GO MATHS

Teacher Sourcebook

Sample Unit

STAGE 3B

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ORIGO EDUCATION

Investigating Capacity, Volume and Mass

UNIT 53

Content Outcomes

MS 3.3 Selects and uses the appropriate unit to estimate and measure volume and capacity, including the volume of rectangular prisms

MS 3.4 Selects and uses the appropriate unit and measuring device to find the mass of objects

Mathematical Background

This unit begins by revising the relationship between units of capacity (litre and millilitre) and students investigate formal strategies to convert between the units. Simple tables, like the example shown below, are used to emphasise that the amount of the attribute does not increase/decrease when a conversion is made. This helps to avoid erroneous rules such as multiply/divide by 1000 or shift the decimal point to convert. Students also work with volume of rectangular prisms, use the notation cm^3 and m^3, and continue to explore the relationship between length, capacity, volume and mass (of water) working with a thousand block and a metre cube.

1000 millilitres is the same as 1 litre

___ mL is the same as ___ L

Lesson Overview

53.1 Working with Units of Capacity

53.2 Adding Mixed Units of Capacity

53.3 Relating Length, Volume and Mass

53.4 Using the cm^3 Notation

53.5 Working with Volume

Investigation: Does the area of the front face of a cereal box always increase if the volume of the box increases?

Language

Students will use and develop the following language:
millilitre (mL), litre (L), kilolitre (kL), capacity, cubic centimetre (cm^3), cubic decimetre (dm^3), cubic metre (m^3), volume, gram (g), kilogram (kg), tonne (t), mass, length, width, height, dimensions

Sequence of related units for Stage 3

	Stage 3A	Stage 3B
MS 3.3	2 12 15 21	44 53
MS 3.4	2 12 18 21	44 53 57

UNIT 53 Assessment

Content Indicators

On completion of this unit, the students should be able to

MS 3.3
- **A** solve problems involving capacity and express the solutions in millilitres (mL) and litres (L)
- **B** convert between units of capacity
- **C** calculate the volume of a rectangular prism in cubic centimetres and express it using the correct notation (cm^3)

MS 3.4
- **D** convert between units of mass

Techniques

The following tools can be used to assess the content indicators.

1. Investigation C

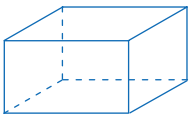
The Investigation is located after Lesson 5.

2. Written Test A B C D

Allow time for the students to complete the written test for Unit 53. See page 21 of the *GO Check* assessment book. Consider administering the test one or two weeks after completion of the unit.

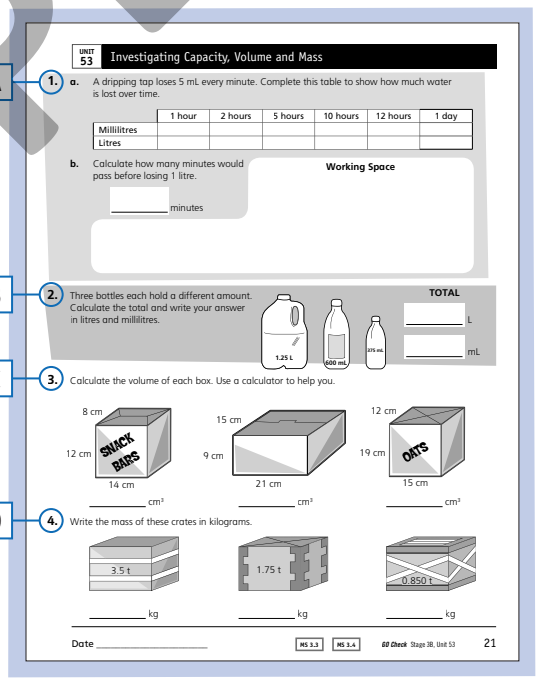
3. Diagnostic Probe C

Show the student the picture of the box shown below.



Explain to the student that the dimensions of the box are 12 cm, 8 cm and 25 cm. Ask the student to label the dimensions and calculate the volume of the box. Then have the student explain how he or she obtained his or her answer.

***GO Check*, page 21**



UNIT 53 Investigating Capacity, Volume and Mass

A — 1. a. A dripping tap loses 5 mL every minute. Complete this table to show how much water is lost over time.

	1 hour	2 hours	5 hours	10 hours	12 hours	1 day
Millilitres						
Litres						

b. Calculate how many minutes would pass before losing 1 litre.

