Work Program for B2FMaths@Home Week 1 Year 2

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 early primary, this means measuring using **measuring objects** such as shoes, hand prints, blocks or pens rather than using a ruler or measuring tape. It is important that students use the objects before using centimetres because they need experience with the thinking in the "Students need to work out" section below to properly understand measurement.

You will need something to measure one metre in length for lesson 3

Students need to work out:

- Measuring needs to go from the start of an object to the end – you can't start part way along or miss out a bit (e.g. start from the head of the bed and go to the foot rather than half way along)
- A good way of measuring is to use **measuring objects** (e.g. as shoes, hand prints, blocks or pens)
- The measuring objects should be the same size as each other (e.g. you can't use different sized shoes, you should use the same size shoes or use the one shoe and move it along the length while counting)
- The measuring objects should align straight along the edge (e.g. go straight across the bottom of the bed, not on a wavy line)
- The measuring objects shouldn't overlap each other or have gaps between them (e.g. put them end to end without spaces between them)

We are also hoping that students will learn:

- If the measuring object that you use is big, you won't need as many of them to cover the whole length of an object, but you might end up with a gap at the end
- If the measuring object you use is small, you will have a lot more of them in the same length compared to using a big measuring object
- That means that you can't directly compare lengths of objects unless you know how big the measuring object was. For example: if we were measuring height with hand prints, the person with the bigger hand might have fewer hand prints in their height than the person with the smaller hand, even if they were actually taller.
- Sometimes it can be hard to directly measure the length of an object (e.g. measuring your bedroom if there is furniture in the way), so we have to think about what distances might be the same and measure those instead. For example: we might measure from one wall to the centre of the room, then move sideways and measure from the centre to the other wall, then add these measurements together.

You will need the following objects:

- A collection of measuring objects (shoes, hand prints, blocks, toy cars, spoons or pens will work)
- A piece of string that is 1 metre long
- For the number games: an opaque bowl or cup and 20 items that fit under the bowl (e.g. spoons, toy cars, buttons, balls of paper, toothpicks)

Teacher Overview

Students will be using non-standard measuring units to measure length. Parents have been warned not to skip straight to centimetres, but they may try that anyway.

Ideally, we would use the following sequence of thinking to develop the concept of length from Foundation to Year 2/3:

1. Compare objects directly to determine which is bigger (Foundation). Learn that you have to line up the starting points of each object.
2. Compare objects indirectly using a go-between such as a length of string (Foundation). Reinforce the idea of lining up the starting points. Use the go-between as a representation for one of the objects to start abstract thinking about comparison.
3. Use smaller measuring objects and count them as a measure of length. Realise that you have to use the same object (uniform units), align them, go straight, and have no gaps or overlaps if you want to compare lengths.
4. Realise that a bigger measuring object gives a smaller count for length and a smaller measuring object gives a larger count for length.
5. Realise that smaller measuring objects allow for greater accuracy as there are smaller gaps/overruns at the end.
6. Realise that if we are going to communicate with anyone else, we need a standard way of measuring length with units: therefore develop the need for metres and centimetres.

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 shoe to measure the length of their bed. 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 understand how the Partitioning games for the week work and make sure that you ask the student if they have played them yet.

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 using the number games so that students retain what they have learned and think regularly about adding and subtracting.

Tracking student achievement

Check the parent's comment on the At-Home Investigation. Check the table in Wednesday's lesson. Has the student measured each item using the same measuring objects, compared it to the metre string or similar, then ordered them from longest to shortest or vice versa?

- If so, tick **M4C** on the tracking sheet.

Can they measure and order 5 objects? Tick **M4B**.
Can they identify problems when measuring is done incorrectly? Tick **M4A**.

Monday: At-Home Investigation

You will need:

- A collection of measuring objects (shoes, hand prints, blocks, toy cars, spoons or pens will work)
- Clear space along the floor next to your child's bed

Steps:

1. Make sure you have read "What you need to know this week" so that you know what to emphasise with your child and why we are not skipping straight to using centimetres and metres.
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. Scribe for them if you need to.
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. At the end: write a comment on the page in the appropriate section to say what went well or what you are concerned about.
8. We will be coming back to measuring length again later in this program, so don't worry too much if today didn't quite work.

At-Home Investigation

Come up with a plan to investigate how long your bed is, and how long your bedroom is.

My plan: answer these questions

- What could I use to measure my bed with? Draw or list 3 ideas:

- How will I make sure that I am measuring accurately?
  What would happen if I didn't measure straight along?

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

- Choose 2 ideas. Measure your bed in those two ways. How long is your bed?

