

At-Home Investigation

Come up with a plan to measure the perimeter of your lounge room and your bedroom

My plan: answer these questions

- Look at the lengths that you will have to measure for each room. What problems can you see? Come up with a plan for measuring the length of each wall without having to move your furniture.

- How will I make sure that I am measuring accurately when there is furniture in the way? What would happen if I didn't measure straight along?

Carry out my plan: follow these steps and answer the questions

- Measure each room and calculate the perimeter. Explain how you did it in the space below and give the final measurement for each.

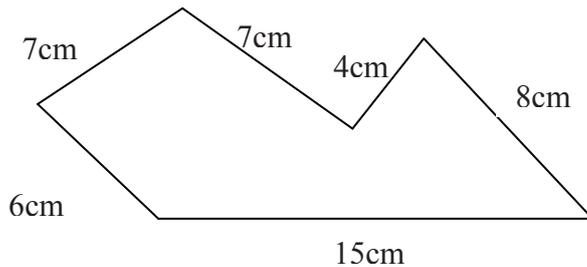
Extend your learning: follow this step and answer the question

How would you write the perimeter of each room in centimetres? How about millimetres?

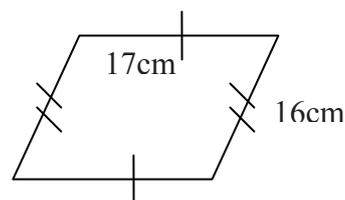
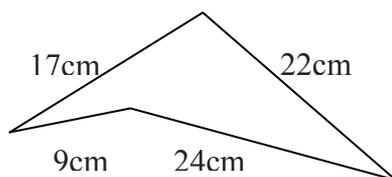
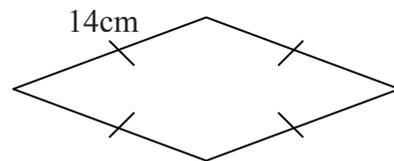
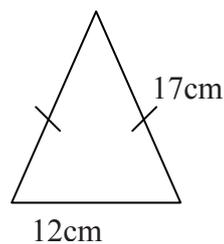
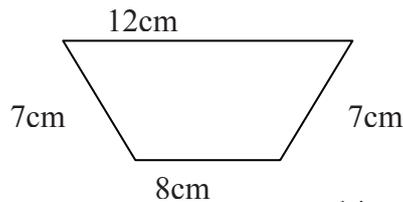
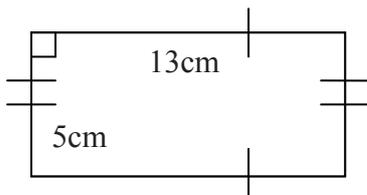
E2. Find the perimeter and adding length measurements

□ Last time that you were examining perimeter, you worked out how to find the perimeter of a variety of shapes. Use the example below to remind you how to calculate the perimeter of any straight-sided shape, and answer the questions.

1. What does “perimeter” mean?
2. In the shape below, the perimeter is 47cm. How did we work it out?



3. Use this to calculate the perimeters of the shapes below:



BACKWARDS QUESTION:

If the perimeter of two squares side-by-side was 60m, what was the side length of one square?

If the perimeter of a rectangle was 20cm, how long could its sides be?

X	3	4	5	6	7	8	9
3							
4							
5							
6							
7							
8							
9							

Record your time here for the 49 questions:

Mark your answers using a calculator or with an adult. Circle any that are wrong.

Ei. Measure and estimate length

 Sometimes we need to guess how long something is so that we know if our measurement is about right. Answer these questions using cm and m.

For measuring your hat size:

1. What instruments could you use to measure it?
2. How accurate does your measurement need to be? Is there a situation in which a high level of accuracy would be required for this measurement?
3. Would you measure it in millimetres or centimetres or both? Why?
4. Have a guess: what do you think the distance will be? Why?
5. Choose an instrument and measure it. What did you get?
6. How good was your guess?

