 4 = 40$

3.4 Using a multiplication grid

Background information

Before the students begin answering the questions, you might like to practise reading multiplication number facts from the grid.

To read 8×4 in the grid, place your right forefinger on the eight along the horizontal coloured row and your left forefinger on the four along the vertical coloured column. Move the fingers along the column and row until they meet in a square (see example provided). The answer is 32.

Day 3

Number and Capacity



Tutor instructions

Give the students practice at reading the multiplication grid before attempting the word problems. You can ask the student a multiplication question, have them say the answer and then check that answer by using the multiplication grid.

×	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50

Before the student answers each of the word problems, have them tell you what the problem is asking.

Work through the first question with the student.

Ask the student to read the question. (How many legs on 6 cows?)

Ask the student how many legs on 1 cow. (4)

Explain to the student that we need to find how many legs are on 6 cows. This is the same as asking how many legs in 6 lots of 4.

Ask the student what number sentence they need to solve this problem. (6×4)

- How many legs on 6 cows? $6 \times 4 = 24$
- How many arms on 8 starfish? $8 \times 5 = 40$
- How many eyes on 9 boys? $9 \times 2 = 18$
- How many corners on 5 triangles? $5 \times 3 = 15$
- How many toes on 3 feet? $3 \times 5 = 15$
- How many paws on 7 dogs? $7 \times 4 = 28$
- How many hands on 4 chimps? $4 \times 2 = 8$

Number and Capacity

Day 3

Day 4

Number and Capacity

Day 4

Materials

- materials for grouping (counters, marbles, matchsticks, 2 cm cubes, MAB units, buttons, dried beans, straws etc)



Going mental

1. 100 more



Tutor instructions

Ask the student to give an explanation for their choice of answer.

This will help you to see whether they understand place value.

- 638 is the right answer because 548 is 10 more and 438 is 100 less.
- 2 102 is the right answer because 2 012 is 10 more and 2 202 is 200 more.
- 1 446 is the right answer because 2 346 is 1 000 more and 1 146 is 200 less.
- 3 099 is the right answer because 3 000 is 1 more and 2 899 is 100 less.
- 4 165 is the right answer because 3 065 is 1000 less 4 055 is 10 less.

Activity solutions

Circle the number that is 100 more than the number given.

	3 245	3 345	3 445	2 245
a)	538	548	438	638
b)	2 002	2 012	2 102	2 202
c)	1 346	2 346	1 146	1 446
d)	2 999	3 000	2 899	3 099
e)	4 065	4 165	3 065	4 055

If the student is having difficulty with this task, focus on the hundreds place and the need for that place to increase by 1.

2. Calendar work

- a) What day of the week is the 20th? Tuesday
- b) What is the date of the first Monday of the month? 5th
- c) What is the date of the last Thursday of the month? 29th
- d) What day is the last day of the month? Friday
- e) What day is it six days before the 28th? 22nd
- f) What is the date a fortnight after the 11th? 25th
- g) What is the date five days after the second Wednesday of the month? 19th
- h) This calendar could be used for 4 months

This calendar could be used for September, April, June or November because it has a total of 30 days.

3. Odd or even**Background information**

All even numbers end in a 0, 2, 4, 6, or 8 regardless of how large they are.

Activity solutions

38	35	42	177	124	78	90
24	29	560	345	903	82	67
266	172	96	59	127	340	455
98	653	54	111	405	36	39
440	79	276	235	754	210	322

Day 4

Number and Capacity



Moving on

Activity 1: Word problems



Tutor instructions

It is important that the student understands that a number sentence must match the story of the word problem. Even though reversing the numbers in the multiplication will give you the correct answer, it may not fit the story.

The student must also understand which part of the word problem represents the number of groups and which part of the word problem represents the number in each group.

Activity solutions

1.1 Write number sentences

a) One carton of orange juice costs \$2. How much does it cost for 6 cartons of juice?	
$6 \times 2 = 12 \text{ or } 6 \times \$2 = \$12$ The answer must be 6×2 and not 2×6 because you want to know the cost of 6 cartons at \$2 each, not 2 cartons at \$6 each.	
	
b) Michelle has 7 boxes of crayons. Each box holds 5 crayons. How many crayons does Michelle have?	
$7 \times 5 = 35 \text{ crayons}$ The answer must be 7×5 and not 5×7 because there are 7 boxes with 5 crayons in each box, not 5 boxes with 7 crayons in each.	
	

Number and Capacity

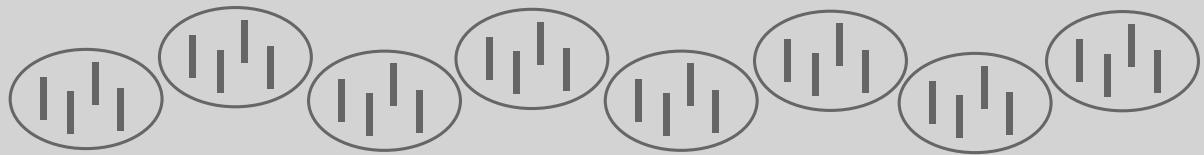
Day 4

- c) Each boy has 4 toy trucks. If there are 8 boys, how many trucks are there in total?



$$8 \times 4 = 32 \text{ trucks}$$

The answer must be 8×4 and not 4×8 because there are 8 boys with 4 trucks each, not 4 boys with 8 trucks each.

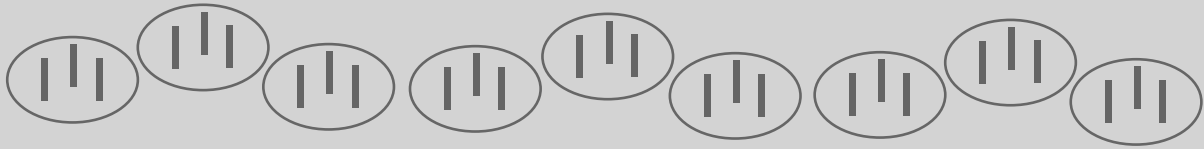


- d) Sam went to the park 9 times last week. Each time he went to the park he rode down the slide 3 times. How many times did Sam slide down the slide last week?



$$9 \times 3 = 27 \text{ times down the slide}$$

The answer must be 9×3 and not 3×9 because Sam went to the park 9 times and slid down the slide 3 times on each visit. He didn't visit the park 3 times and slide down the slide 9 times each visit.



- e) Each house in the street has 6 people living in it. If there are 10 houses, how many people live in the houses?



$$10 \times 6 = 60 \text{ people}$$

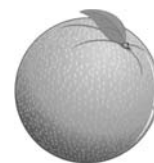
The answer must be 10×6 and not 6×10 because there are 10 houses with 6 people in each, not 6 houses with 10 people in each.



Day 4

Number and Capacity

- f) Each child has 3 oranges. If there are 4 children, how many oranges are there in total?



$$4 \times 3 = 12 \text{ oranges}$$

The answer must be 4×3 and not 3×4 because there are 4 children and each child has 3 oranges.



Tutor instructions

The examples for writing your own word problems are just one possibility. Answers will vary.

Again, make sure that the student can distinguish between the number of groups and how many, or how much, in each group.

Remind the student to think of the multiplication sign as another way of saying 'lots of'.

1.2 Write your own word problems

Write a word problem to match the number sentence.

a)



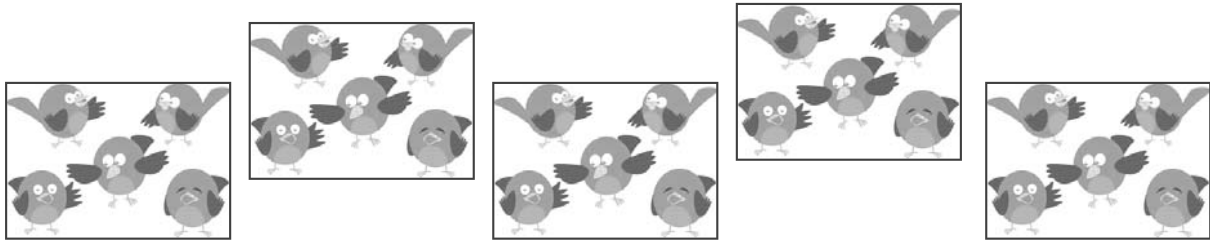
$6 \times 3 = 18$ Word problem: Answers will vary. There are six cans of tennis balls in the sports shed. Each can holds three balls. How many balls are there altogether?

b)



$9 \times 10 = 90$ Word problem: Answers will vary. Jasper has nine, ten cent coins in his wallet. How much money does he have altogether?

c)



$$5 \times 5 = 25$$

Word problem: There are five cages at the pet store. Each cage holds five birds. How many birds are there altogether?

d)



$$4 \times 6 = 24$$

Word problem: The Jones family has four fish bowls. Each bowl holds six fish. How many fish do the Joneses have?

Activity 2: Calculator activities



Tutor instructions

Read through the explanation of how to use the constant function on the calculator with the student.

Ask the student to follow Nelly's instructions to find the answer to the books problem. At this point, check that the student understands how to use the constant function, following the steps outlined.

The constant function

Key in:

- the starting number, if it is not zero
- the plus sign **+**
- the amount you are adding
- the equal sign **=** for each time that number is added.

Day 4**Number and Capacity****2.1 Using the constant function****Activity solutions**

The student should know the turn around facts for these questions.

a) 5×9

Answer = 45

9

18

27

36

45

Check using the constant function.

b) 4×7

Answer = 28

7

14

21

28

Check using the constant function.

c) 5×8

Answer = 40

8

16

24

32

40

Check using the constant function.

2.2 Broken button

a) $7 \times 8 = 56$ Each equal sign represents 1 lot of 8.

+ 8 = = = = = =

b) $4 \times 7 = 28$ Each equal sign represents 1 lot of 7.

+ 7 = = = =

c) $8 \times 6 = 48$ Each equal sign represents 1 lot of 6.

+ 6 = = = = = = = =

Activity 3: Multiples of 10

3.1 Revise the ten times facts

a) Total the coins.

 $8 \times 10c = 80c$	 $6 \times 10c = 60c$
 $3 \times 10c = 30c$	 $5 \times 10c = 50c$

b) Count backwards in 10s from 100.

100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0

c) Complete these from memory.

×	3	5	7	9	2	8	4	6	1	10
10	30	50	70	90	20	80	40	60	10	100



d) Talk to your tutor about the pattern you notice when numbers are multiplied by 10. What happens to a number multiplied by 10? What is the easy rule for multiplying by ten?

When a number is multiplied by 10, the answer is the same number with a 0 added to it in the ones column.

Day 4**Number and Capacity****3.2 Multiples of 10**

These are the multiples of 10.

458	30	795	510
110	5 405	6 290	348
80	2 430	873	402
6 917	26	560	400

Background information

The examples should show the student that when you multiply a number by a multiple of ten it is the same as multiplying two single-digit numbers and then adding a zero to the end of the number.

Multiplying a one-digit number by a multiple of ten follows the same process as multiplying two single-digit numbers.

For 3×50 , the thinking is $3 \times 5 = 15$. Because the 5 has been multiplied by 10 to make 50, you then multiply the answer of 15 by 10 to make 150. The student can check by using the constant function.

The student should know that when you multiply a number by 10, you simply add a 0 to the original number to find the answer.