_____ minutes

Working Space

B — 2. Three bottles each hold a different amount. Calculate the total and write your answer in litres and millilitres.

TOTAL _____ L _____ mL

C — 3. Calculate the volume of each box. Use a calculator to help you.

8 cm, 12 cm, 14 cm, SNACK BARS — _____ cm^3

15 cm, 9 cm, 21 cm — _____ cm^3

12 cm, 19 cm, 15 cm, OATS — _____ cm^3

D — 4. Write the mass of these crates in kilograms.

3.5 t — _____ kg

1.75 t — _____ kg

0.850 t — _____ kg

Date _____ MS 3.3 MS 3.4 *GO Check* Stage 3B, Unit 53 21

Working Mathematically

The processes related to the working mathematically outcomes are embedded in all *GO Maths* activities. The following pointers should help you assess the students' demonstration of these processes.

Questioning (WMS 3.1)	*Listen* to the questions students pose as they calculate the volume of rectangular prisms, e.g. 'Should I change the order of the factors?'.
Applying Strategies (WMS 3.2)	*Observe* the strategies students use to figure out the volume of rectangular prisms: do they use efficient mental strategies?
Communicating (WMS 3.3)	*Note* students' explanations of their mental strategies for finding the volumes of rectangular prisms: are they clear and logical?
Reasoning (WMS 3.4)	*Listen* as students explain how to convert from one unit of measurement to another.
Reflecting (WMS 3.5)	*Note* students who recognise the connections between units of measure, e.g. 1m^3 holds 1000 L of water that has a mass of 1 t.

Recording

Content

Record achievement of the content indicators in the box(es) for this unit alongside the relevant outcome(s) in the Progress Record. This can be found on page v of each student's *GO Check* assessment book. Alternatively, enter results into the *GO Chart Electronic Progress Record*.

	Stage 3A	Stage 3B
MS 3.3	2 12 15 21	44 53
MS 3.4	2 12 18 21	44 53 57

Working Mathematically

Record significant observations in the Progress Record on page vi of each student's *GO Check* assessment book. Alternatively, enter more detailed notes into the *GO Chart Electronic Progress Record*.

Intervention

For students who need extra assistance, revisit the relevant parts of this unit or check for suitable activities from the Related Classroom Resources section in the back of this sourcebook.

53.1 Working with Units of Capacity

Materials

- *GO Maths* student journal, page 97
- 1 teaspoon for each group of students
- 1 small (less than 400 mL) container with the labels removed for each group of students
- Access to water
- Calculator for each pair of students

Daily Computation Practice

Write the following number sentences on the board. Have the students copy and complete them or simply write the answers.

17.2 + 1.95 = ___
6.7 + 15.25 = ___
21.8 + 3.45 = ___
2.7 + 8.75 = ___
12.4 + 13.85 = ___
9.25 + 18.4 = ___
6.32 + 4.95 = ___
7.45 + 5.81 = ___
6.25 + 2.65 = ___
3.68 + 19 = ___

In this lesson, students explore the relationship between millilitres and one litre.

Daily Number Sense

Have the students work independently to figure out different dimensions of rectangles with a perimeter of 3.6 m. Encourage them to write dimensions with a different number of decimal places. As the students give the possible dimensions of each rectangle, ask: *What is the difference between the length and width? How do you know?* Encourage the students to describe their thinking.

Activity

1. Ask: *How much do you think one teaspoon holds? What unit will we use to describe the amount? What fraction of a litre does one teaspoon hold?* Encourage suggestions and then explain that a standard teaspoon holds (for all practical purposes) 5 mL. (*Note:* The exact capacity of one teaspoon is 4.929 mL.)
2. Direct the students into groups and give each group a teaspoon and a container. Ask each group to show their container to the whole class. Have all the students give estimates for what they think each container will hold and write them on the board. The groups then fill their containers with water using the teaspoons, tally the number of teaspoons used and use the information in the chart below to figure out the capacity of their container.

1 teaspoon holds 5 millilitres
so
____ teaspoons holds _____ millilitres

3. Have the groups report their findings. Ask: *What is the capacity of your container in litres?* Write the chart shown below on the board and invite individuals to say how they can use it to describe the amount in each container in litres.