- Which way worked the best? Explain why.

Apply your learning: follow this step and answer the question

Use what you have learned about measuring to measure the length of your whole bedroom in just one way.

- How much longer is your bedroom than your bed? How do you know?

Parent comment:

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:

- Starting measuring at the start of an item
- Gaps, overlaps
- Using different measuring objects rather than uniform objects
- Not going straight

Good questions to prompt thinking:

- Show me the part that is the length. Use your hand to run along the length.
- Which part of the bed will we have to measure?
- Which measuring objects might work to measure the bed?
- Which objects might work to measure the floor?
- If we are going to compare the length of the bed and the floor, do we need to use the same measuring objects?
- Could you use marbles to find out how long the bed is? Why not? What would be an easier thing to use?

Students requiring support:

- Provide students with opportunities to identify the attributes of objects that can be measured.
- Give students further opportunities to choose suitable units to measure with and ensure they can accurately use the chosen unit.

Extension:

- Ask students to use their chosen unit to measure other objects in the room.
- Encourage them to compare the results they get when they measure their desk with other units. Ask "Why do you have to use more blocks than hand spans to measure your desk?" "What has changed?"

Tuesday: Connecting Lesson

In this lesson, you may need to spend time measuring your own heights by lying down on the floor and using hand prints.

Number game for 10-15 minutes: *Hide and seek partitioning*
You will need: an opaque bowl or cup and 18 items that fit under the bowl (e.g. spoons, toy cars, buttons, balls of paper, toothpicks). You should also have some paper and a pen or pencil for drawing the amounts.

1. Show your child the items and ask them how many there are.
    a. If you child cannot work out that there are 18 objects, reduce the number to 12 and try again.
2. Ask your child to look away or close their eyes. "Hide" more than half of the objects under the bowl.
3. Ask your child to look at how many are left then ask them how many are hiding under the bowl. Allow time for your child to work this out, including needing to use your fingers and their own fingers or draw the amounts.
    a. If your child is consistently wrong, or takes more than 2 minutes to work it out each time, reduce the number of objects and try again.
4. Take it in turns hiding different amounts with your child.
    a. If this is too easy, try using 2 bowls instead of 1 bowl and hiding the same amount of items beneath each bowl.
    b. You can increase the number of items to 16 if needed.

Thinking hard before starting the worksheet:
Start off by lying on the floor and placing an object at the top of your head and bottom of your feet to mark your length. Use your hand prints to measure your length. Then ask your child to use their hand prints to measure your length.

Provoke your child to evaluate the situation by asking, "Did I just grow? The number of hand prints got bigger!" Ask them to explain what happened and what this might mean when you are comparing the heights of people.

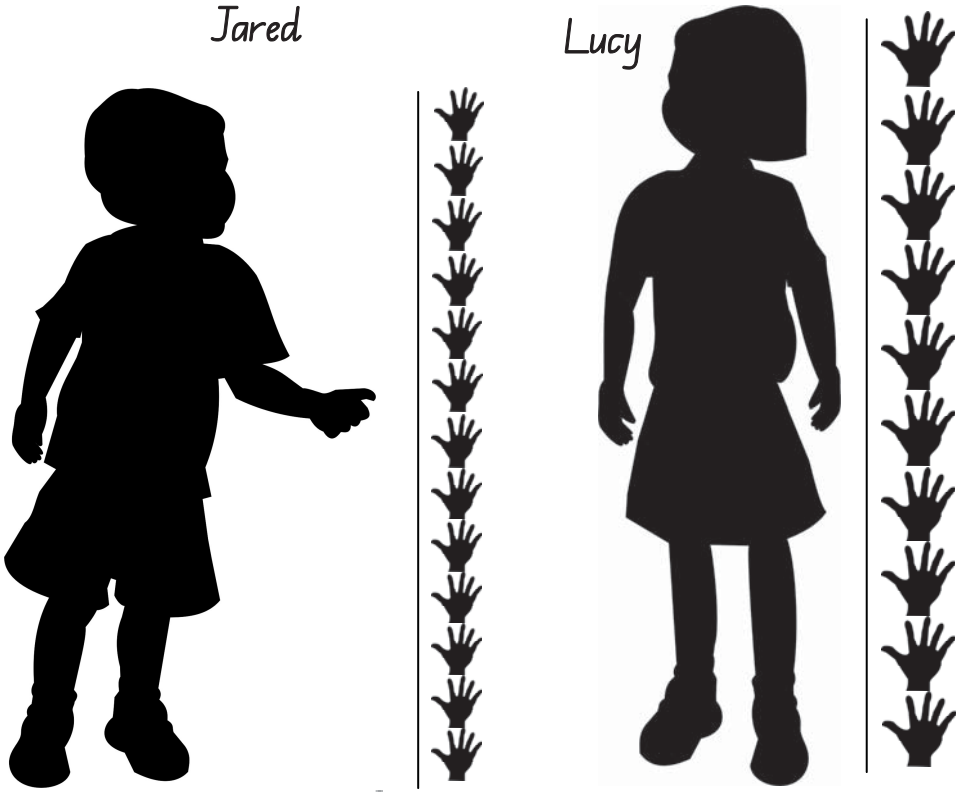
Worksheet task: 15-20 minutes
This lesson is following on from what your child learned yesterday about using **measuring objects**. The purpose of the lesson is to **discuss and evaluate** the size of the hand prints, so that your child works out that the same hand print would be needed for sizes to be fairly compared.