Activity 3.3 is designed to show this relationship. If the student can't see this pattern you may like to try other activities on a calculator. Multiply 4×5 to show the answer of 20 and then multiply (4×50) or (40×5) to show 200. Use easy multiplication tables and do this until the student can predict the answer before you do it on the calculator

Activity solutions

3.3 Continue the pattern

$1 \times 2 = 2$	$10 \times 2 = 20$	$6 \times 2 = 12$	$60 \times 2 = 120$
$2 \times 2 = 4$	$20 \times 2 = 40$	$7 \times 2 = 14$	$70 \times 2 = 140$
$3 \times 2 = 6$	$30 \times 2 = 60$	$8 \times 2 = 16$	$80 \times 2 = 160$
$4 \times 2 = 8$	$40 \times 2 = 80$	$9 \times 2 = 18$	$90 \times 2 = 180$
$5 \times 2 = 10$	$50 \times 2 = 100$	$10 \times 2 = 20$	$100 \times 2 = 200$

3.4 Apply the rule

a) $1 \times 4 = 4$	$1 \times 40 = 40$	b) $6 \times 4 = 24$	$6 \times 40 = 240$
c) $5 \times 3 = 15$	$50 \times 3 = 150$	d) $7 \times 3 = 21$	$70 \times 3 = 210$
e) $6 \times 5 = 30$	$6 \times 50 = 300$	f) $8 \times 2 = 16$	$8 \times 20 = 160$
g) $4 \times 2 = 8$	$40 \times 2 = 80$	h) $9 \times 5 = 45$	$90 \times 5 = 450$

Day 4

Number and Capacity



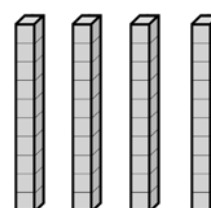
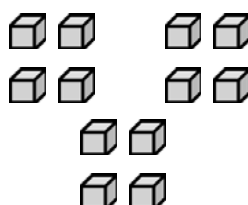
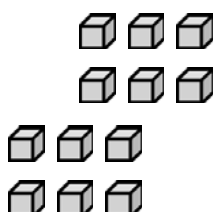
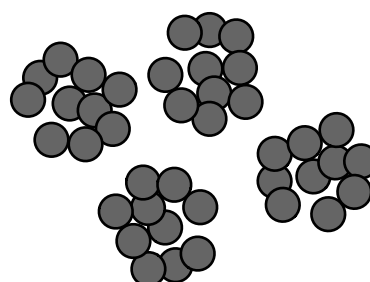
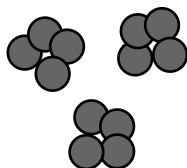
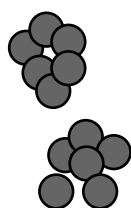
Stretching out



Tutor instructions

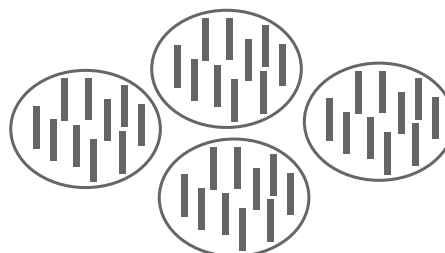
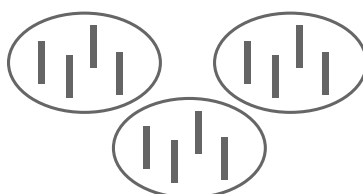
Allow the student to choose a method that they prefer to solve the problem.

They may use counters, other materials or MABs.



If using MABs, encourage the student to group together the unit cubes to make 1 ten. The final combination of MABs will be $6 \times$ longs (tens) and 4 units (ones).

They may solve the problem by drawing diagrams and counting the collection.



When the student is counting, encourage skip counting where possible, especially the tens.

They may solve the problem using repeated addition:

$$6 + 6 \text{ (baked beans)} + 4 + 4 + 4 \text{ (corn)} + 10 + 10 + 10 + 10 \text{ (soup)} = 64 \text{ cans}$$

They may solve the problem using multiplication:

$$2 \times 6 = 12 \text{ (baked beans)}$$

$$4 \times 3 = 12 \text{ (corn)}$$

$$4 \times 10 = 40 \text{ (soup)}$$

$$12 + 12 + 40 = 24 + 40 = 64 \text{ cans}$$

Number and Capacity

Day 4

Day 5**Number and Capacity****Day 5 – Review day****Materials**

- materials for grouping (counters, marbles, matchsticks, 2 cm cubes, MAB units, buttons, dried beans, straws etc)

**Tutor instructions**

Day 5 is a review day and, where possible, the student should work independently. You can help the student to ensure that questions are read carefully and all instructions are understood.

Encourage the student to use drawings, counters or any other materials on hand to help solve problems.

The teacher will mark the work. However, once all the activities have been completed, you can use the answers provided to check how the student has performed. No tutor notes are included for today's activities.

**Going mental****Activity solutions****1. Missing numbers**

$$\text{a)} \quad 5 + 15 = 20$$

$$\text{b)} \quad 25 - 10 = 15$$

$$\text{c)} \quad 60 + 25 = 85$$

$$\text{d)} \quad 20 + 30 = 50$$

$$\text{e)} \quad 46 - 20 = 26$$

$$\text{f)} \quad 25 + 15 = 40$$

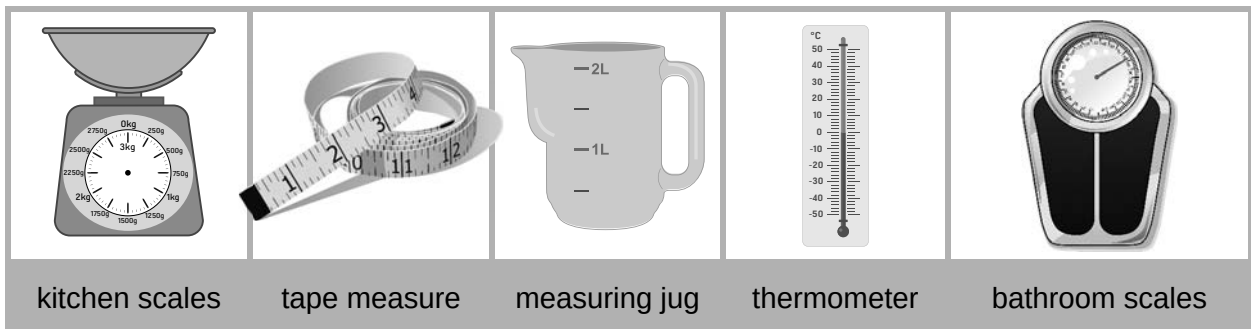
Number and Capacity

Day 5

2. Counting

- a) Count backwards in 10s from 992 to 882.
992, 982, 972, 962, 952, 942, 932, 922, 912, 902, 892, 882
- b) Count forwards in 100s from 1 435 to 2 535.
1 435, 1 535, 1 635, 1 735, 1 835, 1 935, 2 035, 2 135, 2 235, 2 335, 2 435, 2 535

3. Measuring instruments



Which of these instruments is used to measure:

- a) the mass of your dog? bathroom scales
b) the length of a table cloth? tape measure
c) the amount of butter used in a recipe? kitchen scales
d) the capacity of a cup? measuring jug
e) the temperature? thermometer

4. Coloured or not coloured?

- a) Record the parts of the group that are coloured and the parts that are uncoloured (not coloured).



3 out of 6 are coloured (or $\frac{1}{2}$ are coloured)
3 out of 6 are uncoloured (or $\frac{1}{2}$ are uncoloured)



3 out of 5 are coloured
2 out of 5 are uncoloured



4 out of 6 are coloured
2 out of 6 are uncoloured

Day 5

Number and Capacity

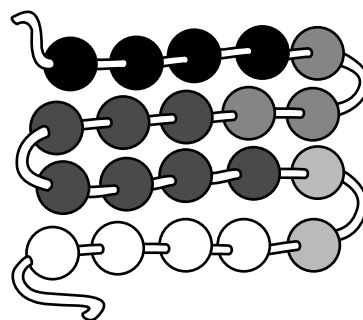
b) Colour the beads to match the instructions.

4 out of 20 beads blue

3 out of 20 beads red

7 out of 20 beads green

2 out of 20 beads yellow



How many beads are not coloured? 4 out of 20 are uncoloured



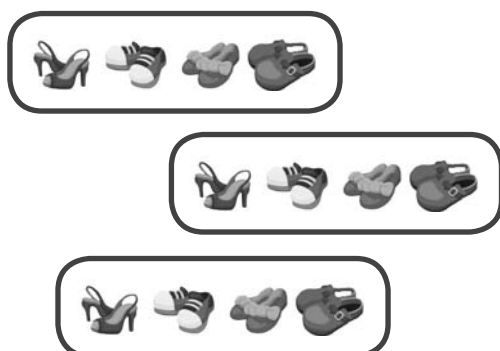
Moving on

Review 1: Repeated addition

Activity solutions

1.1 Number sentences

a)

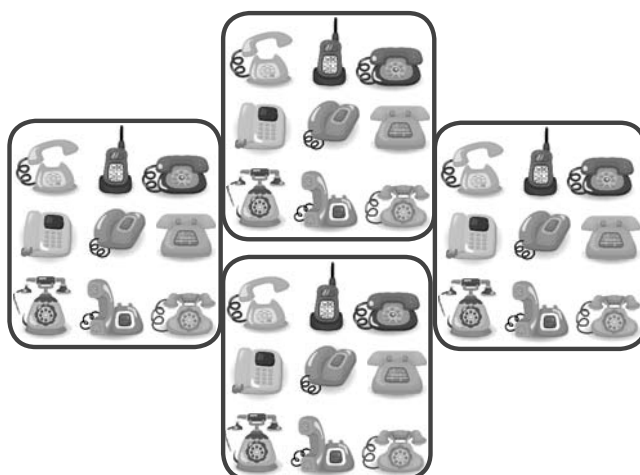


3 groups, 8 shoes in each.

$$3 \times 8 = 24$$

$$8 + 8 + 8 = 24$$

b)



4 groups, 9 phones in each.

$$4 \times 9 = 36$$

$$9 + 9 + 9 + 9 = 36$$

1.2 Multiply by adding

a) $5 + 5 + 5 + 5 + 5$

$5 \times 5 = 25$

b) $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$

$8 \times 2 = 16$

c) $4 + 4 + 4 + 4 + 4 + 4$

$6 \times 4 = 24$

d) $10 + 10 + 10 + 10$

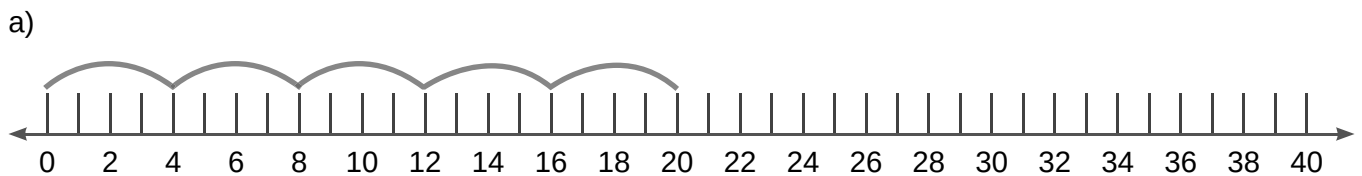
$4 \times 10 = 40$

e) $3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$

$9 \times 3 = 27$

1.3 Skip counting

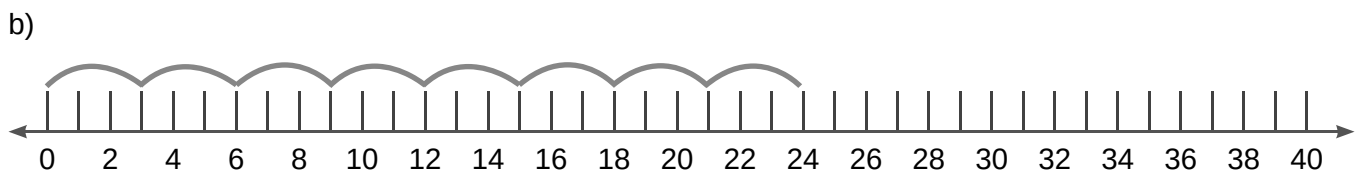
Write the addition and multiplication sentence that the jumps on the number line show.