1 millilitre is the same as 0.001 litre
so
____ mL is the same as _____ L

4. Discuss the different tasks on page 97 of the *GO Maths* student journal. If necessary, review the relationship between units of time. Then have the students work with a partner to complete the page, using a calculator as required. If they are not sure about any question, encourage them to move on to other questions.

Reflection

Review the students' answers to page 97 of the *GO Maths* student journal and discuss strategies to complete questions that were challenging. Ask: *Why do you think the graph levelled out and then rose? How did you decide which tap was losing water at a faster rate?*

Adding Mixed Units of Capacity

53.2

In this lesson, students work with litres and millilitres to reinforce the concept that measurement units must be the same before they can be combined.

Daily Number Sense

On the board, write ***7.5 kg*** and say: *This is the combined mass of two packages. What could be the mass of each package? What is the difference between the masses of the two packages?* Encourage the students to work independently to write masses with a different number of decimal places or use grams. They then describe how they can figure out the differences.

Activity

1. Show the class two of the smaller measuring jugs with a combined capacity of more than one litre. Ask: *If we filled each of these containers with water and then poured both into a larger container, what would be the combined capacity? How do you know? Is there more than one way to describe the total capacity?* Invite volunteers to figure out the exact answer and write the capacity in millilitres and fractions of a litre on the board.
2. Repeat for other combinations of two or three containers. Discuss combining amounts in large containers (litres) with small containers (millilitres) and reinforce the concept that the units need to be the same when the totals are figured out. Invite individuals to explain how they would make the conversion, e.g. 'every litre is the same as 1000 millilitres' or '125 millilitres is the same as 0.125 litres' and so on. On the board, draw the diagram shown below and write ***125 mL*** in the first space. Ask: *How did the number of millilitres change? How should '1 litre' change?* (125 is one-eighth of 1000.)

1000 millimetres is the same as 1 litre
___ mL is the same as ___ L

3. Discuss the examples at the top of page 98 of the *GO Maths* student journal and complete Question 1. Then have the students work independently (or with a partner if appropriate) to complete the page.

Reflection

Discuss the students' answers to page 98 of the *GO Maths* student journal. Ask questions such as: *When you convert a number in litres to a number in millilitres, does the overall capacity change? What does change? Why does the number change?* Reinforce the fact that a container is not bigger when its capacity is converted from litres to millilitres — just that more of the smaller units are required.

Materials

- *GO Maths* student journal, page 98
- 2 or 3 large measuring jugs marked in litres
- 2 or 3 small measuring jugs marked in millilitres

Daily Computation Practice

Write the following number sentences on the board. Have the students copy and complete them or simply write the answers.

9.45 – 7.8 = ___
4.8 – 9.75 = ___
12.65 – 7.8 = ___
14.2 – 9.85 = ___
12.15 – 2.3 = ___
20.35 – 17.9 = ___
22.25 – 18.9 = ___
10.25 – 8.95 = ___
6.55 – 2.9 = ___
11.2 – 8.75 = ___
10.2 – 7.85 = ___
12.6 – 2.8 = ___

53.3 Relating Length, Volume and Mass

Materials

- *GO Maths* student journal, page 99
- 10 × base-10 thousand blocks (if available)
- 12 × metre sticks

Daily Computation Practice

Write the following number sentences on the board. Have the students copy and complete them or simply write the answers.

8.7 + 8.65 = ___
9.45 – 7.8 = ___
13.25 – 7.4 = ___
4.6 + 19.85 = ___
12.15 – 8.75 = ___
20.8 + 6.4 = ___
7.85 + 19.4 = ___
8.2 – 1.65 = ___
6.5 + 12.8 = ___
20.25 – 17.4 = ___
6.85 + 8.25 = ___
19.62 – 12.8 = ___

Extension

Have the students estimate the amount of water in large containers, such as a local swimming pool.

The metric system was created to link the attributes of length, volume, capacity and mass in a meaningful way. In this lesson, students investigate those links.

Daily Number Sense

Repeat the Daily Number Sense discussion from the previous lesson for two containers with a combined capacity of ***2.75 L***.

Activity

1. Show the students one of the base-10 thousand blocks and ask them to describe its dimensions. Record the information on the board (e.g. 10 cm by 10 cm by 10 cm). Also bring out the fact that 0.1 m by 0.1 m by 0.1 m can be used for the dimensions and that in the metric system, the block can also be described as 1 decimetre (dm) by 1 dm by 1 dm.
2. Say: *Imagine the thousands block was an empty container. How much water would it hold? What would be the mass of the water?* Ask volunteers to give as many facts as they can recall or figure out about the amount of water in the block. On the board, draw a table like the example shown below and write the information in the first row.

