Work Program for B2FMaths@Home Week 1 Year 5

Contents – click on the link below

How to use this work program

Accessing the online resources

To access the online resources, please go to: https://www.backtofrontmaths.com.au/b2fmathshome

Running the program each week

Each week is designed with five maths lessons so that you can do it each day. Different days have different types of lessons to make sure that students experience the kind of thinking that they need to continue growing in maths. The types of lessons include:

- **At-home investigation:** This is a hands-on task where students explore a new idea before they are taught that skill. They need to come up with an idea to try to solve the problem, try out their idea, decide if it worked or not, try again if needed, and explain what they did. If your child has time with your teacher with a webcam, the teacher will generally be doing this lesson with your child. This is the lesson that will require the heaviest input from you to help your child think through an idea and generally requires the use of some hands-on materials that are listed in the information page.
- **Connecting lesson:** This type of lesson has questions that lead students to develop their ideas and learn a new skill. It should be fairly easy for a student to do, but you will need to be available to read the question to your child as needed, encourage them to think further, and make sure that they complete the work. Most of these lessons will include 10 minutes of practising number operations or concepts through activities or games.
- **Interleaved practise lesson:** This type of lesson provides 8-10 questions from different areas of maths so that students practise remembering what they have previously been taught. Some of the questions may not be easy for your child, so feel free to help whenever you see them struggling.
- **Generalising lesson:** This lesson contains some extension material for use if your child found the week's lessons too easy. *If you would prefer*, you can spend this lesson playing more of the number games that are included in the connecting lesson or giving your child time to complete any of the lessons that they have not yet done.

Getting help

The website above will have answers to frequently asked questions as well as videos to help you successfully teach your child at home. If you have further questions or need support, please contact your child's teacher directly using the contact details that they have provided to you. If they can't answer your questions, they will contact the B2FMaths@Home team directly to get an answer within 3 days.

What you need to know this week

Week overview

This week we are teaching the concept of Length. In upper primary, this means measuring accurately in centimetres and metres, as well as millimetres where appropriate. It also means calculating the perimeter (length around the outside of a shape). Finally, students move on to converting between metres, centimetres, millimetres and kilometres. Please note, there is a video on the webpage to help you understand this concept.

Students need to work out:

- A metre is the base unit for length measurement. We know this because there is not a prefix in front of the word metre (e.g. *centi*metre, *milli*metre).
- All of our measurements involve using multiples of ten.
- Cent means 100th (there are 100c in $1). That means that 100cm = 1m.
- Milli means 1000th. That means that 1000mm = 1m. It also means that 10mm = 1cm.
- Perimeter is a measure of length. It is the distance around the outside of a 2D shape or 3D object.

We are also hoping that students will learn:

- One length can be written in different units (e.g. a wall length of 2.4m would be recorded as 2400mm by a builder as they work in millimetres)
- To compare lengths, we need to make sure that we are using the same units.

You will need the following objects:

- A ruler or measuring tape

Teacher Overview

Students will consolidate understanding of cm and m, introduce the units mm and km, then learn to convert between the units.

Ideally, we would use the following sequence of thinking to develop the concept of length from Year 3 to Year 6:

1. Work out that there are 100cm in each metre (Year 3).
2. Measure length accurately using cm and m (Year 4).
3. Work out that perimeter is obtained when all length measurements are added together.
4. Understand the relationship between m, cm, mm and km, and link this with an understanding of place value including decimal numbers (Year 5-6).

What to emphasise

If you have time online with a webcam
Ask students questions that emphasise the "students need to work out" section from the previous page, such as asking them to explain how they used their metre strip to measure the floor. Watch them measuring their desk or a piece of paper to check for gaps, overlaps etc. Ask them to explain what they found difficult in the At-Home Investigation.

Check that the parents have completed the number tasks with their students to ensure that they are emphasising place value and operations.

If you have only email or phone contact
Check that parents have read the "What you need to know this week" section. Check that they understand the importance of completing the number tasks so that students retain what they have learned and think regularly about place value and operations.

