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Week overview

Students at this age need to work out:

We are also hoping that students will learn:

You will need the following objects:

Monday: At-Home Investigation

Tuesday: Connecting lesson

Wednesday: Connecting and Application lesson

Thursday: Interleaved Practice Questions

Friday: Extension and Generalising 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 of one half. We want children to be able to work out both what is one half, and what is not one half. We will be linking to what we learned last week about capacity to think about “half a glass”. We will also look at halves of shapes (2D), half of a length of string, half of a window being covered, and half of a collection or group.

**For your information:** When students are learning about fractions in later years, they need to understand that:

- Fractions need to be “fair”. If the pieces are to be given the same name, then the **size** of each piece needs to be the same.
- Fraction names are related to the **size** of the pieces compared to the whole, not about how many pieces there are. If we cut a cake into 4 different sized pieces, they would not be quarters. Likewise, we could cut the cake into 1 half and 2 quarters, making 3 pieces altogether. They would not be called thirds.
- We can have different sized pieces in the same whole as long as we name them according to their size (e.g. one half, one quarter and two eighths cut into the same circle).
- The “whole” needs to be the same when comparing fractions. You can’t compare fractions if one is from a small pizza and one is from a family-sized pizza!
- Fraction names are related to ordinal numbers (e.g. position in a race: third, fourth, fifth...)
- Fractions and division are different expressions of the same concept:  $3 \div 4 = \frac{3}{4}$
- Fractions, decimals and percentages are all different ways of expressing the same amount. We can use the context “of a dollar” to help with conversions. For example, what is half of a dollar? 50c. The number of cents is the same as that fraction converted to a percent,  $\frac{1}{2} = 50\%$ . If we write the amount in dollars, we are converting it to a decimal,  $\frac{1}{2} = 0.50$  or 0.5
- In real life, we use fractions as numbers far more often than fractions of pizzas and cakes. For example, we express probability as a fraction, decimal or percentage (e.g. a 5% chance of rain), we use fractions in equations for measurement, we use fractions in budgeting. We will be using probability next week as a natural extension of what we learn about fractions this week.

### Students at this age need to work out:

- Halves need to be “fair”. If the pieces are to be given the same name, then the **size** of each piece needs to be the same. That includes half of a group of objects (e.g. half of 6 shells is 3 shells).
- We can have halves of different types of wholes. We can have “half full” glasses, halves of string or ribbon, halves of amounts (e.g. half of \$4 is \$2) and also halves of shapes (e.g. rectangles, circles).

### We are also hoping that students will learn:

- Ways to make 10 (card game that we will play this week and next week)
- How to partition amounts into parts that are not halves as well

### You will need the following objects:

- String or wool, glass with water, a window with a curtain/blind that can be drawn up/across
- Copies of the **Make 10** cards supplied for the game (you will use this next week too)

## Teacher Overview

Students will be considering halves and the idea of sharing fairly.

Ideally, we would use the following sequence of thinking to develop fractions from Foundation to Year 2/3. For all year levels, we need to make sure that we include the following models or representations: shapes (2D), objects (3D), collections or groups and lines. For older children we also consider fractions of numbers, and fractions as numbers themselves.

1. Understand and describe a “whole” and a “part”.
2. Make halves and consider what is a half and what is not a half. Understand that halves must be fair. This includes understanding half as sharing a collection fairly between 2 people (e.g. half of 8 lollies).
3. Understand that joining together halves makes the whole again. So, joining 2 halves of a circle forms the whole circle, or joining 2 halves of a class of children forms the whole class again.
4. Understand that we could cut a shape into more than two pieces, but still divide the pieces fairly between 2 people so that each person gets half.
5. Understand that the concept of the size of parts being fair applies to other fractions as well, not just halves. Fractions are named for the size of the part, not the number of parts.
6. Fraction names are related to ordinal numbers: third, fourth, fifth etc.
7. One fourth has a special name: one quarter. Quarters are fourths, not other fractions.
8. Understand that fractions and division are related to each other.
9. We can compare the size of fractions. The larger the number of pieces that a whole is divided into, the smaller the size of each piece. That means that eighths are smaller than thirds.

