

Work Program for B2FMaths@Home Week 3 **Foundation**

[Contents – click on the link below](#)

[How to use this work program](#)

Accessing the online resources

Running the program each week

Getting help

[What you need to know this week](#)

Week overview

Students need to work out:

We are also hoping that students will learn the following aspects of number:

You will need the following objects:

Structural stages

Monday: At-Home Investigation

Tuesday: Connecting Lesson

Wednesday: Number focus

Thursday: Interleaved Practice Questions

Friday: Connecting Lesson

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.
- **Number practice:** This lesson contains games and number tasks to do regularly with your child. Number is the most important concept to establish in Foundation, so we will be using similar activities each week to help your child develop a very firm understanding of “how many”, to be able to picture that amount in their head, and to be able to add and subtract small amounts very flexibly. **These sessions will not focus heavily on counting, as counting is far less important than making amounts, drawing those amounts and recognising that the amount is still the same when the objects move.**

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 arrays and counting patterns. In early primary, this means looking for examples of objects being arranged into a grid-like pattern (e.g. tiles or the top of lego blocks).

Students need to work out:

- When we line objects up, or group them, we can count them more easily (e.g. counting shoes in twos instead of individually).
- How to draw arrays (grid-structures) for small amounts, e.g. a square made of 4 smaller squares
- How to count in 2s.

We are also hoping that students will learn the following aspects of number:

- Quantity: The idea of “how many” each number represents. This is very different to counting. We will be focusing on three different elements of quantity:
 - Collecting or making a quantity: Try asking your child to collect a certain number of objects (6 spoons, 8 pencils, 12 cards...). Do this as often as you can, in as many circumstances as you can (e.g. setting out the cups for dinner).
 - Drawing a quantity in a structured arrangement: try asking your child to draw a square made out of 4 smaller squares, or a rectangle with 6 squares in it. You might want to use cube-shaped blocks to model this first.
 - Conserving a quantity: try putting out 8 objects, then moving them around. Ask your child how many there are. Do they need to keep counting to work out that the amount stays the same?
- Partitioning: This is when we break a quantity into two smaller quantities. For example, we could break a group of 8 objects into a group with 3 and another group with 5. If we put those groups back together again, we would have 8.

You will need the following objects:

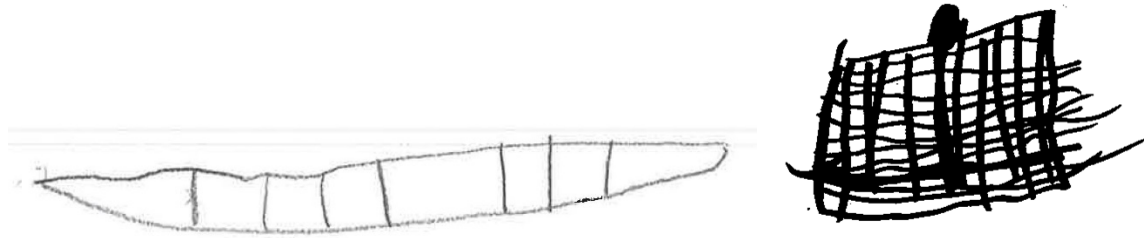
- Lego if you have any, or similar bricks that have dots arranged across the top
- An egg carton if you have one, and small objects to fit in each of the slots (coins, buttons, small toys, counters from a board game, bottle caps)
- Print out of the squares, or if you have small cubes (like dice) then use those instead