Tracking student achievement

Check the parent's comment on the At-Home Investigation. Check Wednesday's lesson. Has the student measured length accurately using metres and centimetres?

- If so, tick **M4C** on the tracking sheet. For an A: students need to also connect units of length. Tick **M4A**.
- Can they calculate perimeter of rectangles? Tick **M5C**. For an A: students need to also calculate perimeter of shapes made up by combining rectangles. Tick **M5A**.

Monday: At-Home Investigation

You will need:
- A measuring tape or ruler
- Clear space along the floor wherever possible

Steps:
1. Make sure you have read "What you need to know this week" so that you know what to emphasise with your child.
2. Read the sheet to your child. Ask for their ideas on how to solve the problem. Don't give your opinion just yet on their ideas, even if they are clearly wrong.
3. Make sure that you try out their ideas first before you try to help them come up with a better plan. This is important because then they will know *why* their idea didn't work.
4. Help your child think about what worked and what didn't, then come up with a new plan if needed.
5. Encourage your child to draw or write answers to the questions on the page.
6. Discuss what your child found out with them. Keep in mind the ideas from the "What you need to know this week" section so that you can ask questions that are appropriate to the issues identified.
7. We will be coming back to measuring perimeter again later in this program, so don't worry too much if today didn't quite work.
8. If your child found this task easy, ask them to convert the perimeter to centimetres or millimetres. There is a video on the website to demonstrate converting between units of measurement.

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?

Teacher Overview

This is a ***Problem Solving*** task.

The emphasis is on *designing* an investigation, *developing* a plan, *testing* it out, *verifying* that the plan worked, changing it as needed and *communicating* the procedure. There is also an emphasis on *generalising* an appropriate process that can be replicated when measuring the length of other objects.

This task will be tricky to run via a webcam, but you can probably talk to kids about what they did and what they found AFTER they have tried the investigation. Try to stick to the ideas in the section on “What you need to know about this week”.

Watch out for:

- Accounting for furniture – maintaining a straight path
- Measuring accurately using both cm and m
- Adding accurately

Good questions to prompt thinking:

- Which part of room will we have to measure?
- What will we do if there is a couch in the way? Can we just bend the line and measure the whole way around the couch?
- If we are going to compare the perimeter of each room, how do we keep track of what we are doing and how long each wall is?

Students requiring support:

- Start by just asking students to measure the length of one room.
- Next, ask students to compare the lengths of two rooms rather than calculate the perimeter.
- Next, try asking students just to calculate the perimeter of their table.

Extension:

- Encourage students to convert between units of length.
- Encourage students to draw their room to scale.

Tuesday: Connecting lesson

You will need:

- A ruler that shows centimetres.

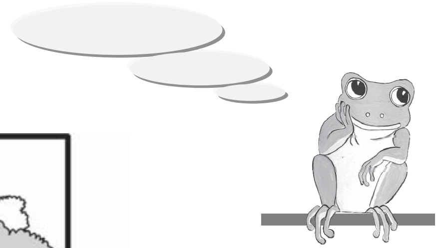
Steps:

1. Make sure you have read "What you need to know this week" so that you know what to emphasise with your child.
2. Read the sheet to your child. Ask for their ideas on how to design a path.
3. Encourage your child to think about how they can calculate the length of their path without having to measure the whole way (each line is 3cm, so count up how many lines were used and multiply by 3).
4. On the second page, encourage your child to think about the words, "path" and "perimeter", working out that perimeter is the path around a shape or object.
5. Revisit the thinking that you did yesterday with your child. Now that they have a better understanding of perimeter, what would they change?