## 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 made sure that their halves were fair.

Check that the parents understand how the number games for the week work and make sure that you ask the student if they have played them yet. These tasks are about Partitioning. Please note: the cards this week are also available as a commercial product on our website. They are much more robust and appealing, and also come with instructions for multiple games to build fluency.

### 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 tasks so that students retain what they have learned and think regularly about adding and subtracting.

## Tracking student achievement

This week we are focusing on the Australian Curriculum Content Descriptor

**ACMNA016:** Recognise one half as one of two equal parts of a whole.

The Achievement Standard is **N6C:** Identify representations of one half. To receive an A or B the student should be able to identify halves of area, lines, capacities and groups.

## Monday: At-Home Investigation

Today we are learning about half, starting off with the concept of capacity that we were looking at last week.

### You will need:

- A glass that you can half fill with water
- String or wool and scissors to cut it in half
- A window that you can half-cover with a curtain, blind or towel

### 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 you would know which glass shows half. They should talk about the juice being “half way” up the side of the glass or having the “same amount” of air and juice in the glass. Ask which glass shows “more than half” and which shows “less than half”. If needed, point out which one is half and explain why. Focus on using the terms “fair”, “the same amount”, or “the same size”.
3. Repeat this process for “half the lollies”. Use blocks or counters to be the lollies if you need to.
4. For the questions on the second page, make sure that you try out their ideas first for half of the string and covering half of the window 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.
5. Help your child think about what worked and what didn’t, then come up with a new plan if needed.
6. Encourage your child to draw or write answers to the questions on the page. Scribe for them if you need to and feel free to take a photograph rather than drawing.
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.
8. At the end: consider writing a comment on the page to say what went well or what you are concerned about. This year we will be assessing whether or not your child understands halves.

At-Home Investigation

**Sharing and Half:**

Some of the pictures below show half and some don't show half.  
Tick the pictures that show half and **cross** the ones that don't show half.

**Half a glass of juice:**



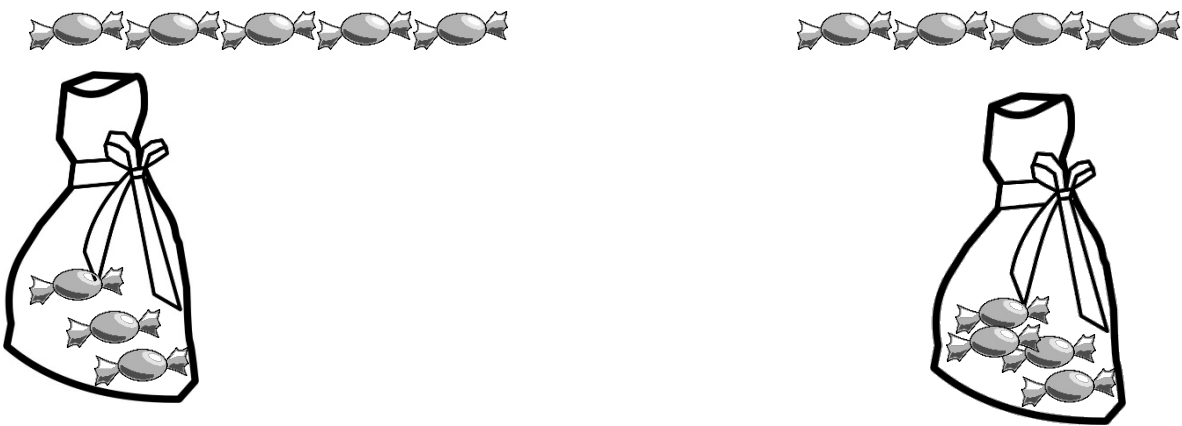
Explain your thinking:

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**Half of the lollies are in the bag:**



Explain your thinking:

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***Make or show half:***

**Half the string:**

Collect some string. Cut it in half. Tape both halves here. How did you make sure it was half?

My string:

**Half the window:**

Find a window in your home. Take a picture or draw it. Next, use a curtain, blind or towel to cover half the window. Take a picture or draw the window when half of it is covered.

My window:

## Teacher Overview

This is a ***Problem Solving and Reasoning*** 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 for sharing any amount fairly.

**If you are at school:** Focus on making halves using each of the models, rather than just using shapes. Make sure that you discuss what is half and what is not half.