Dimensions		Volume		Capacity		Mass	
1 dm × 1 dm × 1 dm	10 cm × 10 cm × 10 cm	1 dm^3	1000 cm^3	1 L	1000 mL	1 kg	1000 g
1 dm × 1 dm × 10 dm	10 cm × 10 cm × 100 cm	10 dm^3	10 000 cm^3	10 L	10 000 mL	10 kg	10 000 g

3. Use the thousand blocks to build a stack of 10 blocks (or draw a picture on the board close to actual size). Work with the class to complete the second row of the table. Encourage them to use the fact that there are 10 blocks in the stack to explain that the volume, capacity and mass increase '× 10'.
4. Repeat for a 'slab' of 100 thousand blocks to complete the third row of the table.
5. Have volunteers hold the metre sticks to show the outline of 1 m^3 and discuss the dimensions. Then have the students complete Question 1 on page 99 of the *GO Maths* student journal.
6. Have the students work with a partner to complete page 99 of the *GO Maths* student journal. Encourage them to use mental strategies.

Reflection

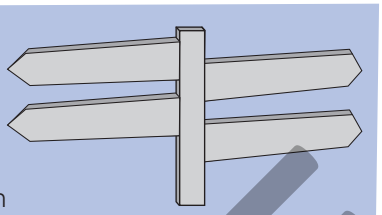
Ask the students to describe the thinking they used to figure out the answers to Question 2 on page 99 of the *GO Maths* student journal.

Using the cm³ Notation

53.4

In this lesson, students use base-10 ones blocks to build rectangular prisms, describe the dimensions of the prisms and figure out the total number of blocks used. They use cm^3 to describe the total number of blocks.

Daily Number Sense



On the board, draw a sign (as shown on the right) to show distances to different destinations on walking trails in a park. Ask volunteers to give four distances in metres or fractions of a kilometre. Encourage them to use numbers such as 1.2 km and 850 m, which have differing numbers of decimal places. Invite students to use the data to create addition and subtraction problems and discuss how they will figure out the totals or differences.

Activity

1. Have the students describe the picture at the top of page 100 of the *GO Maths* student journal and complete Question 1, using base-10 ones blocks as required.
2. Ask: *What steps did you use to figure out the total number of blocks?* Bring out different solution strategies, such as: 'There are six blocks on the front face and five slices like the front face, so that makes 30 blocks' or 'Each layer has 10 blocks and there are three layers so that is 30 blocks'. Explain that we need to be more precise than just saying or writing 'blocks'. Write the expression below on the board and explain that each block has dimensions 1 cm by 1 cm by 1 cm along each edge so we can write:

   1 cm by 1 cm by 1 cm = 1 cubic centimetre = 1 cm^3

   Encourage the students to figure out that 30 cubic centimetres can be written as 30 cm^3.
3. Ask the students to use the generalisation above to complete Question 2. After checking their answers, ask them to work independently to complete the page, using base-10 ones blocks as required.

Reflection

1. Discuss the students' answers to page 100 of the *GO Maths* student journal. Encourage individuals to describe the rules they used to figure out the volume of each rectangular prism in Question 3.
2. Discuss one of the examples in Question 4 and have students describe how they figured out the dimensions.

Materials

- *GO Maths* student journal, page 100
- *GO Maths* student journal, Tear Out 5, page 161
- *GO Figure* computation practice book, page 41
- Base-10 ones blocks
- Scissors and sticky tape for each group of students

Daily Computation Practice

Have the students complete page 41 of the *GO Figure* computation practice book.

Consolidation

In preparation for the next lesson, have the students move into groups and ask them to use the grid paper from Tear Out 5 to draw a net of an open rectangular prism with a base of less than 20 cm^2. They draw the rectangular base first and then draw four rectangles along each edge to form the sides of the prism. They then cut out the net, fold up the sides and tape the box together to form an open prism.

53.5 Working with Volume

Materials

- *GO Maths* student journal, page 101
- *GO Figure* computation practice book, page 42
- Open prisms made in the Consolidation activity in the previous lesson
- Base-10 ones blocks
- 1 calculator for each student

Daily Computation Practice

Have the students complete page 42 of the *GO Figure* computation practice book.