Structural stages

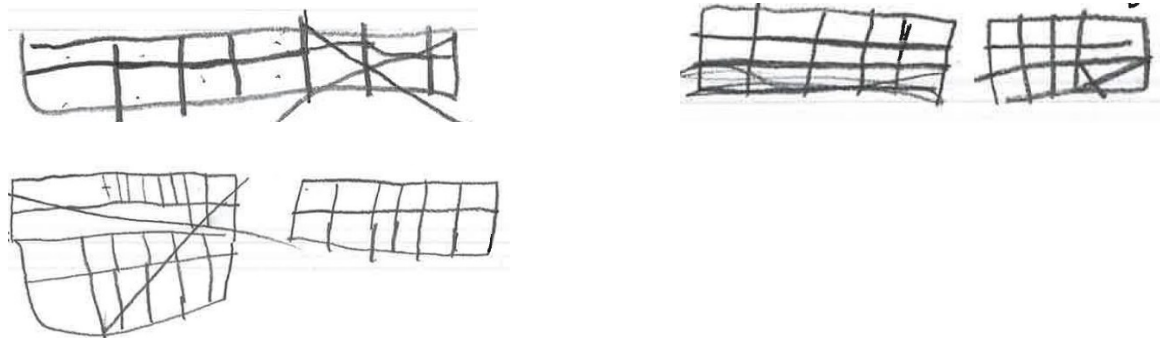
Look at your child's drawings to determine what structural level they are at. Emphasise moving to the next structural stage rather than drawing larger amounts. For teachers: Joanne Mulligan has more information on developing structural thinking in the [PASMAT research available online](#).

Each of the drawings below is of a tens frame (rectangle with 2 rows of 5), drawn by a child who is familiar with tens frames but can't see one. Each drawing was completed by a child aged between 5 and 8.

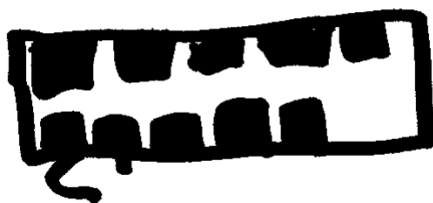
Prestructural: does not have 10 squares, not arranged in to correct number of rows or columns



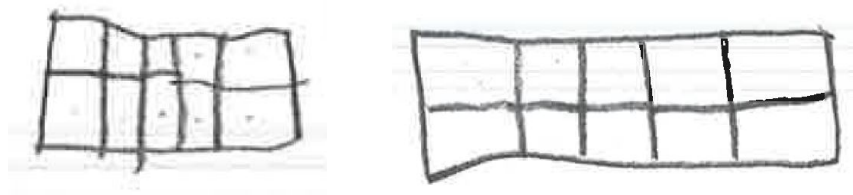
Emergent: correct number of rows or columns, but not both, or just 10 in one line but without 2 rows



Partial structural: can draw 10, but not also keep the structure of rows and columns, often this means 2 rows of 5 but not having the squares touching



Structural: both drawings show structural thinking, however the dots on the images show that the child needed to check that there really were 10



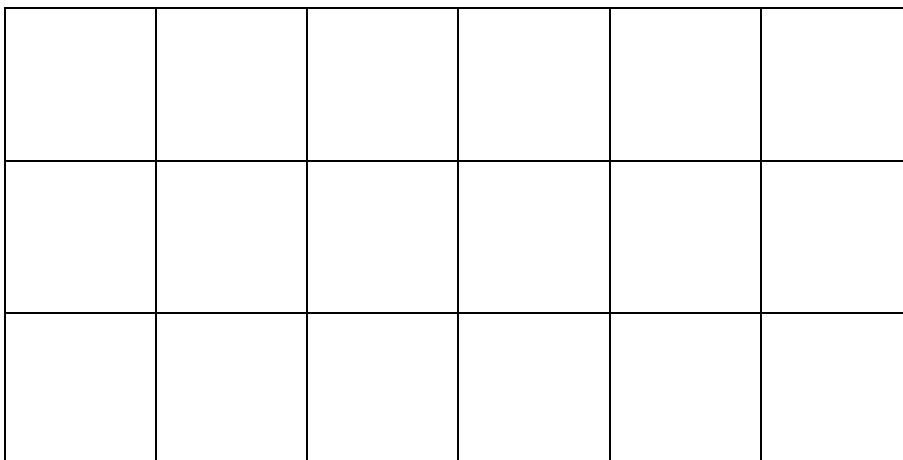
Monday: At-Home Investigation

You will need:

- 8 small cubes, or cut out the squares below to use instead
- A tea towel or piece of paper to cover the cubes or squares
- Lego blocks with 8 dots if you have them

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 problems. Encourage them to move the squares or cubes around to form a rectangle. Ask them, “Is this a rectangle? Is everything lined up?”
3. Your child should come up with 2 different rectangles: 1 row of 8, 2 rows of 4. These can be horizontal or vertical – it won’t matter. The important part is using 2 rows and 1 row as different arrangements for the same quantity. If they get stuck try asking, “How about if we have 2 rows? How about if we put them all in 1 row?”
4. Make sure that your child tries drawing the array when it is covered. This means they have to think far more about the 8 objects, such as thinking about the 2 lines of four squares. Be aware that many children need multiple attempts at this question. If your child is wrong, uncover the blocks/squares and look at them again with your child. Help your child think about what worked and what didn’t, then come up with a new plan if needed. Have them count the number in each row and look at how the squares/blocks are aligned. Re-cover the objects and try again.
5. If your child is still wrong after 8 attempts, reduce the number of blocks/squares to 4 or 6 and try again.
6. Encourage your child to find and draw an array with 12 or less objects from somewhere in the house. Scribe for them if you need to, but please don’t do the drawings as they help the child to develop a stronger understanding. Some examples include: eggs in an egg carton, windows in a frame, a muffin tin, Lego bricks, shelving or sets of drawers, ceiling panels or tiles.
7. 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. Try to encourage your child to count in 2s rather than 1s if the array is in 2 rows.



At-Home Investigation

Here is an array of muffins. They are lined up in rows. Use the squares to make some arrays and draw them.



Make 2 arrays from your 8 squares. Cover your arrays with a tea towel or piece of paper and draw what you can remember:
How are your arrays similar? How are they different?

Find 2 arrays in your house and draw them.

How many objects are in your arrays? How could you count them?

Lego arrays:

If you have Lego, find 2 different **shaped** blocks with 8 dots. Draw them here.

Tuesday: Connecting Lesson

Number game: *Hide and seek partitioning* This game is repeated from last week

You will need: an opaque bowl or cup and 6 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 your child cannot work out that there are 6 objects, reduce the number to 5 or 4 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 increasing the number of objects to 8, then 12, or using 2 bowls instead of 1 bowl and hiding the same amount of items beneath each bowl.

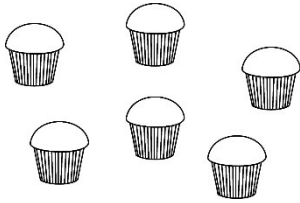
Worksheet task: 15-20 minutes

This lesson is following on from what your child learned yesterday about **arrays**. The purpose of the lesson is to discuss **aligning** objects into rows, then **counting them in groups** (e.g. for the muffins: 2, 4, 6). The last question (missing dots) is likely to be particularly tricky. It is a good extension for kids who are ready for it, but feel free to leave it out.

Connecting Arrays

Muffins

Here are some muffins. Draw them lined up to make an array.
How could you count the muffins? How many are there?

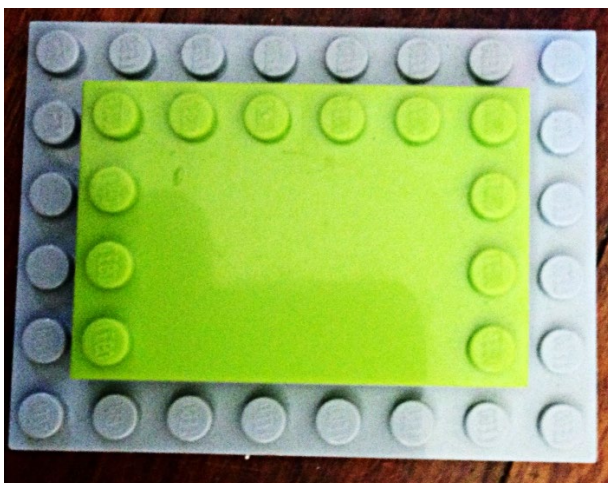


Egg carton

Draw the inside of an egg carton. How many holes are there? How could you count them?