"Use a piece of paper to show how you would fix this" means for your child to draw a hand print, then use the same hand print for each person. Feel free to explain this as needed.

Add a comment if you need to explain how your child went and whether they worked out that you needed to use the one set of hand prints.

Problem 22: Length

Jared is 13 handprints tall. Lucy is 10 handprints tall.



Which child is the tallest?

Jared must be taller than Lucy because he has more handprints.

What problem can you see?

or Show what you think the problem is.

Problem solving:

Teacher initials:
Date:

Student solved the problem with:

- Minimal help
- Some prompting
- Solved after explanation
- Did not work out a solution by themself
- N/A – not a novel problem

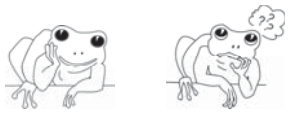
What could we do about it?

or Use another piece of paper to show how you would fix this problem.

Tell a friend how you would fix it.

Peer Assessment

Name:



Teacher Overview

This is a ***Reasoning*** task.

The purpose of this lesson is to *discuss, analyse* and *evaluate* the need for using uniform informal units. Make sure to emphasise discussion of the different sized hand prints rather than just having students tell you their answers or process.

To help students retain the information, make sure that they have *explained their reasons* for measuring using the one set of hand prints to measure their parents. If you have time online with students, ask them if they measured their own height or their parent's heights and what they found.

Wednesday: Connecting Lesson

This lesson allows your child to practise what they have learned over the past two days and introduces the concept of one metre.

Number game for 10-15 minutes: *Making to twenty*
You will need: 20 items from yesterday (e.g. spoons, toy cars, buttons, balls of paper, toothpicks) and the opaque bowl. You should also have some paper and a pen or pencil for drawing the amounts.

1. Show your child the items and ask them how many there are.
    a. If you child cannot work out that there are 20 objects, reduce the number to 10 and try again.
2. Ask your child to look away or close their eyes. "Hide" 10 of the objects under the bowl.
3. Ask your child to look at how many are left then ask them how many are hiding under the bowl. Allow time for your child to work this out, including needing to use your fingers and their own fingers or draw the amounts.
    a. If your child is consistently wrong, or takes more than 2 minutes to work it out each time, reduce the number of objects and try again.
4. Once your child knows there are 10, reveal the objects so that they are arranged into 2 groups of 10. Ask your child write down the numbers in each group as an addition sum (10+10=20).
5. Move one object to the other group, so that you have groups of 9 and 11. Ask how many are in each group now, then write the sum. Emphasise what changed, "this has one more and this has one less".
6. Ask your child, "What would happen if we moved one of these things from the 9 to the 11? What would we have now?". Repeat, working out the amounts and writing the pairs of numbers until you get to 0 and 20.
7. Display the sums and drawings somewhere so that you can refer to it in later lessons (e.g. stick it on the fridge or their door).

Worksheet task: 15-20 minutes
You will need to make something that is one metre long for this task (e.g. cut a string).
This lesson is following on from what your child learned yesterday about using **measuring objects**.
The purpose of the lesson is to **discuss and evaluate** which measuring objects are more useful than others, then to compare the length of objects to one metre.

Make sure that your child **explains out loud** how they used the measuring objects as this means that they will be more likely to remember it later. If your child can identify which item was the longest, please also ask them to order the objects from the shortest to the longest. This is important for your teacher to know, so make sure it is written at the bottom of the page.

At the end of this lesson:
Your child has now had 3 opportunities to try measuring length. You will need to decide if they have mastered this concept or not, by seeing if they can correctly measure then order the lengths of 3 items. If they can, then on Friday do the extension task. If they are having some trouble or forgetting the process, use the time on Friday to practise measuring again.