Addition sentence: $4 + 4 + 4 + 4 + 4$

Multiplication sentence: 5×4

Answer = 20



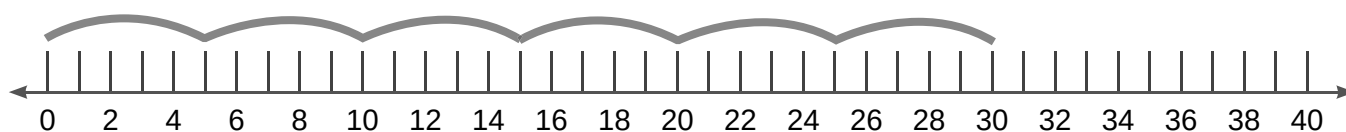
Addition sentence: $3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$

Multiplication sentence: 8×3

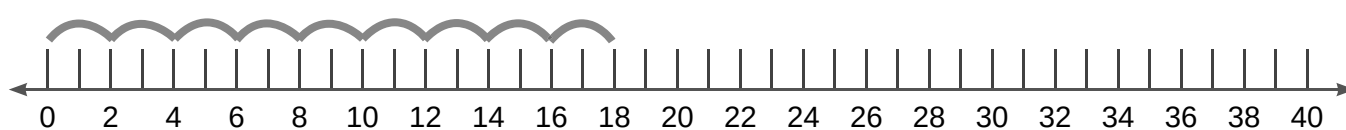
Answer = 24

Day 5**Number and Capacity**

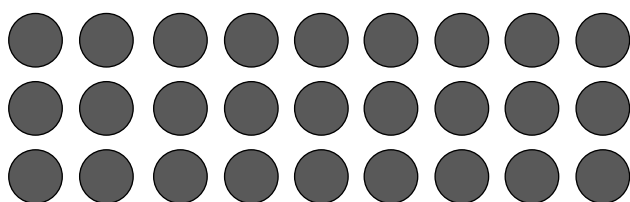
c)

Addition sentence: $5 + 5 + 5 + 5 + 5 + 5$ Multiplication sentence: $6 \times 5 = 30$

d)

Addition sentence: $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$ Multiplication sentence: $9 \times 2 = 18$ **Review 2: Order doesn't matter****Activity solutions****2.1 Arrays**

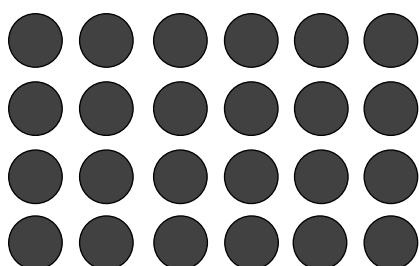
a)



$$\boxed{3} \times \boxed{9} = \boxed{27}$$

$$\boxed{9} \times \boxed{3} = \boxed{27}$$

b)



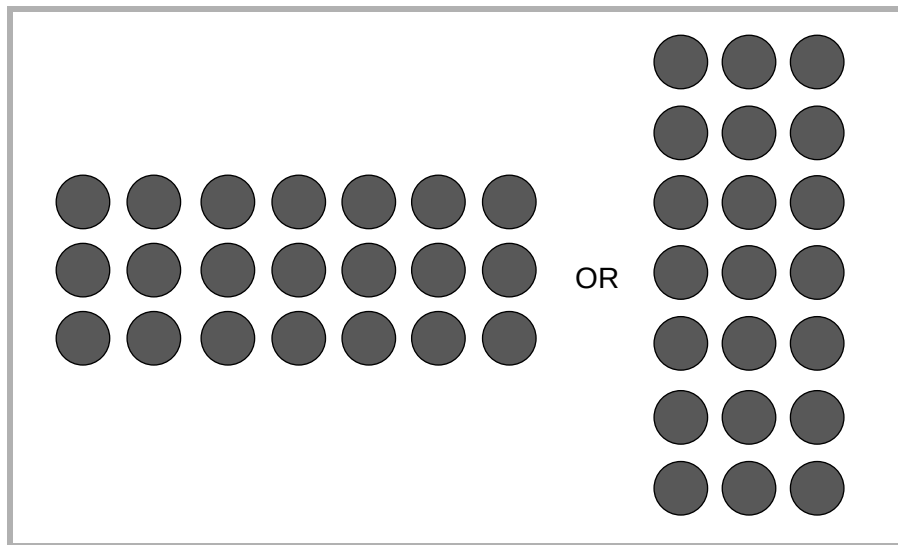
$$\boxed{4} \times \boxed{6} = \boxed{24}$$

$$\boxed{6} \times \boxed{4} = \boxed{24}$$

c)

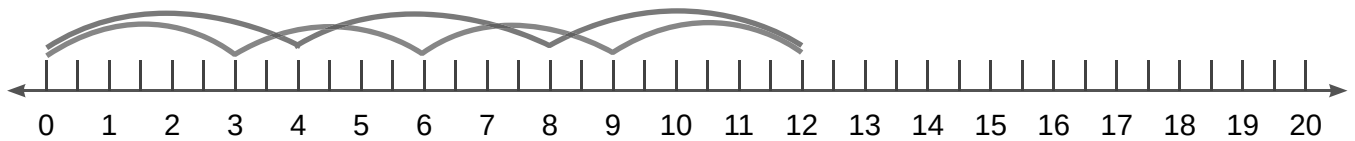
$$7 \times 3 = 21$$

$$3 \times 7 = 21$$



2.2 Number lines

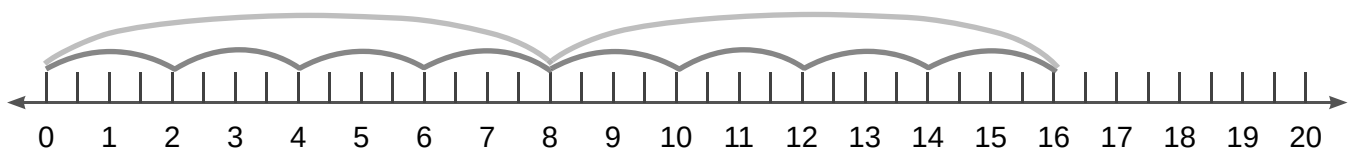
a)



$$\boxed{4} \times \boxed{3} = \boxed{12} \text{ and } \boxed{3} \times \boxed{4} = \boxed{12}$$

Two factors of 12 are 3 and 4.

b)



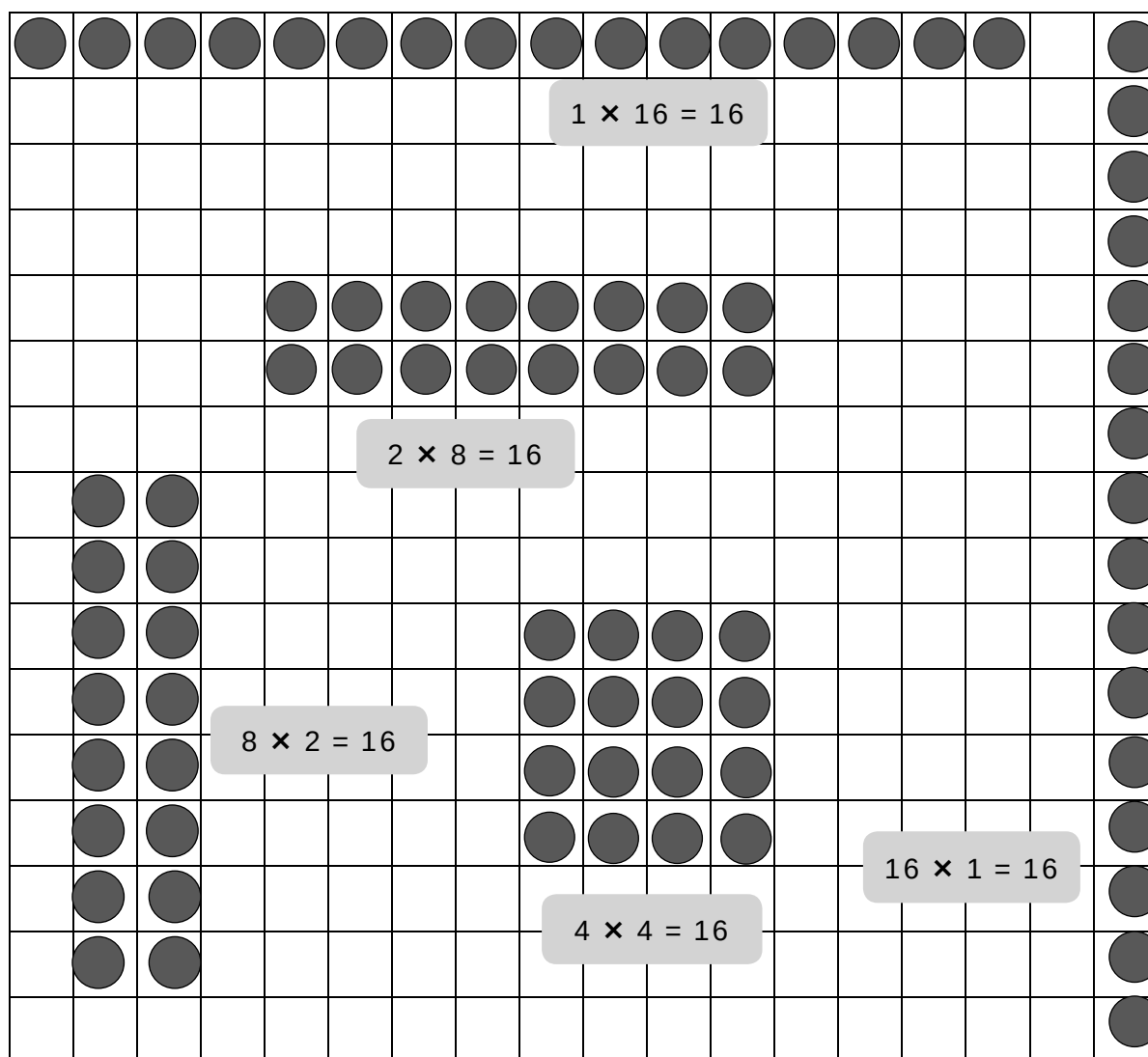
$$\boxed{8} \times \boxed{2} = \boxed{16} \text{ and } \boxed{2} \times \boxed{8} = \boxed{16}$$

Two factors of 16 are 2 and 8.

Day 5

Number and Capacity

2.3 Collections



The factors of 16 are 1, 2, 4, 8 and 16.

Review 3: Problems**Activity solutions****3.1 Solve these problems**

- a) $7 \times 4 = 28$ pieces of fruit
- b) $5 \times 6 = 30$ squares of chocolate

3.2 Write your own problem

$4 \times 20 = 80$

Word problem: Answers may vary. Chocolate eggs are sold in boxes of 20.
How many eggs are there in four boxes?

3.3 Revising multiplication facts

- | | |
|------------------------|------------------------|
| a) $6 \times 2 = 12$ | b) $9 \times 20 = 180$ |
| c) $3 \times 30 = 90$ | d) $6 \times 3 = 18$ |
| e) $8 \times 5 = 40$ | f) $8 \times 40 = 320$ |
| g) $9 \times 0 = 0$ | h) $9 \times 10 = 90$ |
| i) $6 \times 50 = 300$ | j) $4 \times 7 = 28$ |

Day 5

Number and Capacity



Stretching out

Multiplication game – roll your way to the lead



Tutor instructions

To play this game you will need a six-sided die and a ten-sided die.

To play your turn, roll both dice at the same time then multiply the two facing numbers together.

If you can answer the multiplication fact from memory, you score 5 points. If you need help from your tutor or the calculator and get the fact right, you score 2 points. A wrong answer scores 0 points.

If you roll a 6 on the six-sided die you can do one of two things.

- Multiply the other die number by 6 and score 10 points for a correct answer from memory or 2 points if you need help from your tutor or the calculator.
- Choose your own table to multiply by 1, 2, 3, 4 or 5 and score the same way as usual – 5 points for a correct answer from memory, 2 points if you need help or 0 points for an incorrect answer.

You can use a calculator to check any answers and to keep a running total of your points.

The winner of the game is the first person to score a total of 50 points.