Missing Lego dots

A Lego block has some dots missing. Draw in the missing dots and count them.



Wednesday: Number focus

This lesson allows your child to develop pictures in their minds for different amounts. This skill at Foundation is strongly linked with understanding of maths in Year 4.

Collecting amounts and drawing them in a structure This game is repeated from last week

You will need: Up to 10 small items (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. Ask your child to collect 8 spoons. Check to see if they collect the right amount then:
 - a. **If they collect 8:** ask them to leave the spoons with you, then collect “the extra spoons so you will have 10”. Do not ask them to collect 2 more. Check it with them. If needed, you can increase this to 12 but do not go further.
 - b. **If they do not collect 8:** ask “how many did I ask you to collect?” Remind them of the amount if needed. If they say, “eight”, then ask, “Can you check that you have eight please?” and watch them count the spoons. Hopefully this will help them realise that they have the wrong amount. If they self-correct, stick with eight. If their counting is not correct or they can’t collect 8 spoons, reduce the number of spoons to 6 or 4 and try again.
2. Once your child has successfully collected a given amount, cover the spoons with a tea towel or piece of paper, and ask your child to draw the right number of spoons. You might need to tell them to just draw a line for the handle and an oval for the top. We are not worried about how beautiful the spoons look – just the quantity that they draw.
 - a. Once they think they are done, use the spoons that they collected and place one spoon over each drawing of a spoon so that they “check” that they have the right amount. If incorrect, ask them to fix their drawing: “Do you need to draw some more spoons or cross some off?” Make sure to offer both ideas of drawing more and crossing off, rather than leading them too much.
3. Next, take the spoons and arrange them into 2 lines. Show the arrangement to your child and allow them to count the spoons and think about the arrangement. Put the towel or paper over the spoons so that your child can’t see them anymore and ask them to draw the arrangement. Please note: most children will need to try multiple times, checking each time, to get this correct. It is a very important skill because it helps them to “hold” a quantity in their head and build a mental image of that amount.



4. Extension if working with 12: ask your child to work out how to arrange the spoons into lines with the same amount in each and draw them. Can they use 3 lines? 4 lines? 6 lines? What numbers won’t work?

Important information:

Please try to help your child to think about what they have done when they are wrong, by asking them to check how many they have. Try to get them to adjust what they have made/drawn, rather than starting from scratch. E.g. “I have 7 instead of 6! I will have to cross one off to make it 6.” This emphasises the connections between numbers which makes adding and taking away much easier, as well as developing the skill of “balance” which is really important in algebra.

Number focus worksheet

Draw your spoons:

Draw your spoons in 2 lines:

Try drawing your spoons arranged to make a circle:

Thursday: Interleaved Practice Questions

Please read these questions to your child, rather than using them like a worksheet.

The questions can also be adapted for use as you play with your child, for example, you could share out the blocks you are using to make a tower, play 'hide the block' instead of toy cars.

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 practice to talk about together

Number:

1. Starting at 8, count in 2s to 20.
2. There were 8 toy cars. Jamie had 2. The rest were hidden under a bowl. How many were hidden?
3. What number comes before 7?
4. Write the number 8 in words.
5. Share 8 counters equally between 2 people. How many does each person get?

Measurement/Geometry:

6. Find a light object and a heavy object. What are they?
7. What time of the day will it be after lunch?
8. Draw a box.

Chance/Data:

9. Toss a coin 10 times. Record the number of heads and tails:

Friday: Connecting Lesson

Go on an array hunt! Take photos or draw 3 or 4 arrays that you can find in your house. Count the number of items in your arrays and write down the numbers. Explain how you counted them.

What shoes do you own? Try to find at least 5 pairs of shoes in your house. Draw them here in an array and count them.