Consolidation

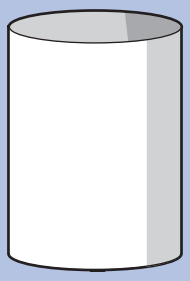
1. Ask the students to identify the open prisms they built that have the same volume but different dimensions.
2. Have the students arrange the open prisms in order from greatest to least volume.

Extension

Challenge the students to measure the dimensions of small boxes at school or from home (to the nearest centimetre) to find a box that has a volume close to 1000 cm^3.

In this lesson, students begin to formalise a rule that uses the area of the base and the height to calculate the number of base-10 ones blocks that occupy the space inside a rectangular prism.

Daily Number Sense



On the board, draw four copies of the container shown on the right. Invite volunteers to shade the containers to show different levels of water and write the amounts, such as 1.25 L and 125 mL. Then invite students to use the data to create addition and subtraction problems and discuss how they can figure out the totals or differences.

Activity

1. Direct the students into their groups from the previous lesson. Have them figure out the number of blocks that will occupy the space inside the open prisms they made and record the volume. They then work with the prisms from other class members. (They can use the base-10 ones blocks as required.)
2. Ask questions that relate to the area of the base of the students' prisms, such as: *Which prisms have a base with an area of 16 square centimetres? What are the volumes of these prisms? Why do the volumes vary? Which prisms have a base with an area of 20 square centimetres? How did you figure out the volume?* Bring out the fact that the area of the base describes the number of blocks in the first layer of the blocks used to fill the prism.
3. Discuss the volume of the students' prisms, asking questions such as: *Which prism has the greatest volume? What are the dimensions of that prism? What face did you (can you) use for the base? How did you figure out the volume?* Encourage the students to explain that any one of the three faces can be used as a base and using one particular face as the base might be easier than the other faces.
4. Have the students work independently to complete page 101 of the *GO Maths* student journal.

Reflection

Discuss the students' answers to page 101 of the *GO Maths* student journal. Ask the students to explain the steps they used to figure out the dimensions of the box shapes in Questions 2 to 4. Reinforce the use of a multiplication rule that relates to the three dimensions of the rectangular prisms.

Investigation

Does the area of the front face of a cereal box always increase if the volume of the box increases?

Think

- What cereal boxes can we consider using in this Investigation?
- When we look at a cereal box, how do we figure out the volume?
- Will drawing diagrams of the boxes help figure out the number of centimetre cubes we can fit into each box?
- How many dimensions do we need to find the measurements for a 3D box?
- How will we find the area of the front face of each box?
- How many dimensions do we need to find the measurements of a 2D face of a box?

Show and Do

Make an overhead transparency of this page. Reveal and read the Investigation question with the students. Encourage them to ask questions to clarify the task. If necessary, discuss the 'Think' prompts.

Observe

Was the student able to

- measure the dimensions of a cereal box?
- figure out the area of the front face of a cereal box using square centimetre grids?
- figure out the volume of a rectangular prism by relating to layers?
- compare boxes that look similar by using measurement information?

Reflect

Discuss the difference between finding volume and area, focusing on the relationship between 2D and 3D. List the measurements found for different boxes in a table. Look for boxes that have the same or similar volumes and then compare their surface areas and use the information to answer the Investigation question. Discuss any interesting data found (such as different boxes that have similar measurements) and compare the actual boxes for a visual comparison.

53 ANSWERS

Student Journal, page 97 **53.1**

Working with Units of Capacity

OUTCOME MS 3.3

1. A dripping tap loses 1 millilitre every minute. Complete the table to show how much water is lost over time.

	1 hour	2 hours	5 hours	10 hours	20 hours	1 day
Millilitres	60	120	300	600	1 200	1 440
Litres	0.06	0.12	0.3	0.6	1.2	1.44

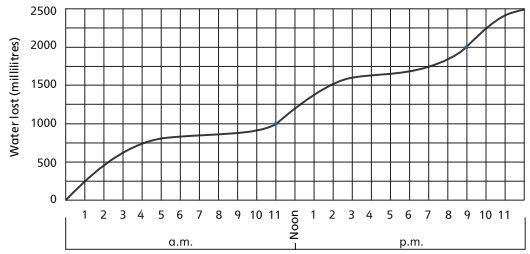
2. **a.** Calculate how many minutes would pass before losing 1 litre. 1 000

b. Write the same time in hours and minutes. 16 hours and 40 minutes

3. About how much water is lost in

a. 1 week? 10.08 litres **b.** 30 days? 43.2 litres **c.** 1 year? 525.6 litres

4. This graph shows data from a different tap.



a. At what time had 1 litre of water been lost? 11 a.m.