Number and Capacity

Day 5

Day 6**Number and Capacity****DAY 6****Materials**

- two identical clear containers (glasses, plastic containers, bottles, bowls, small jars)
- two different-sized small containers
- bucket filled with water
- four cups of varying sizes
- a glass
- material (sand, flour, rice, sugar) for spooning task
- two tablespoons

**Going mental****Activity solutions****1. Ordering numbers**

Arrange these numbers in order from the biggest to the smallest.

a) 585 855 558 885

885, 855, 585, 558

b) 961 619 916 691

961, 916, 691, 619

c) 1 245 1 542 1 452 1 254

1 542, 1 452, 1 254, 1 245

d) 3 099 3 909 3 990 9 930

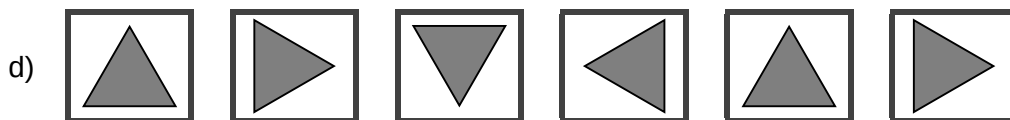
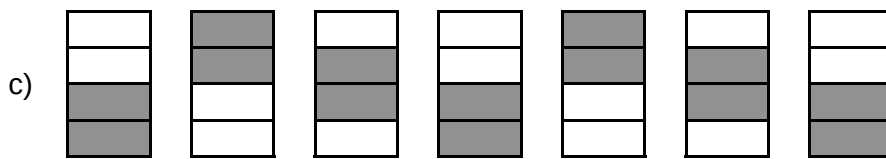
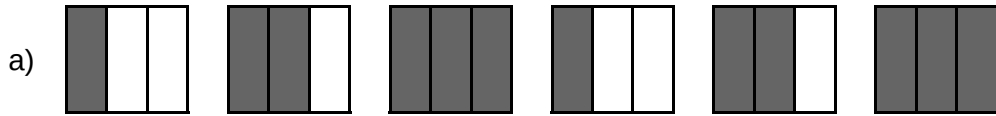
9 930, 3 990, 3 909, 3 099

e) 6 969 6 996 9 696 9 669

9 696, 9 669, 6 996, 6 969

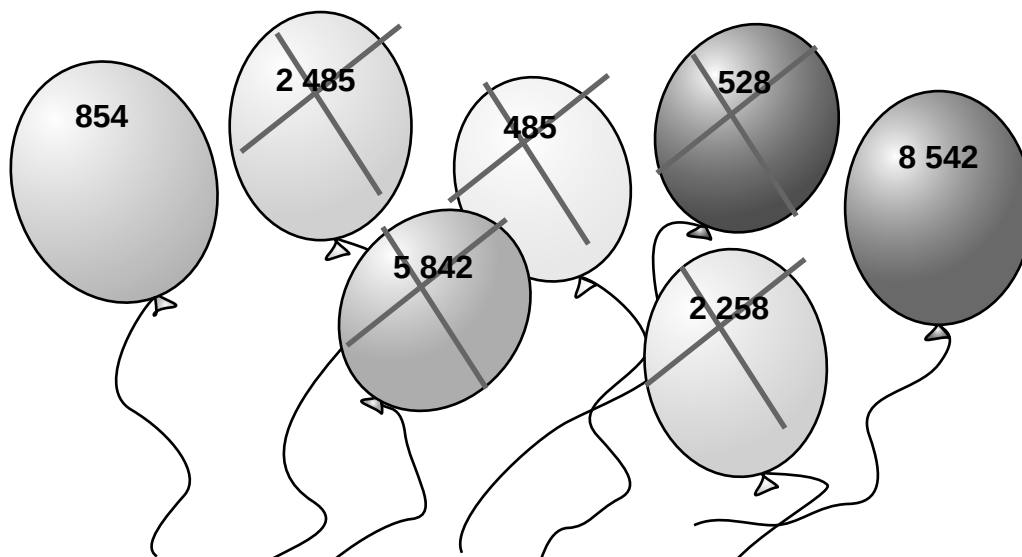
2. Finish the pattern

Look carefully at each pattern and draw the shape that comes next.



3. Pop the balloon

Write the number and put a cross through the matching balloon.



- a) Five hundred and twenty-eight – 528
- b) Four hundred and eighty-five – 485
- c) Five thousand, eight hundred and forty two – 5 842

Day 6**Number and Capacity**

- d) Two thousand, four hundred and eighty-five – 2 485
- e) Two thousand, two hundred and fifty-eight – 2 258
- f) Write the three digit number that has not been popped. 854
- g) Write in words the last number left. eight thousand, five hundred and forty-two

4. Skip counting money

a)



80c

b)



\$1.70

c)



\$1.80

d)



\$2.10

**Moving on****Background information**

Many of the activities that will be carried out this week involve the use of water and/or other 'messy' ingredients such as flour, rice, sugar or sand. You may prefer for the student to complete these activities in a 'wet area', such as a kitchen, bathroom, laundry, or outside.

To compare the capacity of two or more containers, students must pour from one container to the other.

To measure capacity, students also need to pour from one container into another.

These 'hands-on' activities are essential for the mathematical learning about capacity to occur.

Activity 1: Language of capacity

1.1 Pour to decide



Tutor instructions

Place two identical clear containers on a surface in front of the student. (plastic storage containers, glasses, bowl, or jar)

Fill one of the containers with water and leave the other empty.

You can substitute rice, flour, dried peas, lentils or sand for the water.

Say

'If you pour the water from that container (the one with water in it) into that container, will all of the water fit in or will there be some left over?' (It will all fit in.)



Tutor instructions

If the student doesn't answer that it will all fit in, ask why they think this.

They should be able to see that the containers are the same size and should hold the same amount.

After the student has answered the question, invite them to pour the water to find out.

Say

'What happened when you poured the water? (The container filled with water.)

Was your earlier answer right?

Do the containers hold the same amount of water? (yes)

Was it easy to tell? Why? (A probable answer is yes because they are the same size.)

Day 6**Number and Capacity****1.2 Pour to decide again****Tutor instructions**

Place two quite obviously different-sized clear containers in front of the student.

Fill the larger container with water and leave the other, smaller container, empty.

Say

If you pour the water from that container (the larger container) into that container, will it fit in or will there be some left over? (There will be too much water in the larger container for the smaller container because the container is larger.)

**Tutor instructions**

Invite the student to pour the contents of the container into the smaller container but stop them if it is about to overflow and focus on what is left in the first container.

Say

Is there too much water in your container for this container? (yes)

Does that mean that your container holds more or less water than this one? (My container holds more water. There is still some water left over in it.)

What would happen if you poured the contents of the smaller container into the larger container? (There would not be enough water to fill the larger container. You would need more water from somewhere else.)

So, which container holds more water? (the larger container)

We say that the larger container has a larger capacity.

Activity 2: What do you think?**2.1 Word flow****Tutor instructions**

The focus of this task is to have students use specific language relating to capacity. As the student completes the task encourage them to talk about what they thought would happen, for example, I thought that the tall cup would hold more but it didn't; the fat cup holds about the same amount of water as the coffee mug; when I poured the small cup into the biggest cup, the biggest cup only had a little bit of water in it, etc.

Number and Capacity

Day 6

Encourage the student to use words like full, over-full, overflowing, empty, almost empty, a little bit left over, holds more, holds less, nearly full, a full cup, a bit more.

Place four different-sized cups in front of the student. Try to use cups with an obvious difference in size – large mug, tea cup, espresso cup, coffee cup etc.

Once again, you can use water, sand, rice, lentils, dried peas or flour for this task.

Invite the student to compare the capacity of the cups by choosing the cup they think holds the most and filling it with water or another material.

Have them pour this cup into another cup to see which cup holds more.

As the student compares cups by pouring from one to the other, check that they understand the concept of one container holding more than another.

The focus for this activity is to develop the use of capacity specific language. Encourage them to describe and compare the capacities using the words listed above.

Help the student focus on what is happening to the water level in each container and how that relates to the relative capacity of the containers, for example, if the contents of the large container are poured into a smaller container, they will overflow. A smaller container will only partly fill a larger container with its contents.

Say

Now that you have finished with the pouring task, list the cups in order from the one that holds the least amount of water to the one that holds the most. (Answers will vary.)

Think about some of the words relating to capacity we have used and list them in your Activity Book. (These are the words listed in the tutor instructions above.)

2.2 How much does each hold?

Background information

Use this task to discuss with the student the concept of capacity being the amount of space inside an object. Different-sized containers have different-sized capacities.

The jug has a different capacity from the margarine container and bottle and the same capacity as the jar.

Activity solutions

a) Which container holds more water than the jug?

The bottle holds more water than the jug because when the jar is emptied, there is still room in the bottle for more.

Day 6**Number and Capacity**

- b) Which container holds less water than the jug?

The margarine container holds less water than the jug because when the jug is emptied into the margarine container there is still more water, so it overflows.

- c) The amount of space inside the containers is called the capacity.

Which container has the same capacity as the jug?

The container that has the same capacity as the jug is the jar. You can see by the picture that the jar is filled but not overflowing.

- d) If Pia had used sand instead of water, would the results be the same?

The results would be the same if Pia used sand or flour, or rice or other materials. The capacity of a container doesn't change no matter what it is filled with.

Activity 3: Spoonfuls**3.1 Careful counting****Background information**

The aim of this task is to highlight to students that, when measuring, it is important to be consistent. When filling cups, spoons, lids etc it is important that each item is filled in the same way each time. You can't half fill a cup or spoon and pour, then fill it to the brim or make it heaped and pour, as this will affect your measurements.

It is also important that the two containers are identical.

**Tutor instructions**

Ask the student to put 10 tablespoonfuls of the material you have chosen (sand, flour, rice or sugar) into one of the containers.

As the student is completing the task, you do the same. Place 10 tablespoonfuls of the material into the container. If possible use a different-sized spoon, perhaps a dessertspoon or teaspoon.

Look at the amount of material in both containers.

Are they the same?

Say

We both put 10 spoonfuls of material into our container.

Does it look like they have the same amount in each? (Answers will vary but the most probable answer will be no.)

Why are our levels different if we both counted out 10 spoonfuls? This is because both of us may have filled our spoons to different levels – sometimes heaped, sometimes less than one spoonful. Some material may have spilled whilst getting it out of one container to the other. Our units for measuring were also not the same. Our spoons were not the same size.

or

Look how clever we are! Both of our levels are the same in the jar. Why do you think this is? (We used the same-sized spoon.)

Unless we use the same measuring unit like the same-sized spoon, we can't compare the capacity of our containers.

3.2 Finish off the sentences**Tutor instructions**

Ask the student to complete the questions that follow on from the activity. These will help to reinforce that when measuring capacity, the units and levels must be consistent to ensure accuracy.

Activity solutions

- a) When you measure capacity, the unit you use (cup, spoon, jar, bottle or tub) must be the same throughout the measuring.
- b) When you measure capacity, the measurements must be consistent.
- c) When measuring in cups or lids or containers, these need to be filled to the same level.
- d) To measure the capacity you need to use the same unit of measure over and over again.

Day 7

Number and Capacity

Day 7

Materials

- four different-sized containers (not too large a capacity)
- cup
- objects to use as measuring units (lids, jar, ladle, can, small bottle)
- bucket full of water, sand or other material for pouring



Going mental

Activity solutions

1. The whole number

Write the numeral for each expanded number. An example has been done for you.

$$900 + 60 + 4 = 964$$

$$\text{d) } 800 + 80 + 6 = \boxed{886}$$

$$\text{a) } 200 + 30 + 9 = \boxed{239}$$

$$\text{e) } 1\,000 + 400 + 5 = \boxed{1\,405}$$

$$\text{b) } 300 + 8 = \boxed{308}$$

$$\text{f) } 4\,000 + 500 + 72 = \boxed{4\,572}$$

$$\text{c) } 800 + 50 + 9 = \boxed{859}$$

$$\text{g) } 6\,000 + 90 + 1 = \boxed{6\,091}$$

2. Measuring mass

Use the following masses to label the objects.

