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Mastering 4th Grade Math Curriculum Map

These no prep math worksheets, cover the five math curriculum. Each topic contains individual skills and concepts that match the learning expectations of the curriculum. Mastering Math is an excellent framework for reviewing the math curriculum at home for students who need extra practise.

Organized according to these five general curriculum threads:

1. Number Sense and Numeration (about numbers, counting and basic arithmetic operations);
2. Measurement (of distances, time, temperature, area and volume, using standard SI units);
3. Geometry and Spatial Sense (understanding and using shapes, figures, symmetry and translations);
4. Patterning and Algebra (patterns, problem solving and translating between words and equations);
5. Data Management and Probability (collecting, organizing and displaying information and drawing conclusions from it)

There are two versions of worksheets for each topic. We have included a Canadian version for each topic. There are also some google slides to go along with the Canadian worksheets.

Teacher Notes Include:

- At A Glance – List of Skills
- Table of Contents
- Teacher Assessment Rubric
- Meeting Common Core Standards List – US Version

NUMERATION WORKSHEETS

Numeration Worksheet Topics:

1. Represent Numbers
2. Place Value
3. Compare and Order Numbers
4. Number Words
5. Problems of Magnitude
6. Represent Decimal Numbers
7. Count by Tenths
8. Compare and Order Decimal Numbers
9. Money Amounts
10. Add and Subtract 2-digit Numbers
11. Add and Subtract 4-digit Numbers
12. Add Decimal Numbers
13. Subtract Decimal Numbers
14. Add and Subtract Money
15. Round Numbers
16. Estimate Reasonable Answers
17. Multiplication Problems
18. Multiplication Facts to Nine Times Nine
19. Multiplicative Relationships
20. Unit Rates
21. Multiply by 10, 100, and 1000
22. Multiply 2-digit by 1-digit Numbers
23. Division Facts to 81 Divided by 9
24. Divide 2-digit Numbers by 1-digit Numbers
25. Concrete Representation of Fractions
26. Standard Notation for Fractions
27. Fraction Benchmarks
28. Compare Fractions
29. Equivalent Fractions
30. Count Forward by Fractions
31. Fractions and Tenths Decimals

Numeration Common Core Standards Met:

- 4.OA.A.1 Interpret a multiplication question as a comparison (eg. $35 = 5 \times 7$ so 35 is 5 times as many as 7).
- 4.NBT.A.1 Recognize that a digit in one place represents 10 times what it is in the place to its right ($700 - 70 = 10$).
- 4.NBT.A.2 Read and write multi-digit whole numbers as whole numbers, names and expanded form. Compare numbers using $<$, $>$, and $=$.
- 4.NBT.A.3 Use place value understanding to round whole numbers to any place.
- 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers.
- 4.NBT.B.5 Multiply up to a four-digit number by a one-digit number.
- 4.NBT.B.6 Find whole number quotients and remainders (up to four-digit dividend and one-digit divisor).
- 4.NF.A.1 Understand and explain equivalent fractions. Generate examples of equivalent fractions.
- 4.NF.B.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$ (sum of equal parts).
- 4.NF.B.3a Understand the addition and subtraction of fractions.
- 4.NF.B.3b Decompose a fraction into a sum of fraction (use visual model).
- 4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100.
- 4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100.
- 4.NF.C.7 Add and subtract decimal numbers. Compare two decimals to hundredths. Use $<$, $>$, $=$.
- 4.MD.A.1 Know relative sizes of measurement units within one system of units (including metric system).
- 4.MD.A.2 Use the four operations to solve word problems involving distances, time, volume, mass, money. (use diagrams, number lines).

MEASUREMENT WORKSHEETS

- **Metric Measurement Google Slides**
- **Metric Measurement Version Included**

Measurement Worksheet Topics:

1. Compare Standard Units of Length
2. Estimate and Measure Length
3. Draw From Measurements
4. Select Units to Measure Perimeters
5. Estimate and Measure Perimeters
6. Side Lengths and Perimeters
7. Estimate and Measure Areas
8. Side Lengths and Areas
9. Area Or Perimeter?
10. Compare Shapes With the Same Perimeter or Area
11. Compare Standard Units of Mass
12. Estimate and Measure Capacity
13. Compare Standard Units of Capacity
14. Estimate and Measure Capacity
15. Select and Justify Standard Units of Mass and Capacity
16. Compare and Order Objects by Mass and Capacity
17. Estimate and Measure Volume
18. Time Intervals
19. Elapsed Time
20. Years, Decades, and Centuries

Measurement Common Core Standards Met:

- 4.MD.A.3 Apply area and perimeter formulas for real life and mathematical problems.
- 4.MD.A.1 Know relative sizes of measurement units within one system of units (including metric system).
- 4.MD.A.2 Use the four operations to solve word problems involving distances, time, volume, mass, money. (use diagrams, number lines).

GEOMETRY WORKSHEETS

Geometry Worksheet Topics:

1. Identify Benchmark Angles
2. Degrees of Benchmark Angles
3. Identify and Compare Quadrilaterals
4. Classify Quadrilaterals
5. Identify Prisms and Pyramids
6. Classify Prisms and Pyramids
7. Construct and Sketch Skeletons of 3D Figures
8. Construct Prisms and Pyramids From Nets
9. Draw and Describe Nets
10. Construct 3D Figures From Congruent Shapes
11. Construct a 3D Figure From a Picture or Model
12. Locate Objects on a Grid
13. Lines of Symmetry
14. Reflections
15. Create Symmetrical Designs with Reflections

Geometry Common Core Standards Met

- 4.MD.C.5 Recognize angles as geometric shapes. Understand measurement of angles.
- 4.MD.C.5a Understand that an angle that turns $\frac{1}{360}$ of a circle is a "one-degree angle: and is used to measure angles.
- 4.G.A.1 Draw points, lines, line segments, rays, angles and parallel and perpendicular lines. Identify these in two-dimensional figures.
- 4.G.A.2 Classify two-dimensional figures with regard to lines and angles. Identify right angles.
- 4.G.A.3 Identify line-symmetric figures and draw lines of symmetry.

PATTERNING WORKSHEETS

- **Patterning Google Slides**

Patterning Worksheet Topics:

1. Number Patterns
2. Create Number Patterns
3. Terms and Term Numbers
4. Predict Patterns
5. Patterns With Reflections
6. Missing Numbers – Multiplication
7. Inverse Relationship of Multiplication and Division
8. The Commutative Property of Multiplication
9. Distributing Multiplication Over Addition

Patterning Common Core Standards Met:

- 4.OA.C.5 Generate a number or shape pattern that follows a given rule.
- 4.OA.A.2 Multiply or divide to solve word problems.
- 4.OA.A.1 Interpret a multiplication question as a comparison (eg. $35 = 5 \times 7$ so 35 is 5 times as many as 7).

DATA MANAGEMENT WORKSHEETS

- **Canadian Data Management Google Slides**

Data Management Worksheet Topics:

1. Collect and Organize Survey Data
2. Display Data – Stem-and-Leaf Plot
3. Display Data – Double Bar Graph
4. Medians
5. Shape of Data Sets
6. Interpret and Draw Conclusions From Data
7. Compare Related Data
8. Simple Probability Experiment
9. Repeating Experiments

Data Management Common Core Standards Met

- 3.MD.B.3 Generate data and create graphs (picture, bar, line) to represent data. Interpret and compare data results.
- 4.OA.C.5 Generate a number or shape pattern that follows a given rule.

Math Lesson

FOURTH GRADE

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HOW TO USE THIS RESOURCE

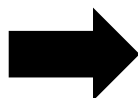
This product is a Google Slides presentation with interactive text boxes that students can fill out digitally! If you don't already have a free Google account, you will need to do that before downloading this digital resource. Each student will also need their own account to work on the slides digitally.

You will...

- **Save a copy** of the file on your own Google Drive so you can edit the copy. When you download the file, the original file is set to "View Only." **You must make a copy to edit & share with your students.** (When you open the file, it will send you to a link where you can select 'make a copy' and then add the file to your google drive.)
- When you're ready for your students to complete the assignment, you will share your downloaded copy with your students. Make sure that when you share the file, **you only allow viewing capability (not editing or commenting).**
- If you want to only share one slide at a time, open your saved copy of the file, select the slide you want to share, right-click on the slide in the view panel on the left side, select copy. Then open a new empty Google Slides presentation and paste the copied slide into the new file. If your students need more than one slide for their writing assignment, direct them to duplicate the slide.

Students will...

- When your students begin working on the assignment, instruct your students to **make a copy of the file.** This is the copy that they will edit. I would recommend having a common filename that each student should use with their name or student ID.
- When they complete the assignment, they will need to then share their new copy with you so that you will have access to their writing. If you're familiar with Google Classroom, they can simply submit the file there.
- **Product Link:**
- Click on the icon to view your purchased product. When you open the file, please **don't "request access"** to this file. You DO need to save a copy of the file to your own google drive so you can edit it and share with your students.