Application questions

1. Work with a partner. Use a metre ruler to cut a piece of string that is exactly 1 metre in length.
   Take your piece of string with you to find objects that are:
   - less than 1 metre in length
   - close to 1 metre in length
   - more than 1 metre in length

or Fill in the table below.

Things that are less than 1 metre long or	Things that are close to 1 metre long or	Things that are more than 1 metre long or

Choose 4 of the objects you found. Write them in order from shortest to longest.

Find something that is close to the same length as the shortest object you found.

or

Teacher Overview

This is an ***Application*** lesson. It gives students another chance to develop appropriate measuring using non-standard units for length. At the end of this lesson students need to be able to measure and order four objects by length to meet the Achievement Standard. They should also compare the length of objects to one metre so that they start to experience what one metre in length means.

Other considerations:

- Check that the student has played the number game and remind parents that it is important if they haven't played it with their child.
- If the student can correctly measure and order 4 objects, try for 5. That is a B standard.
- If the student can find problems with measuring incorrectly as well as order 5 objects, this is the A standard.
- **At the end of this lesson** you can advise parents whether their child should try the extension task on Friday, or instruct them to do more measuring tasks with their child.

Thursday: Interleaved Practise 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. Starting at 12, count 5s until you get past 40.

2. 26 + ____ = 43

3. Write 48 in words. How many tens and ones does it have?

4. Use 4 coins to make $1.00 and draw them here.

5. Share 12 counters equally to show halves, then quarters. Draw it.

Measurement/Geometry:

6. Find 3 objects. Order them from lightest to heaviest. Write them here.

7. What time is it?

8. Draw a triangle with three different length sides.

Chance/Data:

9. How likely is it to rain tomorrow?

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.

Extension:
Change the starting numbers, the amounts counted by or added, or the number of coins/counters. Ask students to discuss the likelihood of rain in more depth with their parents, including looking up the BOM predictions and discussing how the likelihood is calculated.

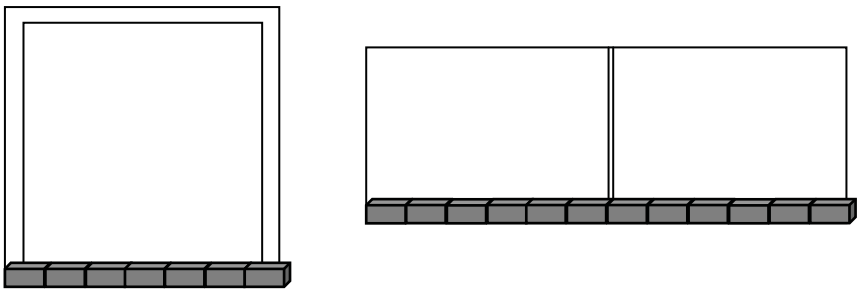
Friday: Generalising and Extending Lesson

You will need to decide between the following options:

- Child found the measuring work easy: Try the worksheet. Make sure that your child is doing the thinking rather than waiting for you to explain. This task emphasises the idea that sometimes we need a mix of large and small items to accurately measure to account for gaps and overlaps.
- Child found the measuring work hard: Use this time to practise measuring other items in your house, then ordering the objects from smallest to largest. Try to make sure that you include objects that are not in the same room as each other (e.g. couch vs your bed), so that your child cannot simply compare them by sight.

Manipulation problem

Britney and Mia measured the classroom door and found that it was more than 6 blocks wide. Then they measured a window and it was almost 12 blocks wide.



How many block lengths of curtain rod will they have to buy to make sure that there is enough rod to hang curtains over the window and the door?

or Show how you worked it out.

Backwards question

Britney measured the length of the blackboard using blocks and found that it was 25 blocks long.
Mia measured the length of the blackboard using the length of her arm from elbow to wrist (forearm) and found that it was 16 and a bit forearms long.

Which one is longer – Mia's forearm or the blocks?

or Show how you worked it out.

Teacher Overview

This is a ***Conceptual Understanding*** and ***Reasoning*** lesson. It is designed to extend student understanding further and promote generalising.

The purpose of the lesson is to *disprove* a wrong idea, *find flaws* with an approach and *evaluate* options. The child has to think about overlaps, which should promote the idea of needing smaller units.

To extend student thinking further:

- Ask students to work out how furniture such as a couch was moved into their house through their doorways. How was their bed moved into their bedroom?
- Ask student to measure their bed with their arm and with blocks. How many blocks make up one arm length?