				
200 g	200 kg	20 g	2 kg	20 kg

Number and Capacity

Day 7

3. Patterns

a) Count by twos to complete the pattern.

36	34	32	30	28	26	24	22	20
----	----	----	----	----	----	----	----	----

b) Count by fives to complete the pattern.

65	60	55	50	45	40	35	30	25	20
----	----	----	----	----	----	----	----	----	----

c) Count by fours to complete the pattern.

4	8	12	16	20	24	28	32	36	40
---	---	----	----	----	----	----	----	----	----

4. Finding the right place

Use this picture to help you complete the following sentences.



between

left

above

right

below

Choose words from the box to finish these sentences.

- The train is below the light.
- The scooter is to the right of the drawers.
- The cupboard doors are to the left of the picture.
- The spinning top is between the vase and the boxes.
- The truck is to the left of the flower pot.
- The ball is below the bench seat.
- The camera is above the rocket.

Day 7

Number and Capacity



Moving on

Activity 1: Units of measure

1.1 Non-standard units

Background information

Non-standard units are units which are known to the student and easily available.

Non-standard units introduce the student to the use of units to produce numbers that describe a measure. Measurements are expressed by counting the total number of units used.

Activity solutions

Answers will vary. These answers are some of the possibilities.

Units (objects) for measuring small containers like a jug		
● cup	● glass	● jar
● lid	● small bottle	● handfuls
● eggcup	● ladle	● small containers

Units (objects) for measuring large containers like a bath		
● bucket	● bowl	● flowerpot
● saucepan	● vase	● watering-can
● measuring jug	● baby bath	● kettle

Number and Capacity

Day 7

1.2 Finding the best match

Background information

Choosing an appropriate unit that relates well to the object to be measured is an important step in the measuring process.

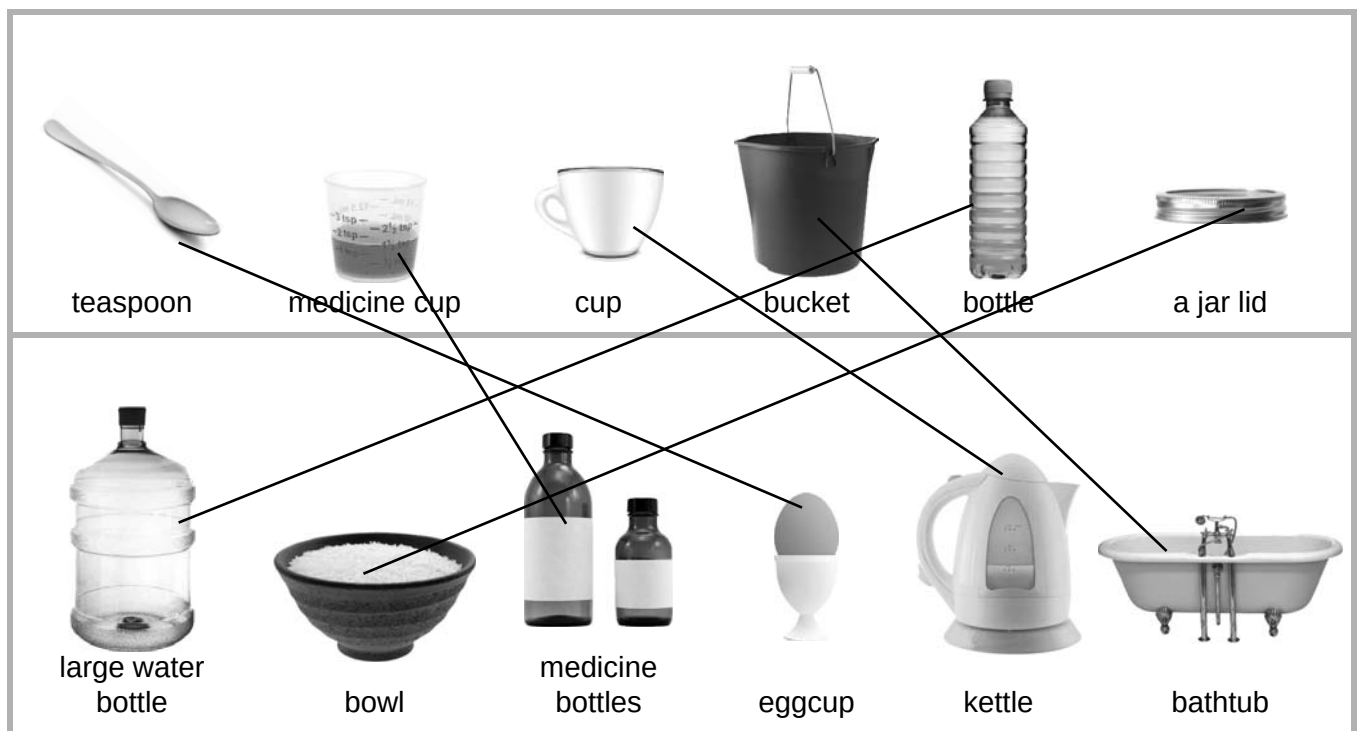
Choosing the right unit makes measuring the capacity more efficient.



Tutor instructions

Talk to the student about why you wouldn't use a jar lid to measure the capacity of the kettle (**it would take far too long**) or why you wouldn't use the bucket to measure the capacity of the medicine bottle. (**The bucket has a capacity that is larger than the medicine bottle.**)

Activity solutions



Activity 2: Different capacities

2.1 Deciding how to measure

Background information

When looking for containers for this task, try to find four containers that are a little different from each other – not extreme. For example you might have a 2 L ice-cream container, a plastic container, a 1 L drink bottle and a medium-sized jar so that the difference in their capacities is not too obvious to the student.

The unit used in this task to measure capacity is the cup.

The student must understand that when measuring, the unit used must be consistent so the cup chosen will be used to measure the capacity of all four containers. It is also important that each time the cup is filled; it is filled to the brim. This ensures consistency in measuring which is also important for accuracy of results.

Activity solutions

- a) Write the unit you will use to measure the capacity of the four containers
(The unit is the cup.)
- b) Explain why this unit has been chosen to measure the capacity of the containers.
(The cup has been chosen because it is a good size to use for all the containers, not too big or too small. It is also an easy object to hold and use.)



Tutor instructions

As the student starts the estimating process, talk about containers and capacity in general.

Does the container which is taller have a larger capacity? A long glass is taller than a shorter glass, but may not necessarily hold more water than the shorter glass.

Activity solutions

- c) Answers to the estimation and ordering task will vary depending on the containers you have chosen for the student.

2.2 Measuring the capacity



Tutor instructions

Ensure that the student measures consistently throughout this task – cup filled to the brim each time.

Activity solutions

Answers will vary.

2.3 Reviewing the results

Activity solutions

- a) Was your estimate of the order close to the results? Answers will vary.
- b) Explain a reason for this. Answers will vary.

Background information

This may be the first time that the student has had to estimate. Estimation is a skill that requires a great deal of practice.

Many students worry about getting an answer wrong when their estimations do not match suggested answers. Don't allow them to change their answers as they are really not wrong. They simply need more experience at this skill.

Here is a tip to help students improve their estimating skills. Rather than 'blindly' estimating the capacity of all four containers at once, have the student estimate the capacity of one container and then measure its capacity straight afterwards.

This allows the student to adjust their thinking for the next container.

This strategy is explained to the student in a task that follows.

2.4 The bits left over

Background information

Sometimes the capacity of an object is not a whole number answer and students are not sure of how to explain their measures. In later years, they will be able to use decimals and fractions to explain the parts of a whole measure.

At this stage, it is enough for the students to deal with the parts of a whole measure as: 'a bit more', 'almost', 'nearly', 'five and a half' or 'six full'.

Day 7

Number and Capacity

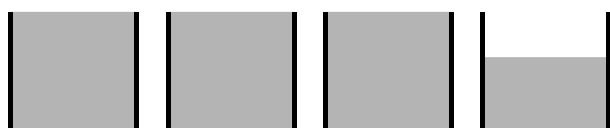
Activity solutions



- a) This capacity is almost five cups or four and three-quarters or a little bit less than five cups.



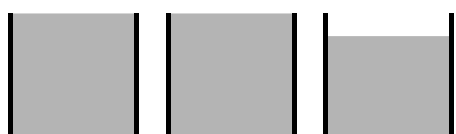
- b) This capacity is eight and a little bit more cups or almost eight and a half cups.



- c) This capacity is three and a half cups.



- d) This capacity is seven and a little bit more cups or just over seven cups.



- e) This capacity is almost three cups or two and three-quarter cups.

Activity 3: Pick your own unit of measurement

Activity solutions

3.1 Choosing your unit of measurement

For this task you will measure the capacity of the same four containers and once again order them from the container that holds the least amount of water to the container that holds the most.

Instead of using a cup as the unit of measure, you will choose your own unit to measure the capacity.

- Look at the four containers. Choose a unit, other than a cup, to measure their capacity. What unit have you chosen? Answers will vary.
- Does the unit have a smaller capacity, larger capacity or the same capacity as the cup you used before? Answers will vary.
- Explain your reason for choosing this unit. Answers will vary. The student should state that they chose a unit that matched the containers well – not too large or too small to measure the capacity.

3.2 Points to remember

The important points students need to remember are:

1. Use the same unit of measure to measure all containers so we can compare the capacities.
2. Fill the container to the brim every time to ensure consistency in measuring.

3.3 Measuring the capacity

- a) Will the order of the capacity change because you have changed the unit of measure?

No, the order of the capacity of the containers does not change because you have used a different unit of measure.

- b) Explain your answer. The capacity of a container never changes. The capacity tells how much the container will hold.

- c) Place the containers in their correct order in the table, where container 1 has the smallest capacity and container 4 has the largest capacity.

Answers will vary but students may look back to the result of the previous task.

- d) Estimate how many units will fill one container and then measure its capacity before moving onto estimating and measuring the next container.

Answers will vary.

- e) Did your results change the order of the containers?

The order should not have changed.

- f) Explain your answer.

The capacity of the containers does not change each time you measure it. What does change is the number of units used.

- g) Does the capacity of a container change when you use different units to measure it?

No, only the number of units used changes.

Day 8

Number and Capacity

Day 8

Materials

- standard measuring cup
- standard measuring jug
- small bucket of water
- funnel
- an empty 1 L soft drink or water bottle
- a permanent marker



Going mental

Activity solutions

1. Fours

Fill in each box with the correct number to make the number sentences true.

a) $5 \times 4 = \boxed{10} + 10$

d) $3 \times 4 = 20 - \boxed{8}$

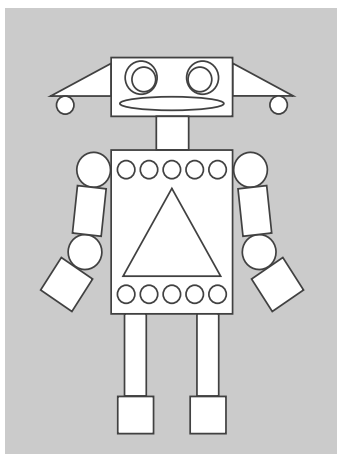
b) $4 + 4 + 4 + 4 + 4 + 4 = \boxed{6} \times 4$

e) $15 + 1 = \boxed{4} \times 4$

c) 4 more than 36 = $\boxed{10} \times 4$

f) $14 + 14 = \boxed{7} \times 4$

2. Taking shape



- a) Count and list the number of shapes used to construct Rosie.

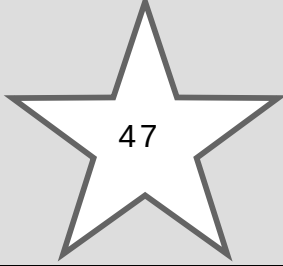
Squares 5 Triangles 3

Rectangles 6 Circles 20

- b) There are 15 more circles than squares.
There are 3 more rectangles than triangles.
- c) Rosie's mouth is made in the shape of an oval or ellipse.