b. How much longer did it take to lose the first litre than the second litre? 1 hour

5. Loop the tap that loses water at a faster rate. first tap second tap

GO Maths Stage 3B Unit 53.1 How much water will the second tap lose in one year? 97

Student Journal, page 98 **53.2**

Adding Mixed Units of Capacity

OUTCOME MS 3.3

These students each had three different bottles of water.

Clay		Bree		Monica		Josh	
A	2 L	A	375 mL	A	1.25 L	A	1 L
B	450 mL	B	1.5 L	B	250 mL	B	700 mL
C	1.2 L	C	600 mL	C	3 L	C	2.5 L
Total	?	Total	?	Total	?	Total	?

***1.** What do the students need to do before they can calculate their total amount of water?

They need to convert each bottle to the same unit of measure.

2. Figure out the total amount of water that each student has. Write your answers in litres and millilitres.

Clay	Bree	Monica	Josh
3.65 L	2.475 L	4.5 L	4.2 L
3650 mL	2475 mL	4500 mL	4200 mL

*

3. Who had the greatest amount of water? Monica

4. Who had the least amount of water? Bree

5. Whose total amount was closest to

a. $3\frac{1}{2}$ litres? Clay **b.** $4\frac{1}{4}$ litres? Josh

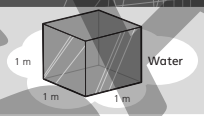
98 Draw a ✔ on the student totals that you could figure out mentally. GO Maths Stage 3B Unit 53.2

Student Journal, page 99 **53.3**

Relating Length, Volume and Mass

OUTCOMES MS 3.3 MS 3.4

1. Imagine this container was filled with water.



One cubic metre of water is equivalent to:

	Volume	Capacity	Mass
a.	1 m³	1 kL	1 t
b.	1 000 dm³	1 000 L	1 000 kg
c.	1 000 000 cm³	1 000 000 mL	1 000 000 g

2. Use the dimensions to calculate the volume, capacity and mass of water in each tank.

	Dimensions (m)			Volume (m³)	Capacity (L)	Mass (kg)
	Width	Length	Height			
Tank A	4	3	2	24	24 000	24 000
Tank B	2	3	2	12	12 000	12 000
Tank C	2	6	4	48	48 000	48 000
Tank D	1	1	0.5	0.5	500	500
Tank E	1	1	0.25	0.25	250	250
Tank F	0.5	0.5	1	0.25	250	250

***3.** Complete the table.

	Dimensions (m)			Volume (m³)	Capacity (kL)	Mass (t)
	Width	Length	Height			
Tank A	2	4	8	64	64	64
Tank B	3	2	5	30	30	30
Tank C	6	0.5	4	12	12	12
Tank D	1	0.25	20	5	5	5

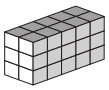
GO Maths Stage 3B Unit 53.3 Imagine a container that held 1 kL of water. If the base was 250 cm², how tall would it be? 99

Student Journal, page 100 **53.4**

Using the cm³ Notation

OUTCOME MS 3.3

1. **a.** Imagine you built this shape with base-10 ones blocks. Complete the table.



Length	Width	Height	Total number of blocks
5 blocks	2 blocks	3 blocks	30 blocks

b. Write the volume of the shape. 30 cm³

2. Here are the dimensions of another box shape.

Length = 8 cm Width = 3 cm Height = 5 cm

Write how you can calculate the volume without counting blocks.

Multiply the length x width x height (V = L x W x H)

3. Use your rule above to calculate the volume of these shapes.

	Length	Width	Height	Volume
a.	5 cm	4 cm	3 cm	60 cm³
b.	9 cm	6 cm	4 cm	216 cm³
c.	7 cm	5 cm	5 cm	175 cm³
d.	6 cm	7 cm	3 cm	126 cm³

***4.** Write the dimensions of some different box shapes that have the same volume. Use blocks to help.

Volume = 36 cm³

	Length	Width	Height
a.	9 cm	2 cm	2 cm
b.	6 cm	2 cm	3 cm
c.	4 cm	3 cm	3 cm
d.	12 cm	3 cm	1 cm

Volume = 64 cm³

	Length	Width	Height
e.	8 cm	4 cm	2 cm
f.	4 cm	4 cm	4 cm
g.	8 cm	8 cm	1 cm
h.	16 cm	2 cm	2 cm

100 Write the dimensions of another box shape that has the same volume as 4 cm × 8 cm × 10 cm. GO Maths Stage 3B Unit 53.4

* Answers will vary. This is one example.