**Editable
Version**



**Digital
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Compare Standard Units of Length

1. Find a ruler that is marked with centimetres and has little bitty marks all along the edge in between the centimetres. These marks stand for **millimetres (mm for short)**. They're pretty small.

1 cm = _____ mm	
3 cm = _____ mm	
10 cm = _____ mm	
30 cm = _____ mm	

2. Most desk-sized rulers are only about 30 cm long, so you will need to find a metre stick or a measuring tape as long as or longer than a metre with the same kind of mm markings.

a) How many centimetres are in a metre?

3. A **decimetre** is one tenth of a metre-the “**deci**” part means “**tenth**.” We call it a “dm” for short.

1 m = _____ dm	
1 dm = _____ cm	
30 cm = _____ dm	

4. a) How many millimetres in a decimetre?

b) How many mm are in 1 m?

5. A kilometre is a long way. It's 1,000 metres! How many decimetres are in a kilometre?

6. Use what you know to fill in the following chart.

1 km	_____ m	_____ dm
1 m	_____ dm	_____ cm
1 dm	_____ cm	_____ mm
1 cm	_____ mm	

Practise: Convert different measurements between kilometres, metres, decimetres, centimetres and millimetres to find appropriate lengths!

Estimate and Measure Length

1. Estimate and then measure the following using centimetres.

	Estimate	Measured
the length of your shoe		
the width of a plate		
the height of a chair back		

2. Estimate and then measure the following using metres.

	Estimate	Measured
the width of a chair seat		
the height of the ceiling		
the length of the hall		

3. Estimate and then measure the following using millimetres.

	Estimate	Measured
the length of a fork		
the width of your finger		
the height of an eraser		

4. Describe a distance that you think might be about 3 kilometres.

Think about: Are the given units really the most accurate or useful measurement for some of these things? If not, what would be better? Discuss your answers with your classmates!

Select Units to Measure Perimeters

1. Given the choice of kilometres, metres, decimetres, centimetres and millimetres state which unit you would use for measuring the perimeter of each of the following items. Justify your choice.

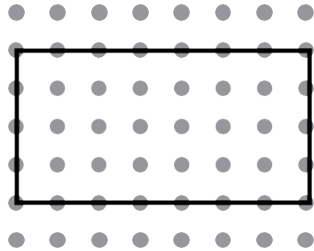
	Unit to Measure Perimeter km, m, dm, cm, or mm	Explain why.
around the outside of a book		
around a table		
around your finger		
around this tiny triangle 		
around a block		
the height of a house		
a shape drawn along the lines of cm grid paper		
a kite shape drawn freehand on blank paper.		

2. What factors did you consider when choosing the most appropriate standard units to use for measuring these items? Explain.

Estimate and Measure Perimeters

1. Estimate and then measure the perimeters of the following shapes using the dot grid to count.

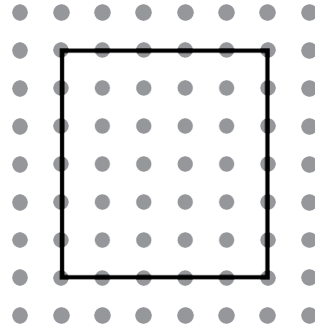
a)



Estimate: _____

Counted: _____

b)



Estimate: _____

Counted: _____

2. Find three small polygonal shapes in your environment such as a rectangular book, a square box, or a triangle in a picture or pattern. List the shapes below. Estimate and then measure the perimeters of each, recording the measurements on the lines. Record the method you used to measure, too!

shape	a)	b)	c)
estimate			
measured			
method			

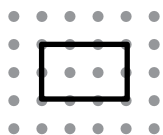
Practise: Measure the perimeters of polygons in your environment, like table tops, books, small furniture or windows and so on!

Side Lengths and Perimeters

Measurement

1. For each of the following rectangles, use the dot grid to measure the length, width and perimeter:

a)

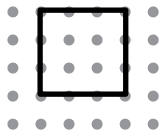


Length: _____

Width: _____

Perimeter: _____

b)

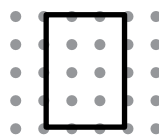


Length: _____

Width: _____

Perimeter: _____

c)



Length: _____

Width: _____

Perimeter: _____

- d) What do you notice about the relationship of the sides to the perimeter?

2. Insert lines on the dot grid below to draw a series of rectangles that are all four units tall and have perimeters that are:

a) 10

b) 12

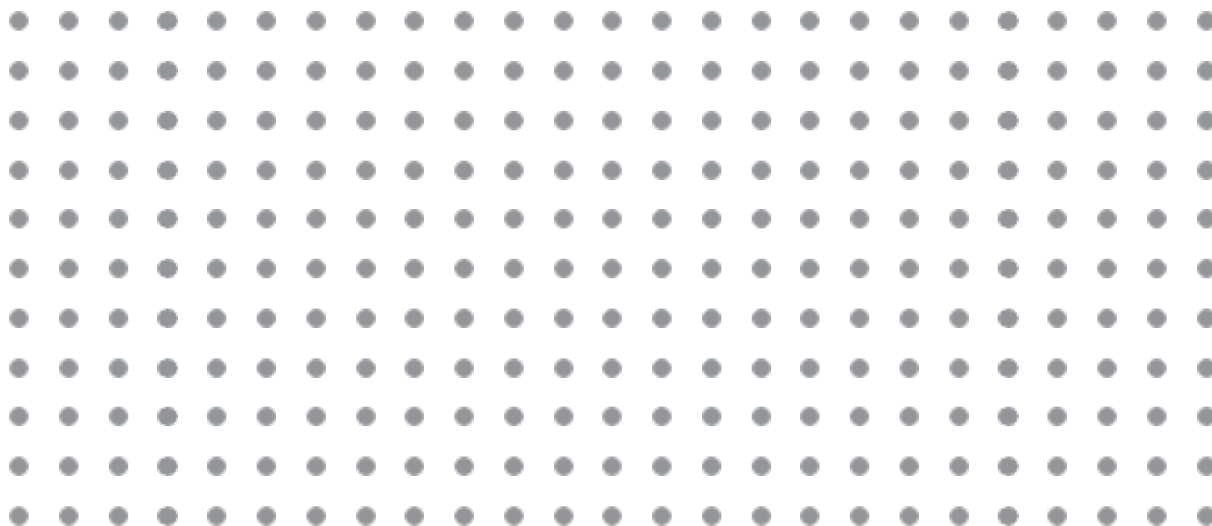
c) 14

d) 16

e) 18

f) 20 units.

You can overlap some of them if you use different colours.

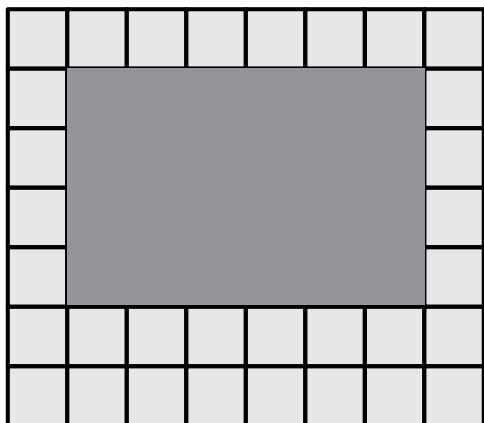


3. What do you notice about the side lengths of the rectangles?

Practise: Measure and compare the length and width to the perimeter of more rectangles until you think you can make a general rule about the relationship of these three measurements!