3. Mystery number

Read the clues for the four mystery numbers. Write the number in the star.

Clues 1. This number is a multiple of 4. 2. It is an even number. 3. It is also a multiple of 5. 4. It is half of 40. 	Clues 1. This number is odd. 2. It is between 40 and 50. 3. The two digits add up to 11. 4. It is 13 less than 60. 
Clues 1. This number is a multiple of 5. 2. It is also a multiple of 10. 3. This number is half a century. 	Clues 1. This number is between 0 and 20. 2. It is an even number. 3. The two digits add up to 9. 4. It is a multiple of 3. 

4. Multiplication tables

a) $8 \times 2 = 16$

b) $3 \times 8 = 24$

c) $4 \times 3 = 12$

d) $4 \times 7 = 28$

e) $3 \times 5 = 15$

f) $5 \times 9 = 45$

g) $3 \times 0 = 0$

h) $3 \times 6 = 18$

i) $9 \times 4 = 36$

j) $3 \times 7 = 21$

Day 8

Number and Capacity



Moving on

Activity 1: Standard units



Tutor instructions

Read through and discuss the information about standard and non-standard units with the student.

1.1 Be a detective



Tutor instructions

Measuring jugs come in different shapes and sizes and so the scales used to measure capacity are not standard like the centimetre scale on rulers.

Students will discover that millilitres and litres are the standard units used in Australia to measure capacity. One L is equal to 1 000 mL.

Discuss the different terms found on the measuring jug. For example, pint and fl oz are units used in America to measure capacity.

Activity solutions

- Words and symbols that may be seen on measuring jugs include mL, L, cups, pint, fl oz
- Look closely at the markings on the jug and write how many millilitres are equal to 1 litre.
1 000 millilitres = 1 litre

1.2 Here's the proof



Tutor instructions

Ask the student to fill the measuring cup with water to the brim and using the funnel, pour it into the empty soft drink bottle.

Ask the student to use a permanent marker to mark the water level on the bottle. They should label this '1 cup'.

Ask the student to answer the question in their Activity Book.

- How much water have you poured into the bottle using 1 cup? (250 mL)

Have the student label the bottle beside the 1 cup mark with '250 mL'.

Number and Capacity

Day 8

Ask the student to fill the measuring cup to the brim with water for a second time and pour it into the soft drink bottle.

Ask the student to label the water level '2 cups'.

Ask the student to answer the question in their Activity Book.

b) Now how much water is in the bottle after 2 cups? (500 mL)

Have the student label the bottle beside the 2 cups mark with '500 mL'.

Ask the student to fill the measuring cup to the brim with water for a third time and using the funnel, pour it into the soft drink bottle.

Ask the student to label the water level '3 cups'.

Ask the student to answer the question in their Activity Book.

c) How much water is in the bottle after 3 cups? (750 mL)

Have the student label the bottle beside the 3 cups mark with '750 mL'.

Ask the student to fill the measuring cup to the brim with water again and using the funnel, pour it into the bottle a final time.

Ask the student to mark the water level and label it '4 cups'.

Ask the student to answer the question in their Activity Book.

d) How much water is in the bottle after 4 cups? (1000 mL or 1 L)

Have the student label the bottle beside the 4 cups mark with '1 000 mL'.

Direct the student to answer the other questions.

e) How many millilitres have you poured into the bottle in total? (1 000 mL)

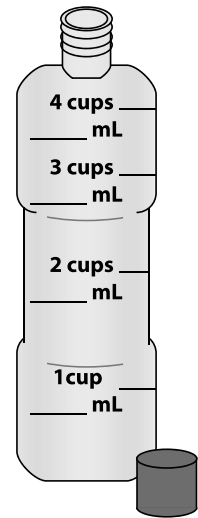
Does this amount equal 1 litre? (yes)

f) Write an addition number sentence that show the steps you have completed to prove that 1 000 mL = 1 L.

$$250 \text{ mL} + 250 \text{ mL} + 250 \text{ mL} + 250 \text{ mL} = 1\,000 \text{ mL or } 1 \text{ L}$$

g) Write a multiplication number sentence that show the steps you have completed to prove that 1 000 mL = 1 L.

$$4 \times 250 \text{ mL} = 1\,000 \text{ mL or } 1 \text{ L}$$



Activity 2: Searching for litres and millilitres

2.1 Less than 1 L

Answers for this task will vary.

2.2 How much is a litre?



Tutor Instructions

Reinforce to the student that you can't tell an object's capacity by its size or shape.

Two containers can have the same capacity but look totally different.

Supervise the student as they search for six objects – two that have a capacity of about 1 litre, two that have a capacity less than 1 litre and two that have a capacity greater than 1 litre.

Direct the student to keep referring back to their two examples of 1 L capacity (measuring jug and measuring bottle) to help them choose the containers.

a) Answers will vary for the type of container chosen for each category.

Direct the student to check their estimates by pouring water from each container into a measuring jug.

They should fill each container with water. Then pour the water from the container into the empty measuring jug or bottle.

Care should be taken because some of the containers will hold more than one litre and if poured into the measuring device, will overflow.

If the student has estimated the container's capacity correctly, direct them to tick it off in the Activity Book.

b) When the student has measured the capacity of all six containers, ask them to draw each container under the correct heading. Answers will vary.

c) This is another opportunity to explain to the student that estimates which are not right are technically not wrong. Student should be reminded that estimating skills improve with practice. Estimations that are close to actual measurement are considered 'reasonable'.

d) Another method to use would be to fill a measuring jug or container with 1 L of water and then test to see whether the container they are measuring holds less than, more than or about the same amount of water.

If the container has a smaller capacity than 1 L there will still be water left in the measuring jug and the container will be full.

If the container has a larger capacity than 1 L, all of the water from the measuring jug will have poured out and there will still be space in the container.

If the container has a capacity of about 1 L, all the water from the measuring jug will fit exactly into the container.

Give the student feedback on how clearly they explained their thinking.

Activity 3: Capacity in litres and millilitres

Activity solutions

3.1 More than a litre

Circle the objects that would have a capacity greater than one litre.

- a) a bucket
- b) a handbasin
- c) a medicine container
- d) a swimming pool
- e) a teacup
- f) a soup ladle

3.2 Less than a litre

Circle the objects that would have a capacity less than one litre.

- a) an eggcup
- b) a bathtub
- c) a medicine cup
- d) a swimming pool
- e) a rainwater tank
- f) a jam jar

3.3 Use the short form

Use the short form (symbol) to write these:

- | | | |
|-------------------|--------------------|--------|
| a) 6 litres – 6 L | b) 46 millilitres | 46 mL |
| c) 9 litres | d) 85 millilitres | 85 mL |
| e) 25 litres | f) 130 millilitres | 130 mL |
| g) 64 litres | h) 700 millilitres | 700 mL |

Day 8**Number and Capacity****3.4 How many millilitres?**

How many millilitres are there in:

a) 1 litre – 1 000 mL

b) 5 litres 5 000 mL

c) 2 litres 2 000 mL

d) 9 litres 9 000 mL

e) 7 litres 7 000 mL

f) 13 litres 13 000 mL

Number and Capacity

Day 8

Day 9**Number and Capacity****Day 9****Materials**

- bucket of water
- funnel
- three containers with a capacity smaller than 2 L.
- standard measuring cup
- standard measuring jug
- measuring bottle from Day 7

**Going mental****Activity solutions****1. Number patterns****Tutor instructions**

Ask the student to describe the pattern in each activity.

- | | |
|-----------------------------|---------------------------|
| a) increases by 20 (+ 20) | e) increases by 5 (+ 5) |
| b) increases by 10 (+ 10) | f) decreases by 5 (– 5) |
| c) decreases by 100 (– 100) | g) decreases by 3 (– 3) |
| d) decreases by 50 (– 50) | h) increases by 11 (+ 11) |

Activity solutions

- | | |
|---------------------------------|---------------------------------|
| a) 3, 23, 43, 63, 83, 103 | e) 145, 150, 155, 160, 165, 170 |
| b) 110, 120, 130, 140, 150, 160 | f) 80, 75, 70, 65, 60, 55 |
| c) 870, 770, 670, 570, 470, 370 | g) 97, 94, 91, 88, 85, 82, 79 |
| d) 400, 350, 300, 250, 200, 150 | h) 22, 33, 44, 55, 66, 77, 88 |

2. Prisms or Pyramids?

Background information

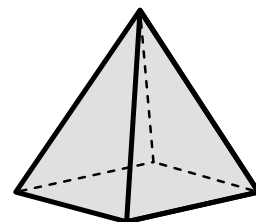
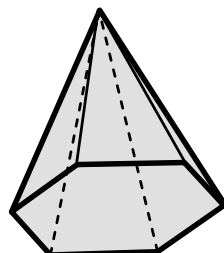
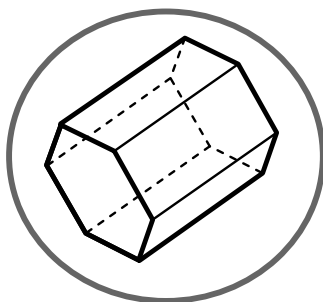
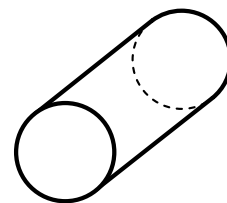
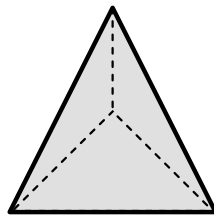
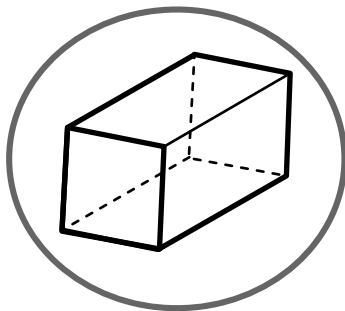
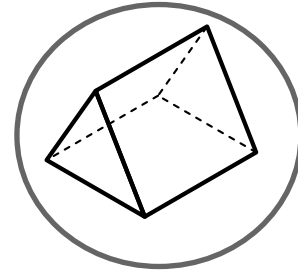
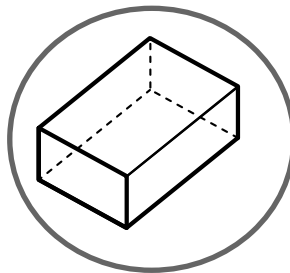
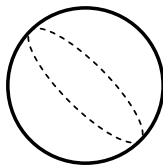
Prisms are solid objects with two identical end faces. All other faces of a prism are rectangles. A prism takes its name from the shape of its end faces.

- a) The prisms in this activity are a rectangular prism, triangular prism, square prism and hexagonal prism.

Pyramids are solid objects with a polygon as a base and triangular faces that meet at a point (vertex or apex). A pyramid takes its name from the shape of its base.

- b) The pyramids in this activity are a triangular pyramid, hexagonal pyramid and square pyramid.
- c) The two shapes left unshaded or not circled are a sphere and a cylinder.

Activity solutions



Day 9

Number and Capacity

3. Solve these problems

Background information

There are many strategies the student may have used to solve the problems. These explanations provide some of the strategies.

The student will explain the thinking involved in solving each number sentence. Let the student know whether they explained their thinking clearly.

Activity solutions

- a) Aramis has 14 goldfish. His father buys him another 9. How many goldfish does Aramis have now?

Number sentence: $14 + 9 = \boxed{?}$

Solve it. $14 + 9 = 23$

Add ten: 9 is almost 10 so add 10 to 14. So $10 + 14 = 24$. 9 is one less than 10 so the answer is 1 less than 24. The answer is 23.

Use known facts: $4 + 9 = 13$ so $14 + 9 = 23$

Use the split strategy: $14 + 9 = 10 + 4 + 9$
 $= 10 + 13 = 23$

- b) Samuel owns 32 marbles and Mia owns 8 marbles. What is the difference in the number of marbles the children own?