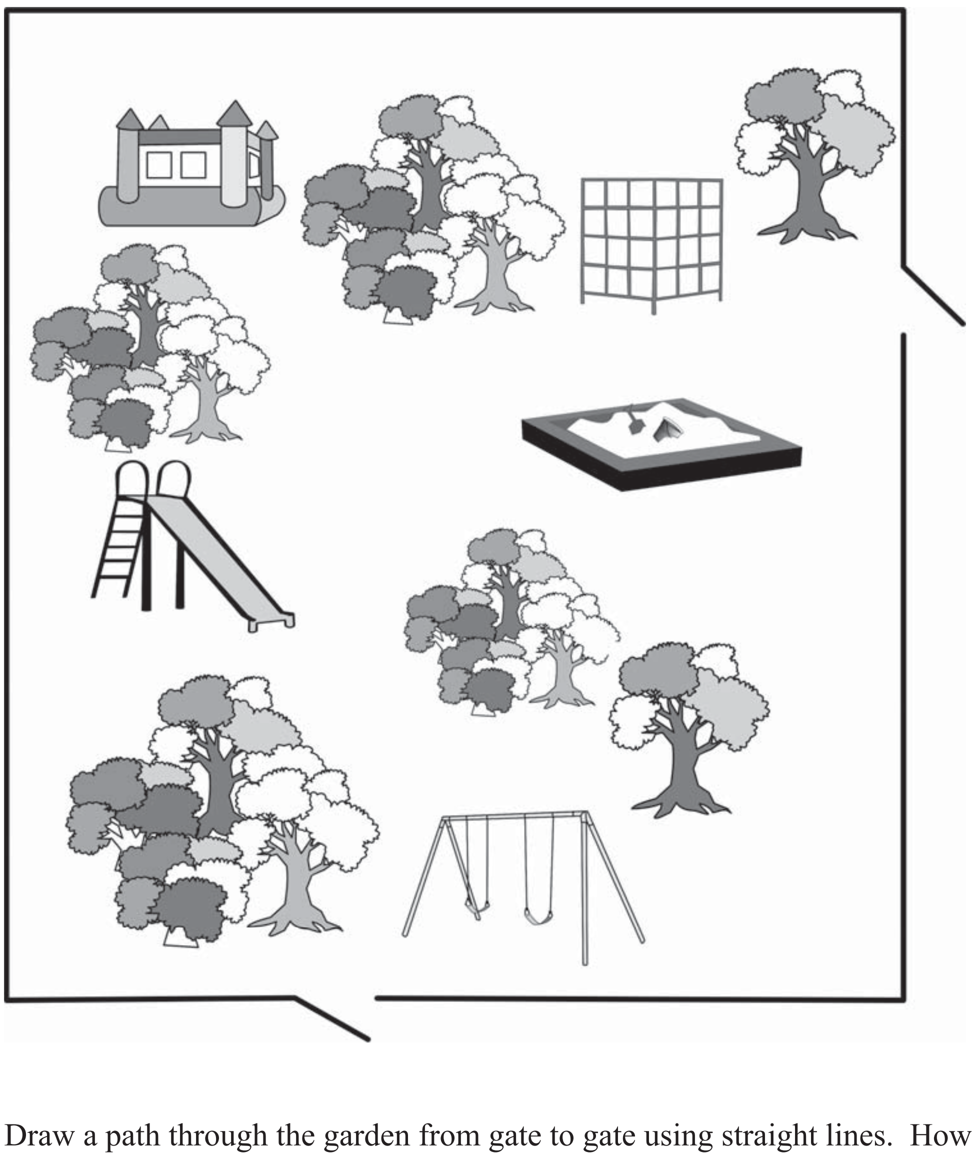
Problem 18: Measuring Perimeter

TR p90

A garden is pictured below. Planners are working out the best way to make a path through the garden (gate to gate) past all the play equipment. They must use straight lines 3m long. Design a path through the garden and work out how long it is. Answer the questions that follow.