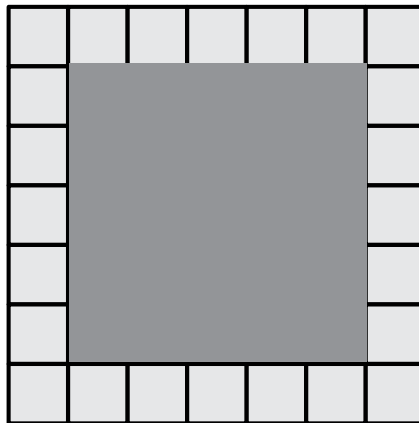
Estimate and Measure Areas

1. Use the grid behind the pictures to help you estimate the areas, then count the number of squares to check.



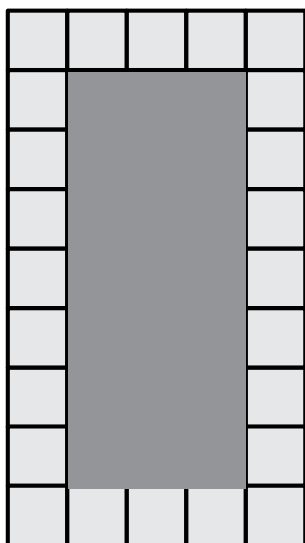
a) Estimate: _____

Count: _____



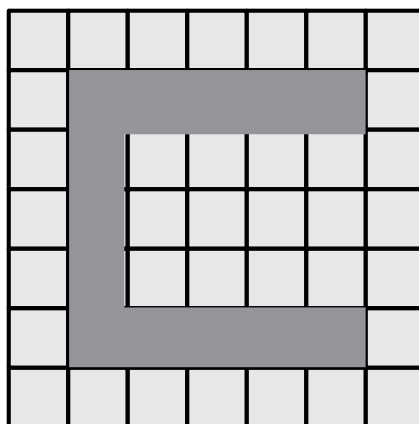
b) Estimate: _____

Count: _____



c) Estimate: _____

Count: _____

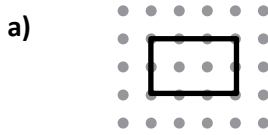


d) Estimate: _____

Count: _____

Side Lengths and Areas

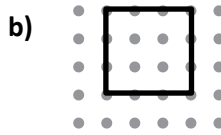
1. For each of the following rectangles, use the dot grid to measure the length and width and then use the squares to measure the area.



Length: _____

Width: _____

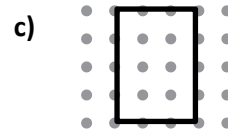
Area: _____



Length: _____

Width: _____

Area: _____



Length: _____

Width: _____

Area: _____

- d) What do you notice about the relationship of the sides to the area?

2. Now use the dot grid below to draw a series of rectangles that are all 3 units tall and have areas of:

a) 3

b) 6

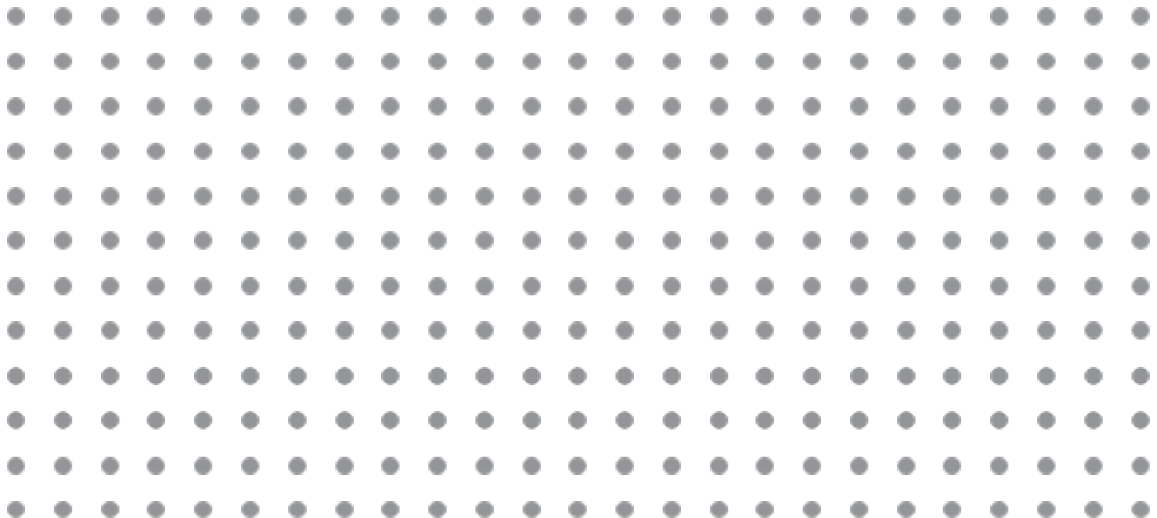
c) 9

d) 12

e) 15

f) 18 units.

You can overlap some of them if you use different colours.



3. What do you notice about the side lengths of the rectangles?

Practise: Measure and compare the length and width to the area of more rectangles until you think you can make a general rule about the relationship of these three measurements!

Area Or Perimeter?

Measurement

As you have discovered, finding the perimeter or the area of a rectangle means you need to know the lengths of the sides. In basic terms, perimeter goes around things and area covers them.

1. Decide whether you need to know the area or the perimeter in each of the following cases and write the appropriate choice on the line.

- a) You are painting a wall. _____
- b) You are putting in a carpet. _____
- c) You are making a border for a card. _____
- c) You are putting a ribbon on a present. _____
- e) You are cutting paper for the picture. _____
- f) You are making a picture frame. _____
- g) You are making a garden big enough for pumpkins. _____
- h) You are putting a fence around the garden. _____

2. a) Write an example from your environment where you need to know an area.

b) Write an example from your environment where you need to know a perimeter.

Compare Standard Units of Mass

Measurement

The standard unit of mass is a kilogram. As you learned in the section on lengths, a kilometre is 1000 metres. Since the names of different types of metric units and the different sizes are all related, that means a kilogram is 1000 grams. You already know about how big a kilogram is. A gram is pretty small! A standard metal paperclip is a good benchmark for a gram. Another benchmark you might have available is a sugar cube, which is about 4 grams.

- a) About how many paperclips in a kg? _____
- b) About how many sugar cubes in a kg? _____

If you have a scale with known masses, use that and experiment to find the masses of various items, and the number of grams, decigrams and other sized known masses in a kilogram. If not, you might be able to ask at the post office about measuring small masses or use the scales at a grocery store or other stores where things are sold by mass or weight. Some of these may only be able to show tenths of kilograms.

- a) How many grams are in a tenth of a kg? _____
- b) A bar of cheddar cheese is 500 g. How many are in a kg? _____
- c) A block of cream cheese is 250 g. How many in a kilogram? _____
- d) How many 10 g blocks are there in a kilogram? _____
- e) A large jar of peanut butter is 2 kg. How many grams is this? _____



Practise: Find some other similar food items that come measured in grams, and make a list of each item and its mass! Predict, then measure how many of each are in a kg.

Estimate and Measure Mass

Now that you have found some items that you know the masses of, you can use them to estimate and measure the masses of other items! Fill in the chart below. On the blank “Object” lines, you can fill in the things you found and listed for the previous page to make a record of them. Then find some other things in your environment. Find some that are smaller, and some that are larger than a kilogram, too!



Once again, if you have a scale at school, use it to measure with. Write your answers for the measured amounts to the nearest gram, or as close as you can get depending on what your scale allows for or give a mass in kg!

Object	Estimate	Measured (unit)
sugar cube		
cheese		
peanut butter		

Compare Standard Units of Capacity

Measurement

The standard unit of capacity is a litre. One way to measure this is to take a cube-shaped box, with all sides 10 cm long, and fill it with water. There is exactly 1L of water in a box that size.

1. From the section on lengths, you know there are 1000 millimetres in a metre, and the prefixes (e.g., “milli-”) always mean the same things in metric.

That means there are _____ millilitres in 1 litre.

2. a) A teaspoon is about 5 mL. About how many teaspoons would it take to make 1 L?

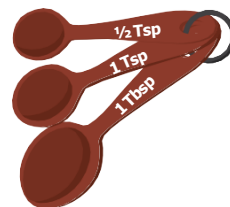
b) How many 50 mL measures would it take to fill 1 L? _____

c) A quarter of a litre is _____ mL.

d) How many 50 mL measures will fill a quarter of a litre? _____

e) A juice box usually has either 200 or 250 mL. How many 200 mL juice boxes make 1 L?

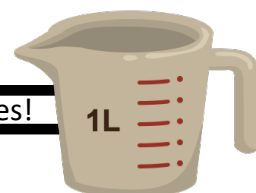
f) How many 250 mL juice boxes make 1 L? _____



Experiment with measuring water. Choose containers that are smaller than 1L, and measure them by filling with water and then measuring that amount of water in a marked cup. Make a list of different containers, and how big they are. Predict how many of them it will take to make 1L, then measure to check.

Containers	Size	Estimate how many it takes to make 1L	Measure How many it takes to make 1L.

Practise: Convert different measurements between litres and millilitres!



Estimate and Measure Capacity

Measurement

Now that you have some containers that you know the capacities of, you can use them to estimate and measure the capacities of other things!

Fill in the chart below. On the blank “Container” lines, you can fill in the objects you measured on the previous page, to make a record of them. Then find some other objects with capacity in your environment (maybe some that are bigger than a litre, too!), and measure them as well! Measure to the nearest mL if you can, or to the nearest 10 mL or other printed mark on your cup. Make sure you look at the line of the water at eye level, because otherwise the thickness of the glass (and other things) might not give you an accurate reading!

