BLOOMSM4TH

Makes Maths Fun

Level 5

VOLUME & CAPACITY

Bloomsmath is a comprehensive mathematics program which provides a fun way for every student to be learning to the best of their ability.

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BLOOMSM4TH Makes Maths Fun

Level 5

Volume & Capacity

Level 5 is designed for students in their fifth year at school often called Year 4. Students will estimate, measure, compare and record volumes and capacities using litres, millilitres and cubic centimetres.

Knowledge: Students will record and order various containers both by capacity and volume.

Students who demonstrate proficiency in this activity move on to Comprehension.

STOP

Students stop here as they require additional teacher support to master this activity.

Comprehension: Students will perform various conversions such as tablespoons to cups and teaspoons to millilitres.

Students who demonstrate proficiency in this activity move on to Application.

STOP

Students stop here if time has run out or they require additional support with this activity.

Application: Students will use various conversions to solve a riddle.

Students who demonstrate proficiency in this activity move on to Analysis.

STOP

Students stop here if time has run out or they require additional support with this activity.

Analysis: Students will convert a recipe for 10 cookies into a recipe for 30 cookies.

Students who demonstrate proficiency in this activity move on to Synthesis.

STOP

Students stop here if time has run out or they require additional support with this activity.

Synthesis: Students will convert a simple recipe from volume to weight.

Evaluation: Suggested questions provide a starting point for discussions related to Volume and Capacity.

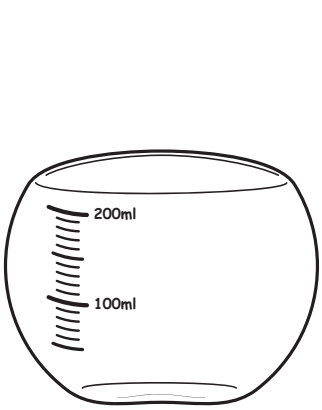
Students may complete more or fewer activities for each learning outcome depending on the time allocated and their strength in the area being covered.

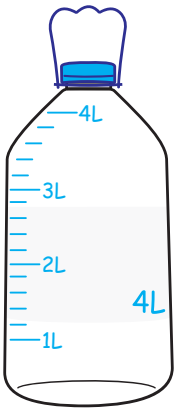
All students should participate in the Evaluation discussion to encourage the use of mathematical language, logical reasoning and reflection on that which they have completed.

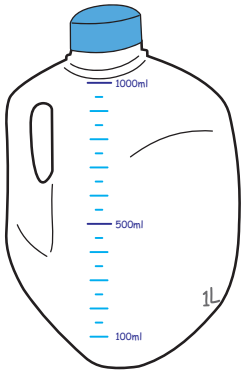
Name: _____

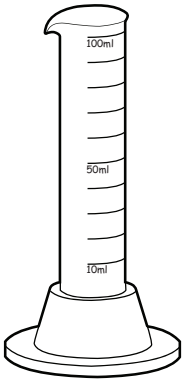
Knowledge

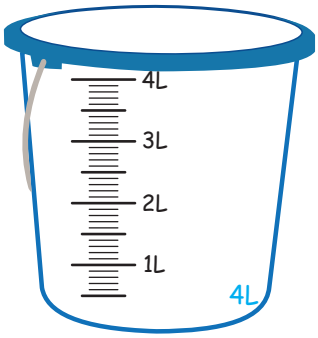
Record the capacity of each container below in order from smallest (container 4) to largest (containers 2 and 5). Be careful as some of the containers have the same capacity.

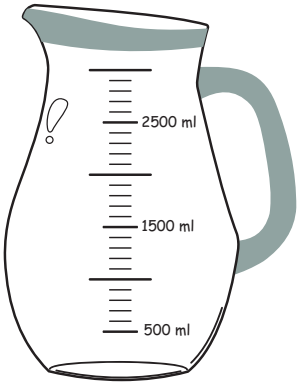


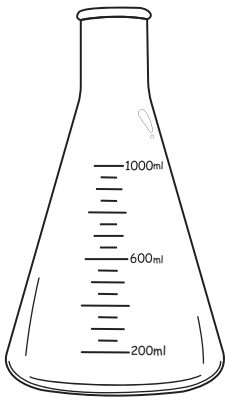


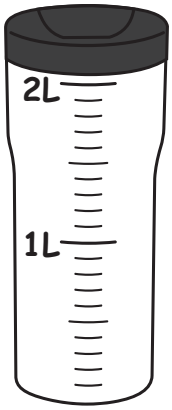












Largest → Smallest

Now colour each container to the amount requested and order the containers based on their volume. Be careful as you may need to convert the measurement before using them.

1. 0.5L
2. 2600mL
3. 500mL
4. 0.06L
5. 2500mL
6. 1.75L
7. 0.8L
8. 1500mL

Let's Try This Again Progress To Comprehension

Name: _____

Comprehension

You will need:

- Rice
- Water
- 1 Teaspoon
- 1 Tablespoon
- 1 Cup
- 20ml Medicine Cup
- Marked Measuring Cup

Estimate and then use the rice and water to convert and measure each quantity below. Be sure to dry the items between the water and rice measurements.