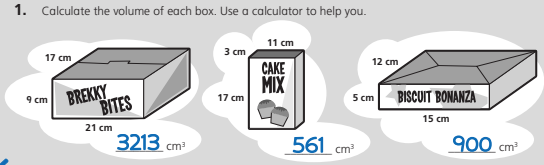
ANSWERS 53

Student Journal, page 101 **53.5**

Working with Volume

OUTCOME MS 3.3

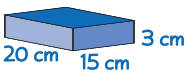
1. Calculate the volume of each box. Use a calculator to help you.



3213 cm³ 561 cm³ 900 cm³

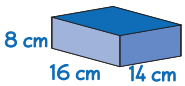
***2.** Draw and label the dimensions of a box that has a volume less than 1000 cm³ and another box that has a volume of more than 1000 cm³. Then calculate the volume of each.

a. Less than 1000 cm³



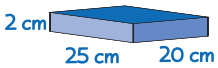
Volume = 900 cm³

b. More than 1000 cm³



Volume = 1792 cm³

***3.** Draw and label the dimensions of a box that has a volume as close to 1000 cm³ as possible. Make each dimension different.



***4.** Imagine boxes that fit these categories. List their dimensions and calculate their exact volume.

a.

Less than 1000 cm³	
Dimensions	Volume

b.

More than 1000 cm³	
Dimensions	Volume

Imagine the boxes in Question 4 could hold water. Write the capacities in litres.

GO Figure, page 41

GOLD MEDALS

What does every winner lose in a triathlon?

Figure out each of these and write the answer. Then find each answer in the grid below and cross out the letter above. Write the remaining letters at the bottom of the page.

1.62 + 9.3 = 10.92	8 – 1.67 = 6.33	3.7 + 2.42 = 6.12
2.31 – 1.64 = 0.67	1.7 + 2.96 = 4.66	3.45 – 0.7 = 2.75
2.58 + 0.9 = 3.48	1.24 – 0.38 = 0.86	6.9 + 1.37 = 8.27
2.96 – 0.7 = 2.26	1.53 + 7.2 = 8.73	7.7 – 2.99 = 4.71
5.91 + 1.2 = 7.11	3.02 – 1.5 = 1.52	0.82 + 1.88 = 2.7
1.62 – 0.09 = 1.53	3.08 + 1.07 = 4.15	1.09 – 0.49 = 0.6
4.73 + 1.91 = 6.64	4.73 – 1.91 = 2.82	2.04 + 1.07 = 3.11
2.04 – 1.07 = 0.97	2.8 + 2.17 = 4.97	4.9 – 1.05 = 3.85
2 – 0.95 = 1.05	1.24 + 0.77 = 2.01	5.9 + 1.24 = 7.14
3.75 + 2.35 = 6.1	3.04 – 0.8 = 2.24	

Write the letters in order from the ✻ to the bottom-right corner.

T	~~E~~	~~E~~	~~T~~	H	~~S~~	~~M~~	~~K~~	~~K~~	E
0.84	0.86	7.11	6.64	0.5	0.97	1.53	0.67	4.71	8.53
~~D~~	I	R	~~T~~	B	~~K~~	~~E~~	~~E~~	~~P~~	~~S~~
2.75	2.25	8.29	2.26	6.34	10.92	6.1	1.05	2.24	7.14
R	E	~~G~~	~~D~~	~~L~~	A	~~P~~	~~K~~	~~K~~	~~K~~
0.49	4.98	6.33	3.11	2.7	6.2	4.15	4.97	3.48	0.6
~~S~~	~~H~~	~~K~~	~~R~~	T	~~S~~	H	~~K~~	~~P~~	~~S~~
8.73	2.01	3.85	6.12	5.11	4.66	7.13	8.27	1.52	2.82

T H E I R B R E A T H

GO Figure, page 42

CALENDARS

What is the shortest month of the year?