Container	Estimate	Measured
1 L measure		
teaspoon		
drinking glass		

Practise: Compare the capacities of various items in your environment by measuring them in millilitres and litres, and think about which is the most appropriate measure for a given item or purpose! Talk with your teacher and classmates about things that are measured in mL and L, too!

Select and Justify Standard Units of Mass and Capacity

Measurement

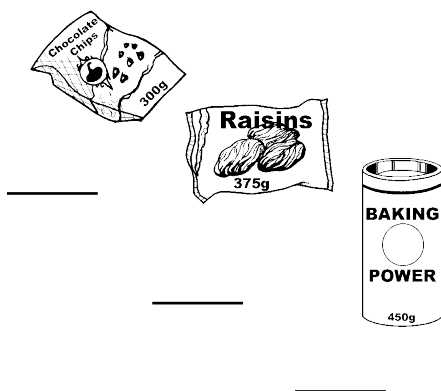
1. For each of the following items, choose whether you would measure in grams or kilograms and explain why.
 - a) a baseball
Why?
 - b) a person
Why?
 - c) a small toy
Why?
2.
 - a) How many milligrams are there in a gram?
 - b) What sort of thing would you measure in milligrams? Explain why. Talk to your grown-up about this question, too.
3. For each of the following items, choose whether you would measure in litres or millilitres and explain why.
 - a) a bathtub
Why?
 - b) a soup bowl
Why?
 - c) a big soup pot
Why?
4. Explain why you would choose a particular unit of mass or capacity for a given purpose. What factors would you need to consider?

Compare and Order Objects by Mass and Capacity

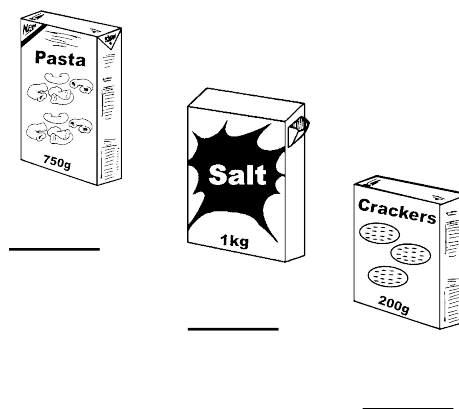
Measurement

- Put the following groups of objects in order from lightest to heaviest by writing 1 for lightest and 3 for heaviest underneath.

a)



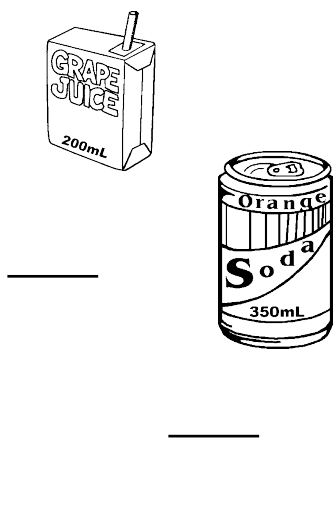
b)



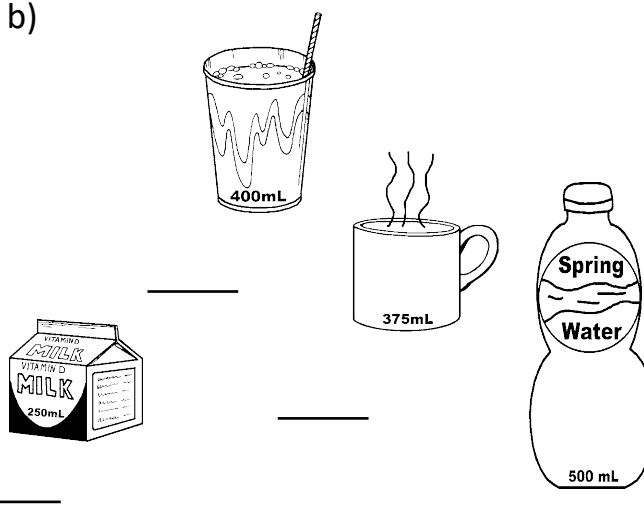
(Careful! The size doesn't always match up with the mass!)

- Put the following groups of objects in order from most to least capacity by writing 1 for biggest and 3 for smallest underneath.

a)



b)



Practise: Think about other things you can compare. Practise measuring, comparing and ranking the mass and capacity of things in your environment!

Estimate and Measure Volume

Measurement

Volume is the amount of space something takes up. It’s a very similar idea to capacity, because that is the amount of space a liquid takes up, but volume also tells us about the sizes of solid objects. Volume tells us exactly how big something is! Usually we use the word “volume” to describe the space taken up by solid objects and “capacity” for liquids.

We measure volume by using a unit that has volume to it. The standard metric system unit that’s easiest to handle is a cube with sides 1 cm long.

For each of the following objects, make a neat stack or series of stacks of cubes that is as close to the same size in length, width and height as possible to the item you are measuring. Then carefully take the stack apart and count the cubes to find the volume. Record your results in the chart below. Make sure to record what size your units are, too! Fill in the blank “object” spaces with things you have in your environment.

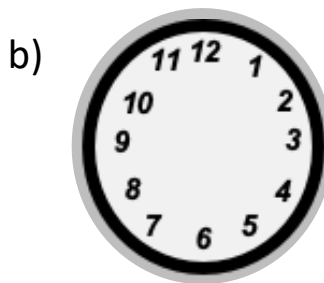
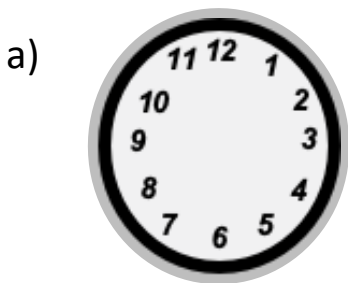
Things that are rectangular prisms will be the easiest to measure! Why is that? _____

Object	Estimated Volume	Width	Length	Height	Measured Volume
book (about 1 cm thick)					
large toy block					

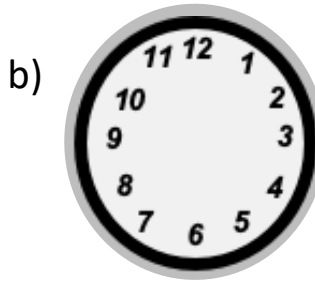
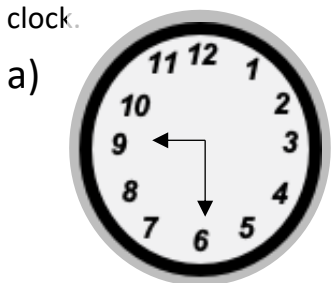
Time Intervals

Measurement

1. a) It takes eight minutes to bake a sheet of cookies. If the first tray goes in at 9:15, draw hands on the first clock face to show what time it comes out.



- b) If a second tray gets put in as soon as the first comes out, draw the time when the second tray comes out of the oven on the second clock face.
- c) How long will it take to bake 6 sheets of cookies? _____
2. a) When Kim gets to soccer practise, the clock looks like the one on the left. Write the time under that clock.



- b) Warm-up, practise and cool-down take 52 minutes. Draw the clock hands when it's time to go on the right clock face and write the time in the box under the clock.
3. The washer takes 22 minutes. It stopped at 3:25; when did it start?
4. Pat and Alex are going to watch a movie. It starts at 2:00 and ends at 3:26. How long is the movie?
5. The play is supposed to start at 8:00 pm but is delayed by 5 minutes. The first half lasts 42 minutes. Write the beginning and ending times of the first half of the play in digital clock format

Practise: Draw or write the start and stop of time intervals to show their length. You can also map them with your finger or a pointer on a clock face.