Measurement Conversion	Estimate	Water	Rice
Teaspoons from 1 tablespoon			
Teaspoons from 1 cup			
Tablespoons from 1 cup			
Volume of 1 teaspoon in millilitres			
Volume of 1 tablespoon in millilitres			
Volume of 1 cup in millilitres			
Volume of 4 cups in millilitres			
Volume of 4 cups in litres			

Name: _____

Application

Use the table below to perform the following conversions to find out: **Why the math book was sad?**

1 Tablespoon	1/20 Cup
1 Cup	250 Millilitres
1 Tablespoon	3 Teaspoons
1 teaspoon	5 Millilitres
1 Tablespoon	15 Millilitres

Tablespoons in 7/20 cups	•	• 1	U
Cups from 500 millilitres	•	• 3	E
Tablespoons from 45 millilitres	•	• 0.5	I
Tablespoons from 15 teaspoons	•	• 10	P
Cups from 20 tablespoons	•	• 0.3	H
Teaspoons from 30 millilitres	•	• 6	S
Cups from 125 millilitres	•	• 250	N
Tablespoons from 15/20 cups	•	• 9	D
Litres from 1 cup	•	• 11	Y
Teaspoons from 45 millilitres	•	• 7	A
Tablespoons from 12 teaspoons	•	• 8	M
Cups from 2 Litres	•	• 12	R
Millilitres from 20 Tablespoons ?	•	• 5	C
Tablespoons from 33 teaspoons	•	• 750	L
Teaspoons from 50 millilitres	•	• 15	T
Tablespoons from 6/10 cup	•	• 2	B
Millilitres in 3 cups	•	• 4	O

2	3	5	7	1	6	3

0.5	15

0.3	7	9

6	4

8	7	250	11

10	12	4	2	750	3	8	6

Let's Try This Again

Progress To Analysis

Name: _____

Analysis

Choco-Chip Biscuit Recipe

The following recipe will make 10 standard biscuits. See if you can convert each ingredient to make enough cookies for a class of 30 students.

Ingredients (for 10 biscuits):

- $\frac{1}{4}$ cup butter, softened
- $\frac{1}{2}$ cup white sugar
- $\frac{1}{4}$ cup packed brown sugar
- 1 egg
- $\frac{3}{4}$ teaspoon vanilla extract
- $1\frac{1}{4}$ cups all-purpose flour
- $\frac{1}{2}$ teaspoon baking soda
- $\frac{3}{4}$ teaspoon hot water
- $\frac{1}{4}$ teaspoon salt
- $\frac{1}{8}$ cup semisweet chocolate chips
- 1 tablespoon chopped walnuts

New Ingredients Required:

- _____cup butter, softened
- _____cup white sugar
- _____cup packed brown sugar
- _____eggs (round to the nearest whole egg)
- _____teaspoons vanilla extract
- _____cups all-purpose flour
- _____teaspoons baking soda
- _____teaspoons hot water
- _____teaspoons salt
- _____ cup semisweet chocolate chips
- _____ tablespoon chopped walnuts

Name: _____

Synthesis

When cooking with mixing machines which can weigh, cook and knead in one machine all items are added by weight not by volume. As an example 120ml of water is added as 120g of water and weighed by the scales or instead of asking for 1 carrot the recipe will require 60g of carrot.

Convert the carrot cake smoothie recipe below from volume to weight. You will need all the ingredients and a set of scales to complete this activity. If you have a blender you can make it into a milkshake for the class to taste – leave out the walnuts if anyone is allergic to these.

Recipe by Volume	Recipe by Weight
1 ripe banana	
1 large carrots chopped	
250ml milk	
$\frac{1}{2}$ cup yogurt	
$\frac{1}{4}$ cup walnuts	
1 teaspoon cinnamon	
1 teaspoon vanilla	
$\frac{1}{4}$ teaspoon freshly grated ginger	
Dash of nutmeg	

Evaluation

The following questions and activities are provided as a starting point for fun discussions related to Volume and Capacity. During these conversations students will have an opportunity to use appropriate mathematical language in its correct context, to engage in reflection on the Volume and Capacity activities they have completed and to use logical reasoning to tie their in-class mathematics to its everyday context.

What is the difference between volume and capacity and when are they the same thing?

Is it easier to measure with a dry substance like rice or a liquid like water? Which is more accurate?

Why do we need to be able to convert between various measurements?

Look at imperial versus metric measurements for cups and teaspoons and tablespoons and discuss why they are different?

Was it easier to cook using volume or weight for a milkshake? Does this apply for all recipes – when would volume be easier than weight and vice versa?

Look at a variety of recipes that use both weight and volume in the same recipe – why do they do this?