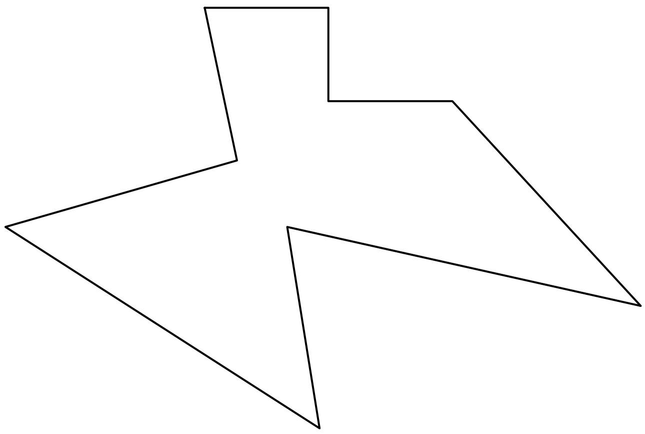
Our garden uses the scale 1cm = 1m



Draw a path through the garden from gate to gate using straight lines. How long is your path? How did you work it out?

Now join your path back up to the start instead of going out the second gate. Use a different colour. The length of this path is called the perimeter. Work out the perimeter of your revised path. What is it and how did you work it out?

The following shape has a perimeter too. Work out what you think the perimeter is and explain how you found it.



Communicating:
How did you work out the perimeter? What operations did you use?

Understanding:
If you had a different shape, how would you work out the perimeter?
How do you know that this is the right way to work out the solution?

Manipulation problems:
If a square had a side of 5cm, what would its perimeter be?
How did you solve it?

If a regular hexagon had a side of 8cm, what would its perimeter be?
How did you solve it?

Teacher initials:

Date:

Problem solving / T&R:
- Problem solved with minimal or non-mathematical prompting
- Some leading questions were used to prompt thinking
- Solved after explanation
- Did not work out solution
- N/A- not a novel problem

Reasoning / Comm.:
(verbal, written, working and equations, or visual representations)
- Clearly and logically reasoned
- Easily understood
- Understood with some interpretation needed
- Some gaps but on topic
- Minimal or off topic

Understanding / Reflect:
- Connected manipulation problems to previous questions and answered easily
- Connected manipulation problems to previous questions with some prompting, and answered correctly
- Answered once the similarities to previous questions had been pointed out
- Had some problems in answers but was on the right track
- Did not answer appropriately

- Student not observed

Teacher Overview

This is an ***Understanding*** task.

The emphasis is on *connecting* the idea of path length with perimeter.

This task will be relatively easy to run via a webcam. Focus on the connections and try to have students link the idea of multiple measurements that are the same length (e.g. they might have used 5 lengths, so multiply by 5).

Watch out for:

- Using the same lengths in the park task
- Adding the lengths on page 2
- Working out a formula for the manipulation problems

Extension:

- Encourage students to develop an equation for the manipulation questions using what they know about regular shapes.

Wednesday: Connecting Lesson

This lesson allows your child to practise and consolidate what they have learned about perimeter over the past two days.

Number practice: *Multiplication facts*
Ask your child to complete one of the multiplication grids at the bottom of this page. Be aware that this might take a considerable period of time the first time around. Hopefully in a few weeks you will find that the time taken is much shorter.

Worksheet task: 15-20 minutes
You will need a ruler. This lesson is following on from what your child learned yesterday about with perimeter.

Make sure that your child **explains out loud** how they calculated the perimeter of each shape as this means that they will be more likely to remember it later.

At the end of this lesson:
Your child has now had 3 opportunities to try calculating perimeter. You will need to decide if they have mastered this concept or not. If they can, then on Friday do the extension task which involves converting between units of length. If they are having some trouble or forgetting the process, use the time on Friday to practise perimeter again.

Multiplication Practise:

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

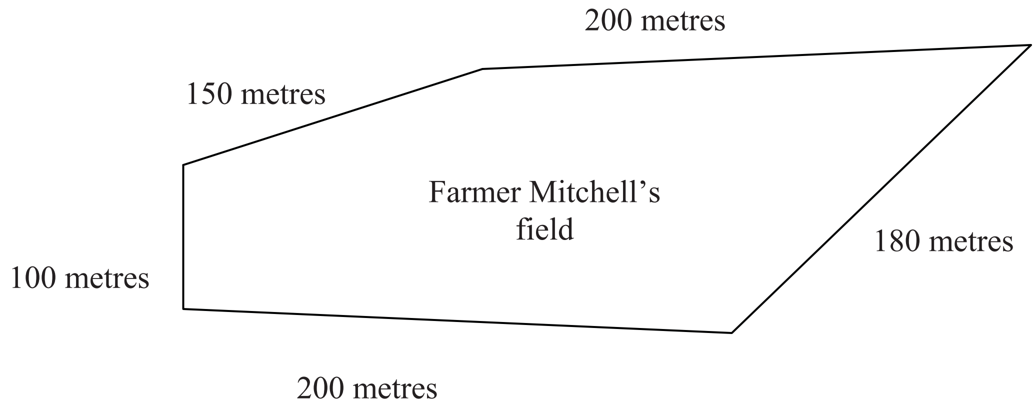
Record your time here for the 49 questions:

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

E4. Measuring boundaries

TR p99

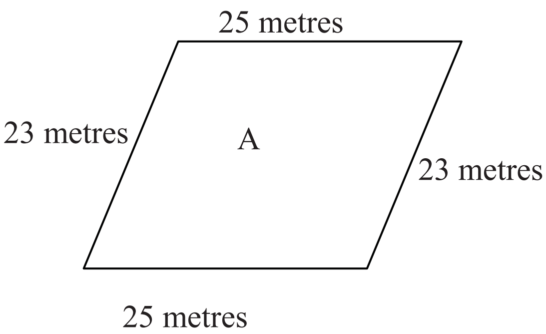
Farmer Mitchell needed to find the distance around his paddock so that he could fence it. He didn't have anything long enough to reach around the outside, but he did know the length of each side of the field. Below is a diagram showing his field. Use it to help you answer the following questions.

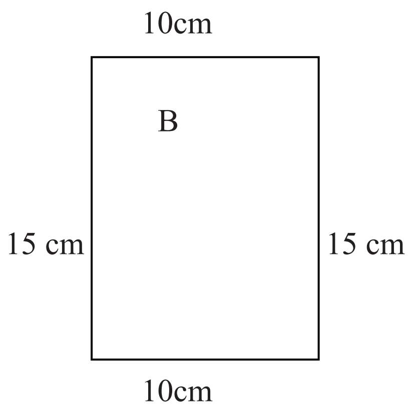


1. Farmer Mitchell worked out that the **perimeter** around his field was 830 metres. How did he work this out?

2. How did he work out what the **perimeter** was?

3. Use the same method to work out the **perimeter** for the following shapes:





1. What do you think **perimeter** might mean?

2. How could you check? Go and check your understanding of what **perimeter** means.

3. Are you right?

4. How would you work it out what the **perimeter** was for other shapes?

Teacher Overview

This is an ***Application*** lesson. It gives students another chance to develop appropriate measuring of perimeter. At the end of this lesson students need to be able to calculate perimeter of rectangles to meet the Achievement Standard. They do not need a formula. They should also start to convert units of length in order to move on to the lesson for Friday.

Other considerations:

- Check that the student has completed the number task and remind parents that it is important.
- If the student can correctly calculate perimeter of rectangles, try shapes formed from multiple rectangles as this is an A standard.

Thursday: Interleaved Practice Questions

Why we are using mixed up questions:
In this lesson your child will be reviewing a range of skills that they have learned previously. Each question is unrelated to the previous question, because we want your child to have to *think hard* about what to do. Mixing up questions like this, rather than just practising related questions, has been shown in research to improve student retention of concepts by 60% over a 4 month period.

What to expect:
Your child will probably have forgotten how to complete quite a few of the questions. If needed, change the numbers in each question to make them easier because this will still require your child to think hard and remember a process. If they still can't work it out, feel free to show them, but try using different numbers rather than the exact same question. There are answers to each question on the website in case you get stuck.

Interleaved practise

Number:

1. Complete the following number sequence: 3 , 6 , ___ , ___ , 15 , ___ , 21

2. 12 478 + ____ = 13 623

3. Read this number and say it: 2 423 048. Write it in words. How many millions, thousands, hundreds, tens and ones does it have?