Elapsed Time

Measurement

1. Suppose you wake up at 7:00 and have to be ready to go to school by 8:00. It takes 10 minutes to eat breakfast, 5 minutes to brush your teeth and wash up, 15 minutes to get dressed, 15 minutes to get all your school things together and another 5 minutes to get your coat and boots on.
2. How much time does this take altogether?
3. Will you be ready in time?
4. Do you have any time to spare?
5. Kim and Jan are making 3D painted wooden decorations. They need to let the glue dry for 3 and a half hours before painting and let the paint dry for 2 hours. It takes them 25 minutes to get the parts glued and 40 minutes to paint everything. How long does it take to get this far?
6. If they start at 1:00, what time will the decorations be done?
7. Use this space to make a timeline for Kim and Jan's decorations. Draw in the intervals for gluing, painting and drying in proper order, and write in what times they start and end at:
8. Terry's family will spend 5 weeks of the summer break at their cottage. How many days is this?
9. Sunny spends 20 minutes a day practising music. How long does Sunny practise over a week?
10. It takes 70 days for Pat's bean plants to grow and produce beans. How many weeks is that?
11. The summer growing season is from the start of May until the end of September where Sam lives. How many months is this? _____
12. Lou was born 3 years and 7 months ago. How many months is this? _____

Years, Decades, and Centuries

1. Ten years is called a “decade” and 100 years is called a “century.”
2. Do you know anyone who has lived for a decade? Who?
3. Do you know anyone 2 decades old? Who?
4. How many years is this?
5. Do you know anyone who is 5 decades old?
6. How about a century?
7. How many decades old is the oldest person you know?
8. How about the oldest animal?
9. How many decades are there in a century?
10. If there are 4 seasons in a year, how many are in a decade?
11. How many seasons are in a century?
12. How many months are there in a century?
13. A leap year, where February has an extra day, happens once every four years.
14. How many leap years are there in a century?
15. Why can't you so easily give an answer for how many leap years there are in a decade?
16. Canada was founded in 1867. How many years ago was that?
17. About how many decades? (“About” means you can use rounding!)
18. Describe Canada's age using centuries

Compare Standard Units of Length:

1. a) 10 b) 30 c) 100 d) 300 2. 100 3. a) 10 b) 10 c) 3
4. a) 100 b) 1000
5. 10,000
6. $1 \text{ km} = 1000 \text{ m}$; $10,000 \text{ dm}$; $1 \text{ m} = 10 \text{ dm} = 100 \text{ cm} = 1000 \text{ mm}$; $1 \text{ dm} = 10 \text{ cm} = 100 \text{ mm}$; $1 \text{ cm} = 10 \text{ mm}$

Estimate and Measure Length:

Answers may vary; ensure accuracy

Draw From Measurements:

Answers may vary; ensure accuracy

1. e) 3.2 cm is shortest, 11.6 cm is longest 2. the 121 mm is longer
3. b) they're equal

Select Units to Measure Perimeters:

Answers may vary; ensure justification is completed

Estimate and Measure Perimeters:

counted values: 1. a) 22 units b) 22 units 2. Answers may vary.

Side Lengths and Perimeters:

1. a) 2, 3, 10 b) 3, 3, 12 c) 4, 3, 14 d) Answers may vary.
2. Answers may vary; lengths should increase by 1 from 1 to 6 over (a) through (f)

Estimate and Measure Areas:

counted: a) 24 square units b) 25 square units c) 21 square units d) 13 square units

Side Lengths and Areas:

1. a) 2, 3, 6 b) 3, 3, 9 c) 4, 3, 12 d) Answers may vary.
2. Answers may vary. lengths should increase by 1 from 1 to 6 over (a) through (f)

Area Or Perimeter?:

- a) area b) area c) perimeter d) perimeter e) area f) perimeter g) area
h) perimeter
1. Answers may vary.

Compare Shapes With the Same Perimeter or Area:

1. Answers may vary. 2. Answers may vary.

Compare Standard Units of Mass:

1. a) 1000 b) 250 c) 100 2. a) 2 b) 4 c) 100 d) 2000

Estimate and Measure Mass:

Answers may vary.

Compare Standard Units of Capacity:

1. 1000 2. a) 200 b) 20 c) 250 d) 5 e) 5, 4

Estimate and Measure Capacity

Answers may vary.

Select and Justify Standard Units of Mass and Capacity:

- Answers may vary. Ensure justification is completed.
- a) 1000

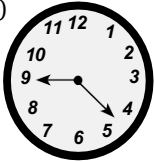
Compare and Order Objects by Mass and Capacity:

- a) 1, 2, 3 b) 2, 3, 1
- a) 3, 1, 2 b) 2, 3, 1

Estimate and Measure Volume: Answers may vary.

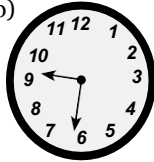
Time Intervals:

1. a)



3. 3:03

b)



4. 1 hour and 26 minutes, OR 86 minutes

c) 50 minutes

2. a) 5:30 b)



5. 8:05; 8:47

Elapsed Time:

- a) 50 minutes b) yes c) yes (10 minutes!)
- a) six hours and 35 minutes b) 7:35 c) Answers may vary.; should show 1:00, 1:25; 4:55; 5:35; 7:35
- 35 4. 140 minutes, or 2 hours and 20 minutes 5. 10 6. 5 7. 43

Years, Decades, and Centuries:

Answers for 1-5 will mostly vary.

- 2 decades = 20 years 6. 10 7. a) 40 b) 400 8. 1200
- a) 25 b) Answers may vary, but you can't tell which year of the four the decade starts on
- Answers may vary; ensure accuracy!

Compare Standard Units of Length



1. Find a ruler that is marked with centimetres and has little bitty marks all along the edge in between the centimetres. These marks stand for millimetres (mm for short). They're pretty small!

- a) How many mm are in 1 cm? _____ b) How many mm are in 3 cm? _____
c) How many mm are in 10 cm? _____ d) How many mm are in 30 cm? _____

2. Most desk-sized rulers are only about 30 cm long, so you will need to find a metre stick or a measuring tape as long as or longer than a metre with the same kind of mm markings.

How many centimetres are in a metre? _____

3. A decimetre is one tenth of a metre – the “deci” part means “tenth.” We call it a “dm” for short.

- a) How many dm are in 1 m? _____ b) How many cm are in 1 dm? _____
c) How many dm are in your 30 cm ruler? _____

4. a) How many millimetres in a decimetre? _____

b) How many mm are in 1 m? _____

5. A kilometre is a long way. It's 1,000 metres! How many decimetres are in a kilometre?

6. Use what you know to fill in the following chart.

1 km = _____ m = _____ dm

1 m = _____ dm = _____ cm = _____ mm

1 dm = _____ cm = _____ mm

1 cm = _____ mm

Practise: Convert different measurements between kilometres, metres, decimetres, centimetres and millimetres to find appropriate lengths!



Estimate and Measure Length



1. Estimate and then measure the following using centimetres.

	Estimate:	Measured:
a) the length of your shoe:	_____	_____
b) the width of a plate:	_____	_____
c) the height of a chair back:	_____	_____

2. Estimate and then measure the following using metres.

	Estimate:	Measured:
a) the width of a chair seat:	_____	_____
b) the height of the ceiling:	_____	_____
c) the length of the hall:	_____	_____

3. Estimate and then measure the following using millimetres.

	Estimate:	Measured:
a) the length of a fork:	_____	_____
b) the width of your finger:	_____	_____
c) the height of an eraser:	_____	_____

4. Describe a distance that you think might be about 3 kilometres.

Think about:

Are the given units really the most accurate or useful measurement for some of these things? If not, what would be better? Discuss your answers with your classmates!



Draw From Measurements



1. Use your ruler to draw arrows that are:

a) 5.0 cm long:

b) 8.8 cm long:

c) 3.2 cm long:

d) 11.6 cm long:

e) Which one is shortest? _____ Longest? _____

2. Draw a line that is 59 mm long, and one that is 121 mm long in this space:

Which is longer? _____

3. a) Draw a line 14.7 cm long. Below it, draw a line 147 mm long.

b) How do these two lines compare? _____

Practise: Draw lines of different lengths using cm and mm to measure. Have a classmate check the lines for accuracy.



Select Units to Measure Perimeters



1. Given the choice of kilometres, metres, decimetres, centimetres and millimetres state which unit you would use for measuring the perimeter of each of the following items. Justify your choice.

a) around the outside of a book: _____

Why? _____

b) around a table: _____

Why? _____

c) around your finger: _____

Why? _____

d) around this tiny triangle: _____



Why? _____

e) around a block: _____

Why? _____

f) the height of a house: _____

Why? _____

g) a shape drawn along the lines of cm grid paper: _____

Why? _____

h) a kite shape drawn freehand on blank paper: _____

Why? _____

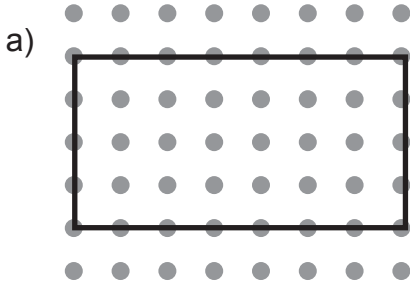
2. What factors did you consider when choosing the most appropriate standard units to use for measuring these items? Explain! _____



Estimate and Measure Perimeters

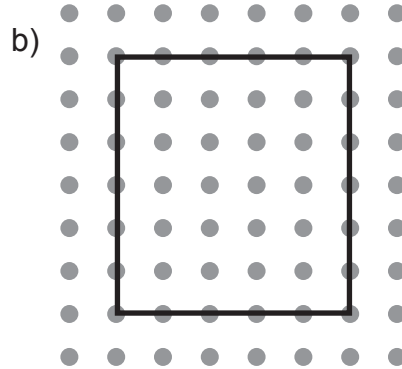


1. Estimate and then measure the perimeters of the following shapes using the dot grid to count.



Estimate: _____

Counted: _____



Estimate: _____

Counted: _____

2. Find three small polygonal shapes in your environment such as a rectangular book, a square box, or a triangle in a picture or pattern. List and sketch the shapes below. Estimate and then measure the perimeters of each, recording the measurements on the lines. Record the method you used to measure, too!

a) _____

b) _____

c) _____

Estimate: _____

Estimate: _____

Estimate: _____

Measured: _____

Measured: _____

Measured: _____

Method: _____

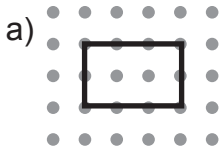
Practise: Measure the perimeters of polygons in your environment, like table tops, books, small furniture or windows and so on!