Number sentence: $32 - 8 = \boxed{?}$

Solve it. $32 - 8 = 24$

Use known facts: $12 - 8 = 4$ so $32 - 8 = 24$

Count back: Count back 8 from 32: 31, 30, 29, 28, 27, 26, 25, 24

Make the ten: $32 - 8 = 32 - 2 - 6$
 $= 30 - 6 = 24$

- c) Brianna has 6 red dresses. She has 4 more blue dresses than red ones. How many dresses does Brianna have altogether?

Number sentence: $6 + (6 + 4) = \boxed{?}$. To make the number of blue dresses add four more blue to the number of red. So $4 + 6$.

Solve it. $6 + (6 + 4) = 6 + 10 = 16$

Use known facts: $10 + 6 = 16$

Count on: Count on 6 more from 10: 11, 12, 13, 14, 15, 16



Moving on

Activity 1: Measuring capacities smaller than 2 L

1.1 Measuring capacity in cups



Tutor instructions

Choose three containers for the student with a capacity less than 2 L. Label the containers 1 to 3. Make these containers, a funnel, a standard measuring cup and a bucket of water available to the student.

Explain to the student that today they will estimate and then measure the capacity of three containers, each with a capacity less than 2 litres. They will then record their information on a graph.

Ask the student to choose container 1.

Say

Why do you think we are using this cup to measure the capacity today? (It is a standard measuring cup.)

Do you remember how many millilitres there are in one standard cup? (250 mL)

How many cups of water do you think it will take to fill container 1? (Answers will vary.)

Record your estimate in the 'Estimate' box under container 1 on the graph.

Now use the water and measuring cup to find the capacity of container 1.

Explain to me how you will measure the capacity of container 1. (I will fill the cup with water and then pour the water into the container. I will need to count how many cupfuls fit into the container.)

How are you going to keep count of the number of cupfuls you use? (Answers will vary.)

How will you record the capacity on the graph? (I will colour in 1 block for every cup of water. So if the capacity of container is 6 cups I will colour in six lots of 1 cup blocks.)

How will you show measurements that are not exact cups? (If the capacity is 6 and a half cups, I can colour in 6 lots of 1 cup blocks and then another half of a 1 cup block. If the capacity is 6 cups and a little bit more, then I will colour in 6 lots of 1 cup blocks and a little bit more of another 1 cup block.)

Go ahead and measure the capacity of container 1.

Day 9**Number and Capacity****Tutor instructions**

Check to see that the student is using full cups of water, the funnel for accuracy and that an accurate count is made.

Remind the student of how they planned to show part cupfuls on the graph.

Say

How many cupfuls of water were actually needed to fill container 1? (Answers will vary.)

Write the amount in the 'Measure' box at the bottom of the column for container 1.

How close was your estimate to the actual measure?

How can you use this information to help you with your next estimate? (If I was close with this estimate I must be on the right track. If my estimate was too high or low then I will have to change my thinking for the next container.)

**Tutor instructions**

Direct the students to continue to estimate measure and record the capacity of the other two containers following the same steps. Ensure accurate measuring methods and careful counting.

Once the student has completed the measuring and recording of information at the bottom of the graph, allow the student time to complete the graph, checking that the correct amount on the graph is coloured in.

Use a different coloured pencil for each container.

Work with the student to help them show 'parts of wholes' on their graph if necessary. Ask the student to write a suitable title for the graph.

Activity solutions

Answers relating to the graph will vary.

1.2 Checking your skills



Tutor instructions

Ask the student the following questions about the task today.

- Which container held the most water?
- Which container held the least water?
- Did the tallest/widest container hold the most water? Why?
- Did the shortest/slimmest container hold the most water? Why?
- If you did the task again with the same containers, would the results be the same? Why?
- How important is it that the cup is filled to the top each time? Why?
- How did the funnel help you with the accuracy of this task?

Complete the 'Checking your skills' review of their measuring skills by ticking the relevant box.

Activity 2: Reading scales



Tutor instructions

Read through the explanations about jug scales with the student.

If possible, show the student different measuring jugs and cups. You may have to reinforce the fact that different jugs have different scales.

Activity solutions

2.1 Different scales

Read the scales on each jug and write down how much liquid is held in each.

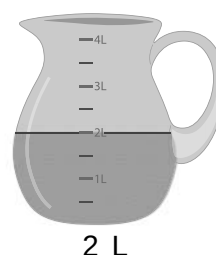
a)



b)



c)



d)



e)



Day 9**Number and Capacity****2.2 Litre jugs**

State how much liquid, in millilitres, is held in each jug.

a)



500 mL

c)



800 mL

b)



300 mL

d)



650 mL

2.3 Mark the amount

Colour in the jug to show the following millilitre measures.

a)



300 mL

c)



1 000 mL

b)

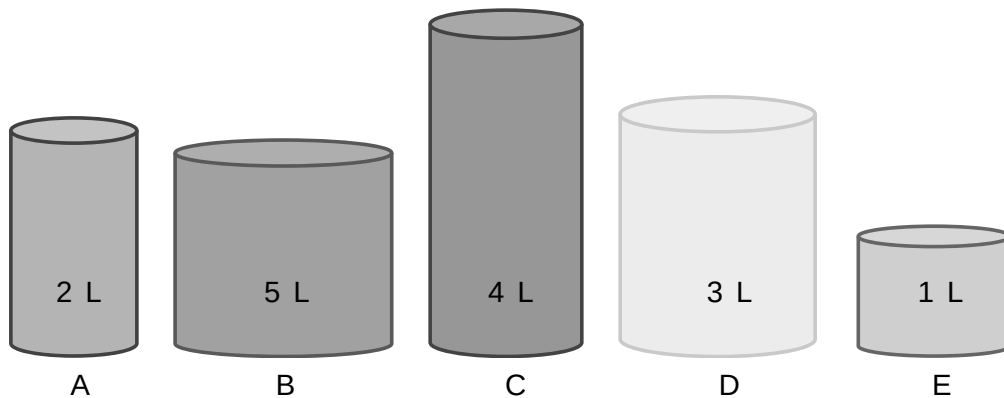


450 mL

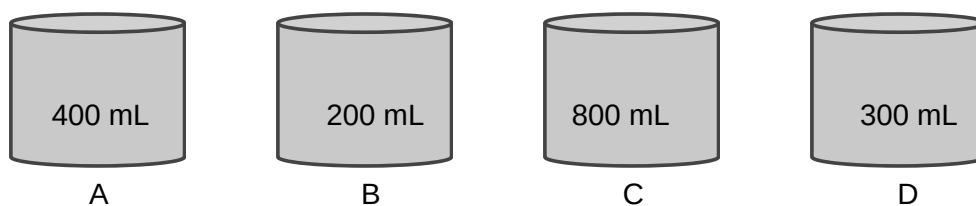
d)



250 mL

Activity 3: Working with litres and millilitres**Activity solutions****3.1 Capacity in litres**

- a) Which container holds the most water? Container B – 5 L
- b) Which container holds the least water? Container E – 1 L
- c) Which container holds more water than D but less than B? Container C – 4 L
- d) Which container holds less water than A? Container E – 1 L
- e) Which container holds more water than C? Container B – 5 L
- f) How much water would be needed to fill both containers B and E? 6 L

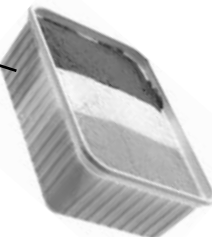
3.2 Capacity in millilitres

- a) How much water is in container C? 800 mL
- b) How much water is in container D? 300 mL
- c) How much more water is in container A than B? 200 mL
- d) How much more water is in container A than D? 100 mL
- e) How much water needs to be added to container A to make 1 L? 600 mL
- f) How much water needs to be added to container B to make 1 L? 800 mL

Day 9

Number and Capacity

3.3 Approximate capacity

4 L	300 mL	100 mL	3 L	12 L
				
kettle	perfume bottle	watering-can	drink box	ice-cream tub

Connections: 4 L to kettle, 300 mL to perfume bottle, 100 mL to watering-can, 3 L to drink box, 12 L to ice-cream tub.



Stretching out

Reading unmarked scales

a) How many standard cups made your 1 000 mL or 1 L jug? 4 cups

b) What is the capacity of one standard measuring cup? 250 mL

c) Answer these equivalence problems.

one litre (1 L) =

1 000 mL

half a litre ($\frac{1}{2}$ L) =

500 mL

a quarter of a litre ($\frac{1}{4}$ L) =

250 mL

three-quarters of a litre ($\frac{3}{4}$ L) =

750 mL

Number and Capacity

Day 9

d) Read the measurements on these jugs.

a)

 $2\frac{1}{2}$ L or 2 500 mL

b)

250 mL or $\frac{1}{4}$ L

c)

 $1\frac{1}{2}$ L or 1 500 mL

d)

 $1\frac{1}{2}$ L or 1 500 mL

e)

750 mL or $\frac{3}{4}$ L

Day 10

Number and Capacity

DAY 10 – Review day



Tutor instructions

Day 10 is a review day and, where possible, the student should work independently. You can help the student to ensure that questions are read carefully and all instructions are understood.

Encourage the student to use drawings, counters or any other materials on hand to help solve problems.

The teacher will mark the work. However, once all the activities have been completed, you can use the answers provided to check how the student has performed. No tutor notes are included for today's activities.

1. How many tens?

	MABs	Number	Total tens
a)		68	6 tens
b)		203	20 tens
c)		357	35 tens
d)		680	68 tens
e)		1 035	103 tens

Number and Capacity

Day 10

2. Count and write

	Coins	Numbers	Words
		\$1.25	One dollar and twenty-five cents
a)		\$2.65	Two dollars and sixty-five cents
b)		\$3. 40	Three dollars and forty cents
c)		\$0.85 or 85c	Eighty-five cents
d)		\$3.15	Three dollars and fifteen cents
e)		\$4.05	Four dollars and five cents

Day 10**Number and Capacity****3. Write in words**

Read each number out loud to your tutor then write each of the numbers in words.

	Numerals	Words
	1 781	One thousand, seven hundred and eighty-one
a)	540	Five hundred and forty
b)	836	Eight hundred and thirty-six
c)	907	Nine hundred and seven
d)	3 545	Three thousand, five hundred and forty-five
e)	5 480	Five thousand, four hundred and eighty
f)	6 008	Six thousand and eight

**Moving on****Review 1: Careful measuring****Activity solutions****1.1 Different but right**

Jacob and Marla can both be right.

The capacity of the container has not changed.

The unit of measure chosen by Jacob and Marla is different so their answers to the capacity will be different.

Jacob and Marla will have remembered to use the same unit of measurement throughout their capacity task.

1.2 Different but not right

Riley must have measured more accurately than Savannah.

Savannah may not have filled her cup to the brim, she may have spilt some of the water before putting it into the container or she may have miscounted the number of cups she used.

Review 2: Calculating the capacity**2.1 Least and greatest capacity**

To work out the capacity of the containers, you would use the measuring cup to measure the capacity of each container, carefully filling the cup to the brim each time and counting how many cups it takes to fill the container.

2.2 Ordering capacity

To calculate the capacity of the containers without the use of the measuring cup, you would compare the three containers by pouring from one container to another, just like the example by Pia on Day 6 and see how full each of the containers is when it is filled with water from one of the other containers.

Review 3: Understanding litres and millilitres**3.1 More than a litre**

Answers will vary but may include bathtub, bucket, sink, washbasin, laundry trough, toilet bowl, cooking pot, watering-can.

3.2 Less than a litre

Answers will vary but may include, small saucepan, frying pan, glasses, mugs, small bottles, jars, soup bowls.