Figure out each of these and write the answer. Then write each letter above its matching answer at the bottom of the page.

1.75 – 0.8 = 0.95	I	0.81 + 2.7 = 3.51	N
4 – 0.78 = 3.22	E	2.02 + 1.9 = 3.92	E
2.19 – 0.59 = 1.6	S	3.7 + 1.64 = 5.34	T
4.01 – 0.89 = 3.12	Y	7.8 + 1.53 = 9.33	T
6 – 2.41 = 3.59	S	5.52 + 2.48 = 8	H
4.7 – 0.81 = 3.89	T	0.7 + 1.95 = 2.65	R
6.02 – 4.9 = 1.12	A	0.82 + 3.78 = 4.6	E
3.54 – 1.77 = 1.77	A	4.73 + 1.8 = 6.53	Y
5.7 – 1.76 = 3.94	M	4.9 + 1.13 = 6.03	T
7.12 – 2.77 = 4.35	H	2.4 + 4.62 = 7.02	L
6.08 – 1.78 = 4.3	R	5.18 + 1.72 = 6.9	O
7.02 – 0.79 = 6.23	E	4.7 + 0.81 = 5.51	L

M	A	Y	—	I	T	O	N	L	Y	H	A	S
3.94	1.12	6.53		0.95	3.89	6.9	3.51	7.02	3.12	8	1.77	1.6

T	H	R	E	E		
9.33	4.35	2.65	3.92	6.23		

L	E	T	T	E	R	S
5.51	3.22	6.03	5.34	4.6	4.3	3.59

GO Check, page 21

UNIT 53 **Investigating Capacity, Volume and Mass**

1. a. A dripping tap loses 5 mL every minute. Complete this table to show how much water is lost over time.

	1 hour	2 hours	5 hours	10 hours	12 hours	1 day
Millilitres	300	600	1500	3000	3600	7200
Litres	0.3	0.6	1.5	3	3.6	7.2

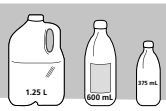
b. Calculate how many minutes would pass before losing 1 litre.

200 minutes

Working Space ✻

5 hours ÷ 3 x 2
5 hours = 5 x 60 mins
= 300 mins
so 300 ÷ 3 x 2 = 100 x 2 = 200 mins

2. Three bottles each hold a different amount. Calculate the total and write your answer in litres and millilitres.

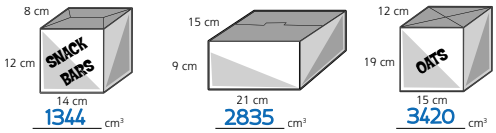


TOTAL

2.225 L

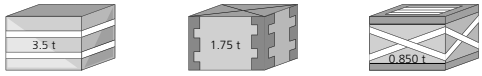
2225 mL

3. Calculate the volume of each box. Use a calculator to help you.



1344 cm³ 2835 cm³ 3420 cm³

4. Write the mass of these crates in kilograms.



3500 kg 1750 kg 850 kg

Date _____

* Answers will vary. This is one example.

UNIT 53 Materials and Resources

53.1 Working with Units of Capacity

Materials
- *GO Maths* student journal, page 97
- 1 teaspoon for each group of students
- 1 small (less than 400 mL) container with the labels removed for each group of students
- Access to water
- Calculator for each pair of students

53.2 Adding Mixed Units of Capacity

Materials
- *GO Maths* student journal, page 98
- 2 or 3 large measuring jugs marked in litres
- 2 or 3 small measuring jugs marked in millilitres

53.3 Relating Length, Volume and Mass

Materials
- *GO Maths* student journal, page 99
- 10 × base-10 thousand blocks (if available)
- 12 × metre sticks

53.4 Using the cm^3 Notation

Materials
- *GO Maths* student journal, page 100
- *GO Maths* student journal, Tear Out 5, page 161
- *GO Figure* computation practice book, page 41
- Base-10 ones blocks
- Scissors and sticky tape for each group of students

53.5 Working with Volume

Materials
- *GO Maths* student journal, page 101
- *GO Figure* computation practice book, page 42
- Open prisms made in the Consolidation activity in the previous lesson
- Base-10 ones blocks
- 1 calculator for each student

Investigation

Materials
- Overhead transparency of the Investigation question and 'Think' prompts
- Collection of various empty cereal boxes

Optional
- Copies of Blackline Master 12