Side Lengths and Perimeters



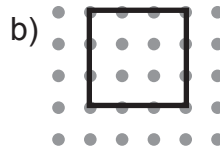
1. For each of the following rectangles, use the dot grid to measure the length, width and perimeter:



Length: _____

Width: _____

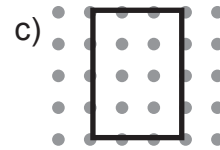
Perimeter: _____



Length: _____

Width: _____

Perimeter: _____



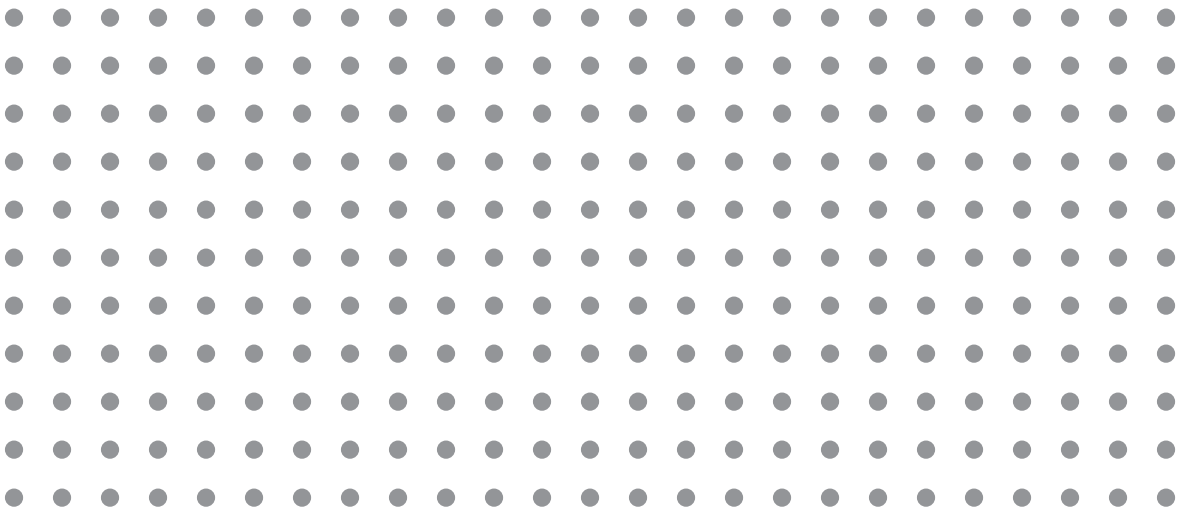
Length: _____

Width: _____

Perimeter: _____

- d) What do you notice about the relationship of the sides to the perimeter?

2. Now use the dot grid below to draw a series of rectangles that are all four units tall and have perimeters that are **a)** 10, **b)** 12, **c)** 14, **d)** 16, **e)** 18 and **f)** 20 units. You can overlap some of them if you use different colours.



What do you notice about the side lengths of the rectangles?

Practise:

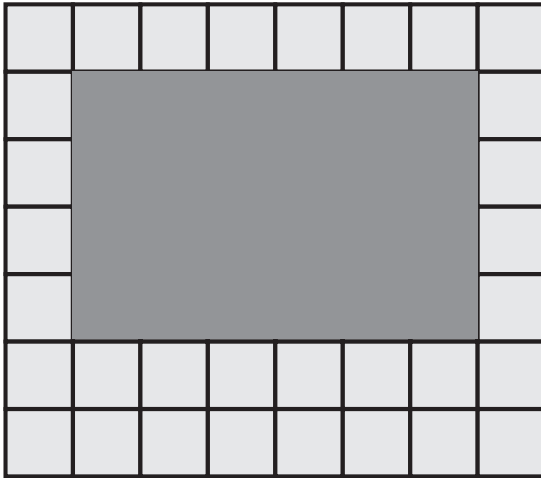
Measure and compare the length and width to the perimeter of more rectangles until you think you can make a general rule about the relationship of these three measurements!



Estimate and Measure Areas

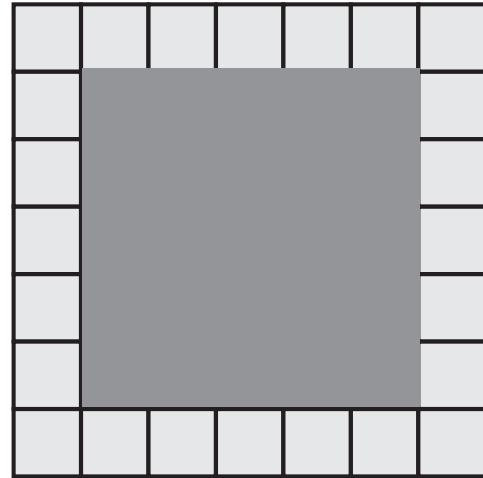


Use the grid behind the pictures to help you estimate the areas, then count the number of squares to check.



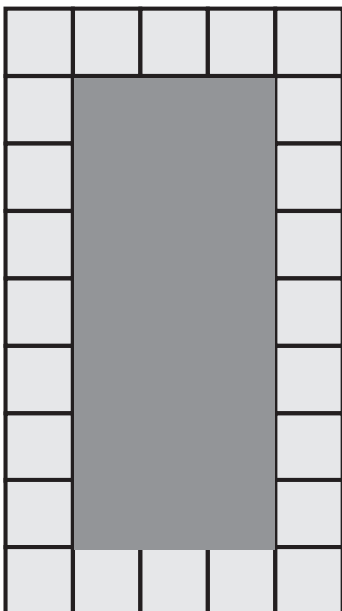
a) Estimate: _____

Count: _____



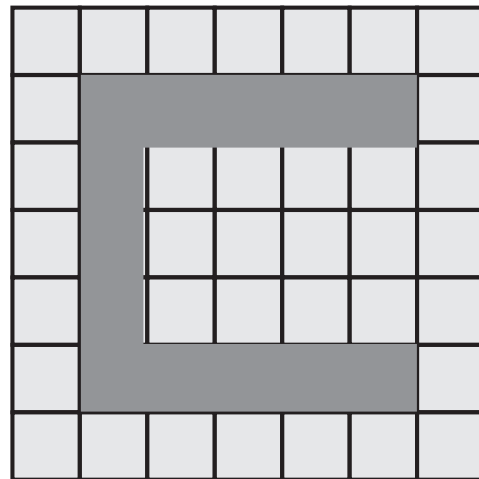
b) Estimate: _____

Count: _____



c) Estimate: _____

Count: _____



d) Estimate: _____

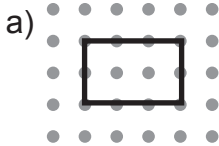
Count: _____



Side Lengths and Areas



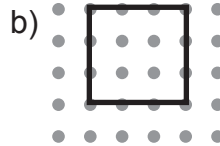
1. For each of the following rectangles, use the dot grid to measure the length and width and then use the squares to measure the area.