3.3 Use the short form

Use the short form (symbol) to write these:

a) 8 litres

8 L

b) 5 millilitres

5 mL

c) 12 litres

12 L

d) 43 millilitres

43 mL

e) 47 litres

47 L

f) 690 millilitres

690 mL

Day 10**Number and Capacity****3.4 How many millilitres?**

How many millilitres are there in:

a) 1 litre 1 000 mL

b) 9 litres 9 000 mL

c) 5 litres 5 000 mL

d) $7\frac{1}{2}$ litres 7 500 mL

e) $2\frac{1}{2}$ litres 2 500 mL

f) 13 litres 13 000 mL

Activity 4: Working with millilitres and litres**4.1 Reading measurements**

Read the scales on each jug and write down how much liquid is held in each.

a)



$1\frac{1}{2}$ L or 1 L 500 mL

b)



$\frac{3}{4}$ L or 750 mL

c)



$1\frac{3}{4}$ L or 1 L 750 mL

4.2 Fill them up

Colour in the jug to show the following millilitre measures.

a)



200 mL

b)



550 mL

c)



50 mL

4.3 Less than one litre

a)



800 mL

b)



100 mL

c)



450 mL

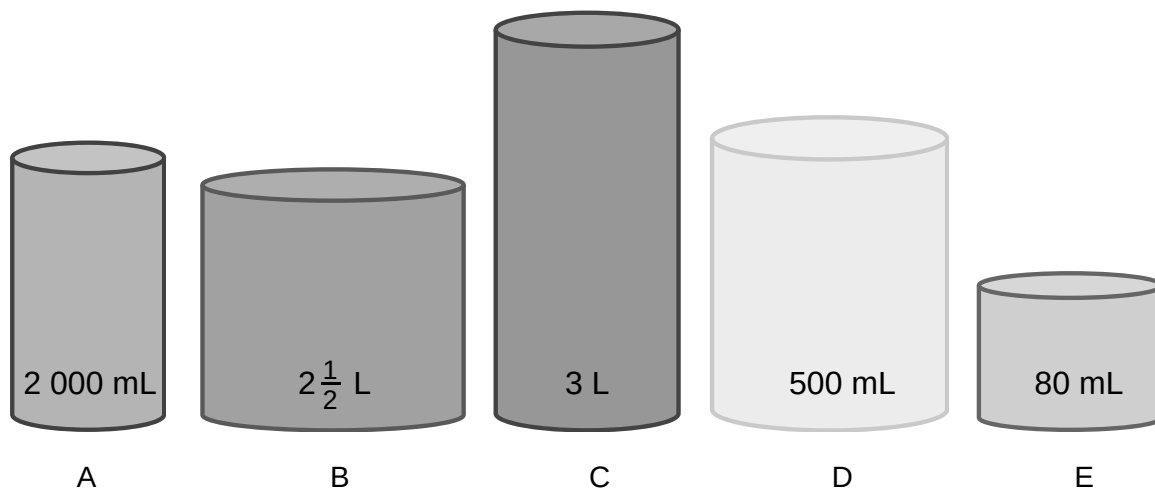
d)



950 mL

4.4 Place measurements in order

a) Place these measurements in order from the least to the greatest.



least

greatest

80 mL	500 mL	2 000 mL	$2\frac{1}{2}$ L	3 L
-------	--------	----------	------------------	-----

- b) Which container holds the most water? Container C
- c) Which container holds the least water? Container E
- d) Which container holds more water than D but less than B? Container A
- e) Which containers hold more water than A? Containers B and C
- f) Which container holds less water than D? Container E
- g) How much water would be needed to fill both containers B and E? 2 580 mL

Day 10**Number and Capacity****4.5 Match up**

Match each container to the most appropriate capacity by ruling lines.

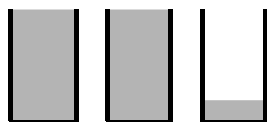
1 litre	7 litres	50 mL	250 mL	150 litres
				
bathtub	coffee cup	bucket	water bottle	eggcup

Lines connect the capacities to the containers as follows: 1 litre to bathtub, 7 litres to bucket, 50 mL to coffee cup, 250 mL to water bottle, and 150 litres to eggcup.

4.6 Not quite a whole

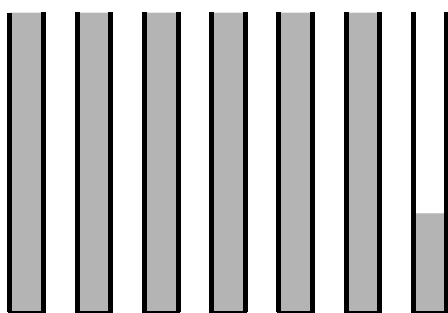
Sometimes the capacity of an object is not a whole number answer. Think of interesting, but reasonable, ways to describe the following capacities.

a)



This capacity is two cups and a little bit more or just over two cups.

b)

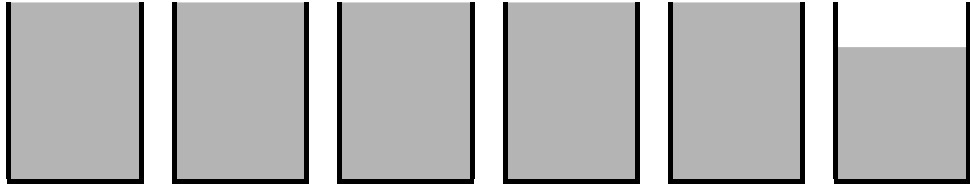


This capacity is six and a bit more cups or almost six and a half cups.

Number and Capacity

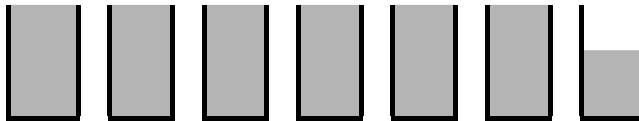
Day 10

c)



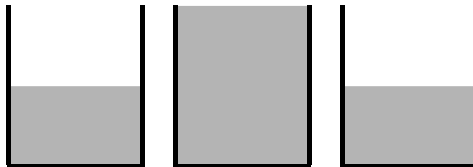
This capacity is almost six cups or five and three-quarter cups or a little bit less than six cups.

d)



This capacity is about six and a half cups or a little more than six and a half cups.

e)



This capacity is two cups or one full cup and two half cups.



Tutor instructions

After the student has completed Day 10 there is a reflection checklist in the Activity Book to be completed by the student and the tutor.

Overview and Outline

Number and Capacity

Overview

Set 7: Number and Capacity

Early Childhood Mathematics – Year 3

Australian Curriculum		
Number and Algebra	Measurement and Geometry	Statistics and Probability

Teaching focus

Australian Curriculum	Day									
	1	2	3	4	5	6	7	8	9	10
Number and Algebra										
Number and place value										
Recall multiplication facts of two, three, five and ten and related division facts (ACMNA056)										
• establishing multiplication facts using number sequences										
Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies (ACMNA057)										
• writing simple word problems in numerical form and vice versa										
• using a calculator to check the solution and reasonableness of the answer										
Measurement and Geometry										
Using units of measurement										
Measure, order and compare objects using familiar metric units of length, mass and capacity (ACMMG061)										
• recognising and using centimetres and metres, grams and kilograms, and millilitres and litres										
• recognising the importance of using common units of measurement										

Number and Capacity

Overview and Outline

Australian Curriculum

- recognising that metric units are not the only units used throughout the world, for example measuring the area of floor space using tatami mats (Japan), using squares for room and house area (Australia) and miles for distance (Britain, USA)

Day									
1	2	3	4	5	6	7	8	9	10

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Outline

Set 7: Number and Capacity

Early Childhood Mathematics – Year 3

Total notional hours: 10

Overview and Outline

Number and Capacity

Australian Curriculum	K-10 Syllabus Scope and Sequence
Content strand: Number and Algebra Sub-strand: Number and place value Recall multiplication facts of two, three, five and ten and related division facts (ACMNA056)	Students will be: • establishing multiplication facts using number sequences • understanding that multiplication of objects can be described using everyday language (eg groups of, shared, lots of) • recognising that the symbol ($\times$) is used to represent the operation of multiplication • using skip counting to see how it relates to multiplication • using multiplication facts for two times (doubles) up to 2×10 (eg discover the two times facts using materials; record in a two-way table; practise) • discovering, learning and revising multiplication facts for 3, 4, 5 and 10 times • understanding that multiplication can be used for situations involving repeating equal quantities (eg 'Mangoes are \$3 each, how much does it cost for 6 mangoes?' can be written as repeated addition or multiplication) • using rows and columns in arrays to represent the number of groups and the number of objects in each group (eg six rows of three represents six groups with three in each group) • understanding that collections may be arranged into equal-sized groups (eg students arrange 16 blocks into arrays: 8 rows of 2, 2 rows of 8, 1 row of 16, 16 rows of 1 and 4 rows of 4).

Number and Capacity

Overview and Outline

Australian Curriculum	K-10 Syllabus Scope and Sequence
Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies (ACMNA057)	Students will be: • writing simple word problems in numerical form and vice versa • writing sensible multiplication story problems to match given number sentences (eg for $5 \times 8 = \boxed{?}$ write 'Amy bought five bunches of flowers with eight flowers in each bunch. How many flowers did she buy?') • explaining, discussing and comparing methods for solving multiplication problems • using a calculator to check the solution and reasonableness of the answer • using the constant function on a calculator to solve repeated addition problems • understanding that calculators can assist in the exploration and development of mental computation strategies and for single operations involving two-digit and three-digit numbers.

Overview and Outline

Number and Capacity

Australian Curriculum	K-10 Syllabus Scope and Sequence
Content strand: Measurement and Geometry Sub-strand: Using units of measure Measure, order and compare objects using familiar metric units of length, mass and capacity (ACMMG061)	Students will be: • recognising and using centimetres and metres, grams and kilograms, and millilitres and litres • using and responding to the appropriate language of capacity • using and responding to the comparative language of capacity (eg full, empty, holds more, holds less) • choosing an appropriate unit that relates well to the attribute to be measured (eg measure the capacity of a bucket with a jug) • using uniform units (eg use the same-size jar to measure the capacity) • carefully and consistently using the unit chosen to ensure accuracy (eg when measuring capacity, the cups need to be filled to the same level) • using strategies to deal with part units for capacity (eg four and a half cups, 1 litre = 1 000mL so half a litre = 500 mL) • repeating a single unit to measure • understanding the size of something does not change when a different-sized unit is used to measure it, but the number of units taken to match it may change (eg the same amount can be described as 1 L or 1 000 mL) • understanding that non-standard units can be used to measure capacity (eg use cans, cups, jars, blocks) • using the same units when comparing objects (eg to find out the capacity of a two buckets, use a 1 L jug as the unit and count the number needed and compare) • using strategies to directly compare objects by capacity by pouring (eg I know this jar holds more than 1 L because when I poured the 1 L jug into it, it overflowed) • understanding that the same objects can be ordered differently according to different attributes (eg a long glass is taller than a shorter glass, but may not necessarily hold more water than the shorter glass) • using indirect methods to compare objects by capacity (eg use a jug/jar to find which holds more, a can or a bottle of drink) • using a calibrated jug to compare the capacity of other containers (eg use a one litre measuring jug to fill, calibrate and compare the capacity of other containers).

Number and Capacity

Overview and Outline

Australian Curriculum	K-10 Syllabus Scope and Sequence
Content strand: Measurement and Geometry Sub-strand: Using units of measure Measure, order and compare objects using familiar metric units of length, mass and capacity (ACMMG061)	Students will be: • making their own measuring device and reading the scale on this and standard measuring jugs • estimating capacity by look (eg by looking at three containers, decide which will hold the most and which will hold the least) then compare by measuring. • recognising the importance of using common units of measurement • understanding that standard units remain constant and are readily recognised and understood (eg a litre remains constant but the size of the container varies) • understanding that standard (metre, centimetre, litre, kilogram) or non-standard units can be used for comparison of objects/events. • recognising that metric units are not the only units used throughout the world, for example measuring the area of floor space using tatami mats (Japan), using squares for room and house area (Australia) and miles for distance (Britain, USA).



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