4. What change would you get from $50.00 if you purchased a t-shirt for $27.80? Show two different combinations of dollars and cents that you might receive.

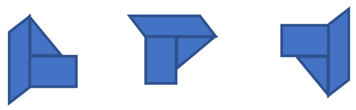
5. Share 48 counters equally to show halves. How many other ways could you share the counters? Draw them and describe the groups you have made.

Measurement/Geometry:

6. Find 4 objects that would be measured in kilograms. Find 4 objects that would be measured in grams. List them in order from heaviest to lightest.

7. What time is it? What time will it be in an hour and half? Write both times using 24-hour time.

8. Draw what the next shape in this sequence would look like. Describe how you worked it out.



Chance/Data:

9. What could the weather be like tomorrow? List as many possibilities as you can. Write them in order from most likely to least likely.

Teacher Overview

The questions on this worksheet are drawn from the "C standard" of the Achievement Standard. See your tracking sheet for more detail. Each week the interleaved questions will get a little harder, and more concepts will be reviewed throughout the program as we teach that concept. We have included answers to these questions on the B2FMaths@Home so that parents can find them if needed.

Support for struggling students:
You might like to try the Interleaved questions from a lower year level, or simply reduce the numbers in the questions. You might also give the student the answer then ask them to work out how the answer was obtained.

Friday: Connecting Lesson

You will need to decide between the following options:

- Child found the perimeter work easy: Watch the video on the website about converting units of length and complete the activity sheets provided. You will need a calculator for this lesson.
- Child found the perimeter work hard: practise this skill again, particularly for rectangles.

E12. Converting between units for length

TR p102

Examine the pattern below and work out what operations were used to change between units for length.

Pattern: centimetres to metres

1. How many centimetres are in a metre?
2. Put the answer for question one in the box below.

On your calculator press the following buttons:

100 operation $\boxed{\qquad}$ =

Choose any operation from + - x ÷
You should keep trying different operations until you get **1** as the answer.

3. Which operation worked?

Now try out your operation on these to check if you get the right answers:
154cm = 1.54m 267cm = 2.67m 521cm = 5.21m 893cm = 8.93m

4. What do we do to change from centimetres to metres?

Pattern: millimetres to metres

1. How many millimetres are in a metre?
2. Put the answer for question one in the box below.

On your calculator press the following buttons:

1000 operation $\boxed{\qquad}$ =

Choose any operation from + - x ÷
You should keep trying different operations until you get 1 as the answer.

3. Which operation worked?

Now try out your operation on these to check if you get the right answers:
1534mm = 1.534m 2525mm = 2.525m 5598mm = 5.598m 8275mm = 8.275m

4. What do we do to change from millimetres to metres?

Pattern: metres to kilometres

1. How many millimetres are in a metre?
2. Put the answer for question one in the box below.

On your calculator press the following buttons:

Answer from question 1

1000 operation [ ] =

Choose any operation from + - x ÷

You should keep trying different operations until you get 1 as the answer.

3. Which operation worked?

Now try out your operation on these to check if you get the right answers:

1534m = 1.534km 2525m = 2.525km 5598m = 5.598km 8275m = 8.275km

4. What do we do to change from metres to kilometres?

Complete the following statements showing how to change units:

To change:

From centimetres to metres ______________________________

From metres to centimetres ______________________________

From millimetres to metres ______________________________

From metres to millimetres ______________________________

From metres to kilometres ______________________________

From kilometres to metres ______________________________

Backwards Question:

Your teacher will now draw a curved line on the blackboard for you to measure. You need to record how long it is in millimetres, centimetres and metres. Do you need to measure it three times? Explain how you could work it out:

Teacher Overview

This is a ***Conceptual Understanding*** and ***Reasoning*** lesson. It is designed to extend student understanding further and encourage students to begin converting between units of length.

A video is provided about this concept on the website. Watch it to build your own understanding of the link between place value and length conversion.

This activity is required for students to show achievement at an A or B level, but not for a C standard.