Length: _____

Width: _____

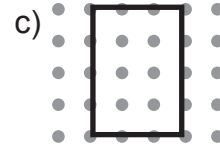
Area: _____



Length: _____

Width: _____

Area: _____



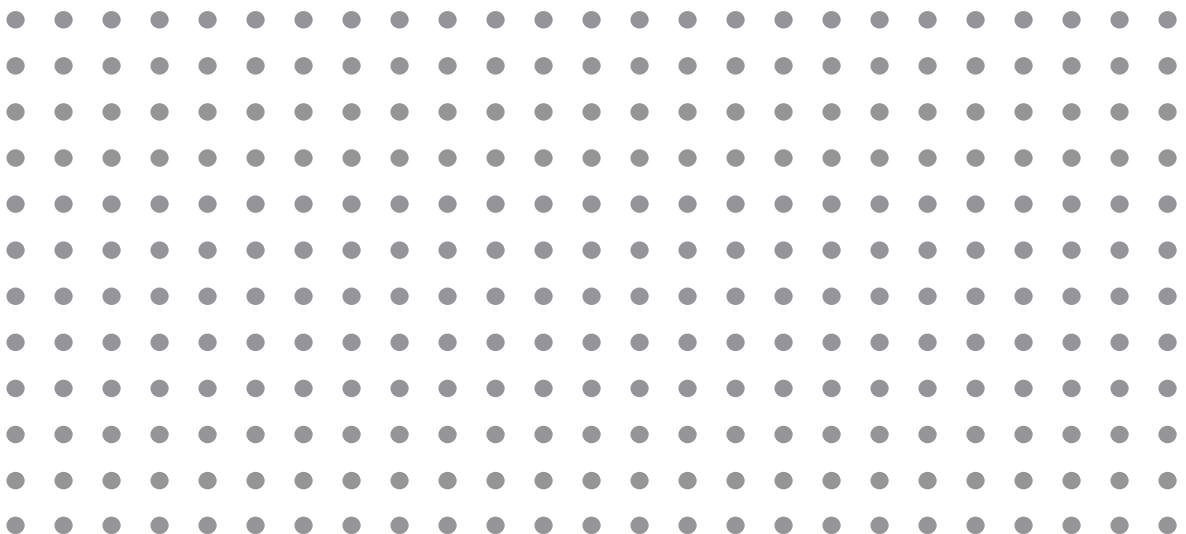
Length: _____

Width: _____

Area: _____

- d) What do you notice about the relationship of the sides to the area?

2. Now use the dot grid below to draw a series of rectangles that are all 3 units tall and have areas that are **a) 3**, **b) 6**, **c) 9**, **d) 12**, **e) 15** and **f) 18** units. You can overlap some of them if you use different colours.



What do you notice about the side lengths of the rectangles?

Practise:

Measure and compare the length and width to the area of more rectangles until you think you can make a general rule about the relationship of these three measurements!



Area Or Perimeter?



As you have discovered, finding the perimeter or the area of a rectangle means you need to know the lengths of the sides. In basic terms, perimeter goes around things and area covers them.

1. Decide whether you need to know the area or the perimeter in each of the following cases, and write the appropriate choice on the line.

a) You are painting a wall. _____

b) You are putting in a carpet. _____

c) You are making a border for a card. _____

d) You are putting a ribbon on a present. _____

e) You are cutting paper for the picture. _____

f) You are making a picture frame. _____

g) You are making a garden big enough for pumpkins. _____

h) You are putting a fence around the garden. _____

2. a) Write an example from your environment where you need to know an area.

- b) Write an example from your environment where you need to know a perimeter.

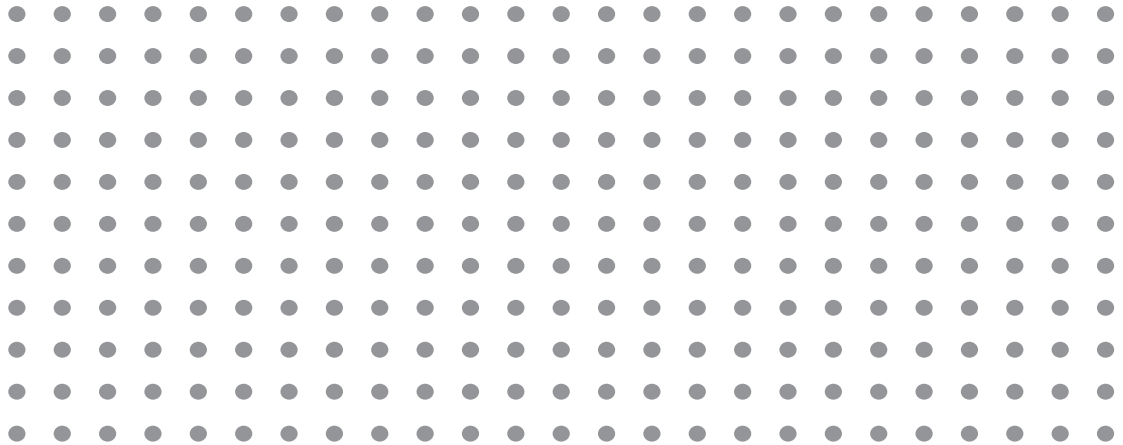


Compare Shapes With the Same Perimeter or Area



1. Use the dot grid to help you draw a rectangle with a perimeter of 18 units. Beside it, draw a different rectangle with the same perimeter.

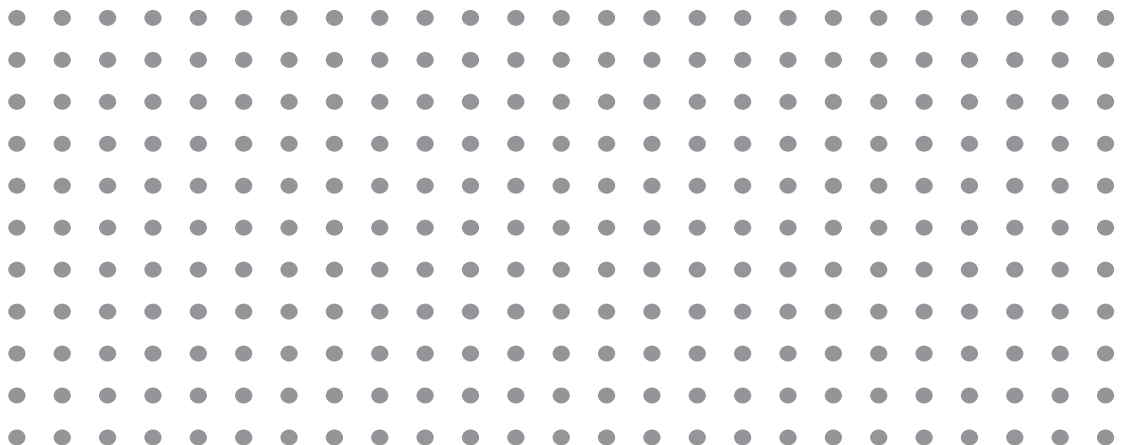
- a) How many different rectangles (with whole number sides) can you draw with this perimeter? If you need to, sketch them on a separate sheet.



- b) What do you notice about how the sides of the different rectangles change?

2. Use the dot grid to help you draw a rectangle with an area of 18 units. Beside it, draw a different rectangle with the same area.

- a) How many different rectangles (with whole number sides) can you draw with this area? If you need to, sketch them on a separate sheet.



- b) What do you notice about how the sides of the different rectangles change in relation to each other?

Practise: Make different rectangles with the same perimeters or areas and compare how the lengths and widths change!



Compare Standard Units of Mass



The standard unit of mass is a kilogram. As you learned in the section on lengths, a kilometre is 1000 metres. Since the names of different types of metric units and the different sizes are all related, that means a kilogram is 1000 grams. You already know about how big a kilogram is. A gram is pretty small! A standard metal paperclip is a good benchmark for a gram. Another benchmark you might have available is a sugar cube, which is about 4 grams.

1. a) About how many paperclips in a kg? _____
- b) About how many sugar cubes in a kg? _____
- c) If you have a scale with known masses, use that and experiment to find the masses of various items, and the number of grams, decigrams and other sized known masses in a kilogram. If not, you might be able to ask at the post office about measuring small masses or use the scales at a grocery store or other stores where things are sold by mass or weight. Some of these may only be able to show tenths of kilograms. How many grams are in a tenth of a kg? _____.
2. a) A bar of cheddar cheese is 500 g. How many are in a kg? _____
- b) A block of cream cheese is 250 g. How many in a kilogram? _____
- c) How many 10 g blocks are there in a kilogram? _____
- d) A large jar of peanut butter is 2 kg. How many grams is this? _____



Practise:

Find some other similar food items that come measured in grams, and make a list of each item and its mass! Predict, then measure how many of each are in a kg.



Estimate and Measure Mass



Now that you have found some items that you know the masses of, you can use them to estimate and measure the masses of other items! Fill in the chart below. On the blank “Object” lines, you can fill in the things you found and listed for the previous page to make a record of them. Then find some other things in your environment. Find some that are smaller, and some that are larger than a kilogram, too!



Once again, if you have a scale at school, use it to measure with. Write your answers for the measured amounts to the nearest gram, or as close as you can get depending on what your scale allows for, or give a mass in kg!

Object	Estimate	Measured (unit)
sugar cube		
cheese		
peanut butter		



Compare Standard Units of Capacity



The standard unit of capacity is a litre. One way to measure this is to take a cube-shaped box, with all sides 10 cm long, and fill it with water. There is exactly 1 L of water in a box that size.

1. From the section on lengths, you know there are 1000 millimetres in a metre, and the prefixes (e.g., “milli-”) always mean the same things in metric.

That means there are _____ millilitres in 1 litre.

2. a) A teaspoon is about 5 mL. About how many teaspoons would it take to make 1 L?