For measuring the distance of your 400m running track:

1. What instruments could you use to measure it?
2. How accurate does your measurement need to be? Is there a situation in which a high level of accuracy would be required for this measurement?
3. Would you measure it in metres or centimetres or both? Why?
4. Have a guess: what do you think the distance will be? Why?
5. Choose an instrument and measure it. What did you get?
6. How good was your guess?

How did you decide which unit to use?

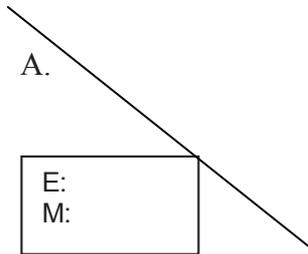
How did you decide on the accuracy required?

BACKWARDS QUESTION:

If the distance around a square measured 50cm, how long would one of the sides be?

 Estimate the length of the following lines using millimetres then measure them with your ruler. Record your results in the box next to each line.

A.



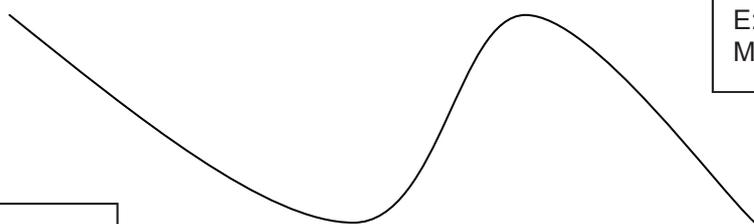
E:
M:

B.



E:
M:

D.



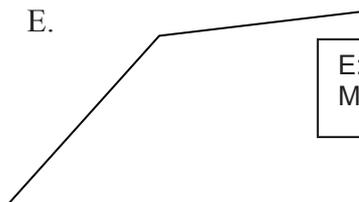
E:
M:

C.



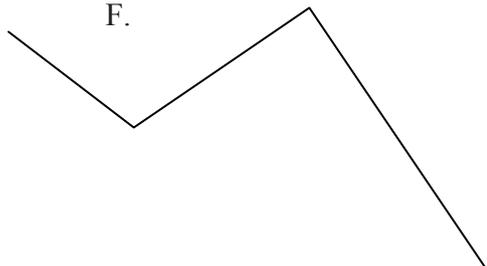
E:
M:

E.



E:
M:

F.



E:
M:

REFLECTING QUESTION:

What did you find difficult when attempting to estimate and measure the lengths above?

Draw a line in this space with a length of 22cm:

Interleaved practise

Number:

- Complete the following number sequence: 2, 4, 7, ____, 16, ____, ____, 37
Describe the number pattern.
- $12\,478 + \underline{\hspace{2cm}} = 13\,603$
- Read this number and say it: 12 403 048. Write it in words. How many millions, thousands, hundreds, tens and ones does it have?
- If you purchased a t-shirt for \$27.80 and a cap for \$12.25? What coins and notes could you use to pay for them? Show two different combinations you might use.
- What is one third of 42? Show how you could work it out using counters. Draw what you did.

Measurement/Geometry:

- Find 3 items in your pantry that are measured in kilograms. List them from lightest to heaviest and write their mass in grams.
- What time is it? You want to watch a television show at 16:30. How long do you have to wait for it to start?
- Describe what happened to shape 1 to make it look like shape 2.



Chance/Data:

- What is the weather most likely to be like tomorrow if there is a 25% chance of rain? How else could the chance of rain have been described?

E13. Converting between units

Converting between different units for length, mass, area and volume is very similar to multiplying and dividing by 10s, 100s and 1000s using place value. In this activity you will use a place value chart to work out how the different units are related.

Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones (then decimal)	tenths	hundredths	thousandths	ten thousandths	hundred thousandths	Millionths

Instructions:

- The standard unit for length is called a metre. Write the symbol for metres in the ones column because it is the unit on which all other length measurements are based.
- How many centimetres are there in one metre? Use this to work out which column is the centimetres column. Write the symbol for centimetres in this column. *Check: if you put a one in this column and then fill in the relevant zeroes and decimal points does it show how one centimetre converts to one metre?*
- How many millimetres are there in one metre? Use this to work out which column is the millimetres column. Write the symbol for millimetres in this column. *Check: if you put a one in this column and then fill in the relevant zeroes and decimal points does it show how one millimetre converts to one metre?*
- How many kilometres are there in one metre? Use this to work out which column is the kilometres column. Write the symbol for kilometres in this column. *Check: if you put a one in this column and then fill in the relevant zeroes and decimal points does it show how one kilometre converts to one metre?*

To work out how many of one unit there are in a second unit:

- Place the number of units that you have in the relevant column (e.g. if you want to change 5cm to something else, put a 5 in the cm column). Pay attention to place value, and only put one digit in each column (e.g. if you want to change 125cm to something else, put the 5 in the cm, the 2 in the column to its left, and the 1 in the next column to the left).
- Place a decimal point at the end of the number in the column that you want to convert the measurement into (e.g. if you are converting into metres, place a decimal point just after the number in the metres column). If there isn't a number in that column already, place a zero in the column and then put the decimal.
- Fill in any zeroes that are missing between the numbers then read off your answer.

Try these:

$$5\text{cm} = \underline{\quad\quad} \text{m} \quad 5\text{mm} = \underline{\quad\quad} \text{m} \quad 5\text{m} = \underline{\quad\quad} \text{cm} \quad 5\text{m} = \underline{\quad\quad} \text{mm}$$

$$5\text{cm} = \underline{\quad\quad} \text{km} \quad 5\text{km} = \underline{\quad\quad} \text{mm} \quad 5\text{cm} = \underline{\quad\quad} \text{mm} \quad 5\text{km} = \underline{\quad\quad} \text{cm}$$

$$72\text{cm} = \underline{\quad\quad} \text{mm} \quad 72\text{km} = \underline{\quad\quad} \text{cm} \quad 72\text{mm} = \underline{\quad\quad} \text{m} \quad 72\text{m} = \underline{\quad\quad} \text{km}$$

Operations:

When changing between the different units, you are actually performing an operation of multiplication or division. The number of places between the two units that you are converting tells you whether you are multiplying or dividing by 10, 100, 1000 or more. To work out the patterns in this change answer the following questions:

1. When you were converting between cm and m, how many places did the decimal point move? e.g. 5cm = _____m.
2. Why do you think it moved this many places? What does multiplying and dividing by 10, 100, 1000 or more have to do with this?
3. What is the pattern between how many cm there are in one m and the number of places that the decimal point moved?
4. Are cm bigger or smaller than m? And is your answer bigger or smaller than your starting number? What is the pattern?

So therefore to convert from one unit to another I need to work out:

1. How many of the one unit there are in the second unit. This should tell us the factor (10, 100, 1000 or more) that we are multiplying or dividing by.
2. Whether the answer should be bigger or smaller. This should tell us whether we are multiplying or dividing by that factor.

Try it out:

1. Change 35m to cm:
 - a. How many cm in one m?
 - b. Should the answer be bigger or smaller?
 - c. So the operation is: _____
2. Change 35mm to cm:
 - a. How many cm in one m?
 - b. Should the answer be bigger or smaller?
 - c. So the operation is: _____
3. Change 35km to m:
 - a. How many cm in one m?
 - b. Should the answer be bigger or smaller?
 - c. So the operation is: _____
4. Change 35cm to km:
 - a. How many cm in one m?
 - b. Should the answer be bigger or smaller?
 - c. So the operation is: _____

Summarise what you have learned about changing between different units of length here:

Your job now is to work out how to change between the different units for mass, volume and area using the same process. When you have worked it out, write some steps for yourself to remember here then answer the questions that follow.

To convert between tonne, kg and g:

To convert between kL, L and mL:

CHALLENGE QUESTION:

To convert between hectares, m^2 and cm^2 :

Try these:

Change:	into:	and also into:	How I did it:
35kg	g	t	
35g	kg	t	
214mL	L	kL	
214L	mL	kL	

BACKWARDS QUESTIONS:

$103m^2$	cm^2	Ha	
23.4cm	mm	m	
0.7cm	m	km	