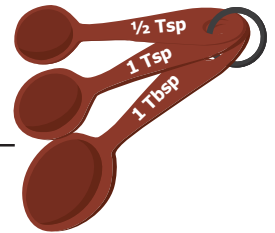
- b) How many 50 mL measures would it take to fill 1 L? _____

- c) A quarter of a litre is _____ mL.

- d) How many 50 mL measures will fill a quarter of a litre? _____

- e) A juice box usually has either 200 or 250 mL. How many 200 mL juice boxes

make 1 L? _____ How many 250 mL juice boxes make 1 L? _____



3. Experiment with measuring water. Choose containers that are smaller than 1 L, and measure them by filling with water and then measuring that amount of water in a marked cup. Make a list of different containers, and how big they are. Predict how many of them it will take to make 1 L, then measure to check!



Practise: Convert different measurements between litres and millilitres!



Estimate and Measure Capacity



Now that you have some containers that you know the capacities of, you can use them to estimate and measure the capacities of other things!

Fill in the chart below. On the blank “Container” lines, you can fill in the objects you measured on the previous page, to make a record of them. Then find some other objects with capacity in your environment (maybe some that are bigger than a litre, too!), and measure them as well! Measure to the nearest mL if you can, or to the nearest 10 mL or other printed mark on your cup. Make sure you look at the line of the water at eye level, because otherwise the thickness of the glass (and other things) might not give you an accurate reading!

Container	Estimate	Measured
1 L measure		
teaspoon		
drinking glass		

Practise:

Compare the capacities of various items in your environment by measuring them in millilitres and litres, and think about which is the most appropriate measure for a given item or purpose! Talk with your teacher and classmates about things that are measured in mL and L, too!



Select and Justify Standard Units of Mass and Capacity



1. For each of the following items, choose whether you would measure in grams or kilograms and explain why.

a) a baseball

Why? _____

b) a person

Why? _____

c) a small toy

Why? _____

2. a) How many milligrams are there in a gram? _____

b) What sort of thing would you measure in milligrams? Explain why! Talk to your grown-up about this question, too.

3. For each of the following items, choose whether you would measure in litres or millilitres and explain why.

a) a bathtub

Why? _____

b) a soup bowl

Why? _____

c) a big soup pot

Why? _____

4. Explain why you would choose a particular unit of mass or capacity for a given purpose. What factors would you need to consider?



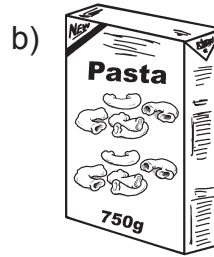
Compare and Order Objects by Mass and Capacity

1. Put the following groups of objects in order from lightest to heaviest by writing 1 for lightest and 3 for heaviest underneath.

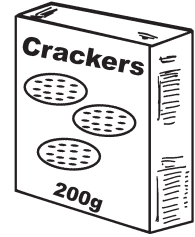






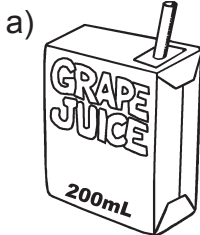






(Careful! The size doesn't always match up with the mass!)

2. Put the following groups of objects in order from most to least capacity by writing 1 for biggest and 3 for smallest underneath.

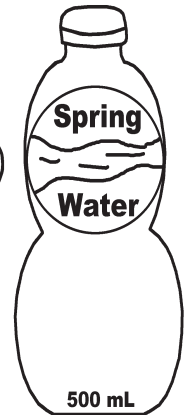












Practise:

Think about other things you can compare. Practise measuring, comparing and ranking the mass and capacity of things in your environment!



Estimate and Measure Volume



Volume is the amount of space something takes up. It's a very similar idea to capacity, because that is the amount of space a liquid takes up, but volume also tells us about the sizes of solid objects. Volume tells us exactly how big something is! Usually we use the word "volume" to describe the space taken up by solid objects and "capacity" for liquids.

We measure volume by using a unit that has volume to it. The standard metric system unit that's easiest to handle is a cube with sides 1 cm long.

For each of the following objects, make a neat stack or series of stacks of cubes that is as close to the same size in length, width and height as possible to the item you are measuring. Then carefully take the stack apart and count the cubes to find the volume. Record your results in the chart below. Make sure to record what size your units are, too! Fill in the blank "object" spaces with things you have in your environment.

Things that are rectangular prisms will be the easiest to measure! Why is that? _____

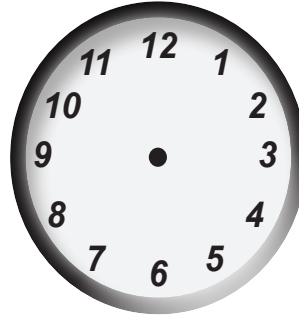
Object	Estimated Volume	Width	Length	Height	Measured Volume
book (about 1 cm thick)					
large toy block					



Time Intervals



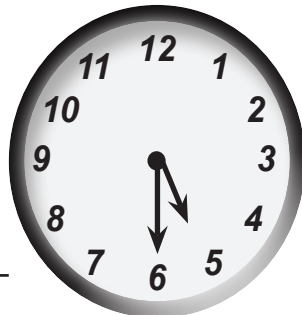
1. a) It takes eight minutes to bake a sheet of cookies. If the first tray goes in at 9:15, draw hands on the first clock face to show what time it comes out.

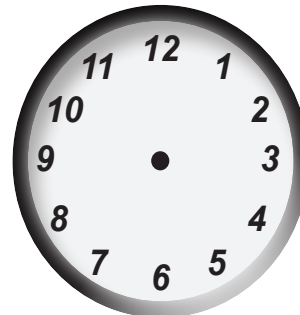


- b) If a second tray gets put in as soon as the first comes out, draw the time when the second tray comes out of the oven on the second clock face.

- c) How long will it take to bake 6 sheets of cookies? _____

2. a) When Kim gets to soccer practise, the clock looks like the one on the left. Write the time beside that clock.





- b) Warm-up, practise and cool-down take 52 minutes. Draw the clock hands when it's time to go on the right clock face.

3. The washer takes 22 minutes. It stopped at 3:25; when did it start? _____

4. Pat and Alex are going to watch a movie. It starts at 2:00 and ends at 3:26. How long is the movie? _____

5. The play is supposed to start at 8:00 pm but is delayed by 5 minutes. The first half lasts 42 minutes. Write the beginning and ending times of the first half of the play in digital clock format. _____; _____

Practise:

Draw or write the start and stop of time intervals to show their length. You can also map them with your finger or a pointer on a clock face.



Elapsed Time



1. Suppose you wake up at 7:00 and have to be ready to go to school by 8:00. It takes 10 minutes to eat breakfast, 5 minutes to brush your teeth and wash up, 15 minutes to get dressed, 15 minutes to get all your school things together and another 5 minutes to get your coat and boots on.
 - a) How much time does this take altogether? _____
 - b) Will you be ready in time? _____ c) Do you have any time to spare? _____
2. a) Kim and Jan are making 3D painted wooden decorations. They need to let the glue dry for 3 and a half hours before painting and let the paint dry for 2 hours. It takes them 25 minutes to get the parts glued and 40 minutes to paint everything. How long does it take to get this far? _____
 - b) If they start at 1:00, what time will the decorations be done? _____
 - c) Use this space to make a timeline for Kim and Jan's decorations. Draw in the intervals for gluing, painting and drying in proper order, and write in what times they start and end at:
3. Terry's family will spend 5 weeks of the summer break at their cottage. How many days is this? _____
4. Sunny spends 20 minutes a day practising music. How long does Sunny practise over a week? _____
5. It takes 70 days for Pat's bean plants to grow and produce beans. How many weeks is that? _____
6. The summer growing season is from the start of May until the end of September where Sam lives. How many months is this? _____
7. Lou was born 3 years and 7 months ago. How many months is this? _____



Years, Decades, and Centuries



Ten years is called a “decade” and 100 years is called a “century.”

1. Do you know anyone who has lived for a decade? _____

Who? _____

2. Do you know anyone 2 decades old? _____

Who? _____

How many years is this? _____



3. Do you know anyone who is 5 decades old? _____

4. How about a century? _____

5. How many decades old is the oldest person you know? _____

How about the oldest animal? _____

6. How many decades are there in a century? _____

7. a) If there are 4 seasons in a year, how many are in a decade? _____

b) How many seasons are in a century? _____

8. How many months are there in a century? _____

9. a) A leap year, where February has an extra day, happens once every four years.

How many leap years are there in a century? _____

b) Why can't you so easily give an answer for how many leap years there are in a decade? _____

10. a) Canada was founded in 1867. How many years ago was that? _____

b) About how many decades? (“About” means you can use rounding!) _____

c) Describe Canada's age using centuries: _____