**Please note:** Watch out for using the word “even” to mean “equally sized” when describing fractions. This tends to lead to students thinking that only fractions with even numbers for denominators can be evenly sized. Instead, try using any of the following terms or phrases: equal, fair, same-size, equivalent, same amount.

### Watch out for:

- Any two pieces as half – no need to be equally sized or shared fairly
- Only understanding half of a shape (today we are deliberately focusing on groups, lines and objects rather than squares and circles to build stronger conceptual understanding)

### Good questions to prompt thinking:

- How will we know how which one is half? How will we know which is not half?
- Is it fair?
- What would fair look like? That is half.

### Students requiring support:

- Use physical manipulatives
- Reduce the number of lollies
- Choose to ignore this activity in favour of more Partitioning or Quantity tasks

### Extension:

- Provide “half” and ask “what would the whole look like?”
- Halve other collections, including odd numbers
- Link with time: “half an hour”, being 5 and a half years old
- Link with measurement: “half a metre”, “half a litre”
- Link with chance: half the time the coin will show heads
- Link with money: half a dollar is 50c
- Link with a number line: half way between 0 and 10 is 5



## Tuesday: Connecting lesson

**Number focus game for 15 minutes: *making ten go-fish cards game***

You will need: the cards provided. You may want twice as many cards, so feel free to print them out two times. If needed, remove the cards that show more than 10 so that you can focus on adding smaller amounts.

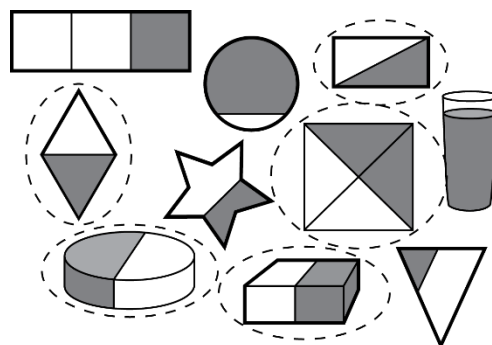
**This is a cooperative game, not a competitive game.** You need 2 or more players. You all “win” by using up all the cards. The aim is to make a set of cards that add or take away to give an answer of 10. A set can have as many cards as you want, as long as you can describe how to use the numbers to make 10. E.g. a set could have a 4, 8 and 2 because  $4 + 8 - 2$  makes 10

How to play:

1. Deal out 3 cards to each player. Show them face up so that everyone can see them.
2. One player starts by asking another player for a particular card so that they can make a set that adds or takes away to give ten. E.g. if they have a 4, they could ask for a 6.
3. When the second player is asked to give a card, they respond by asking, “How will you make 10?” The first player explains how they will use the card in combination with their own to make 10 (e.g. If I add your 2 to my 8 that makes 10).  
**Please note:** a set can have as many cards as you like (e.g.  $10 + 10 - 8 - 3 + 1 = 10$ ). This means that older players can make the game trickier by using all their cards in one go.
4. The set that makes 10 is added to a discard pile. Each player draws extra cards as needed so that they have 3 again.
5. If the first player cannot see how to make a set of 10, another player can help by saying, “you could use my 8 to make 10”. The first player can then try and work out how, and ask for the card indicated.
6. If there is no way to make 10 using the cards in play, the first player draws a card from the deck. They can either try again, or play passes to the second person. Each successive set of 10 is added to the discard pile – you don’t score how many sets you make.
7. The game ends when all the cards are used up. A “perfect game” uses up all the cards exactly.

**Worksheet task:**

The worksheet for today shows pictures that are half and that are not half. Here are the answers for your reference (circled ones are halves, non-circled ones are not halves). Please make sure to talk about half as sharing fairly or being equal. The picture that is likely to confuse children is the square with two quarters coloured. If you think about it, sharing 4 pieces between 2 people would mean that each person had 2 pieces. This question is meant to promote discussion, so please report back to your teacher about the discussion you had with your child.



Making ten card game

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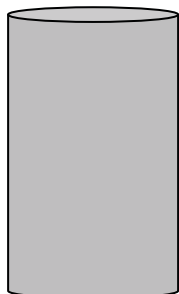
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## Problem 8: Simple fractions

Here is a glass of juice.



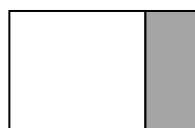
What would it look like if it was half a glass of juice?



This is a half.

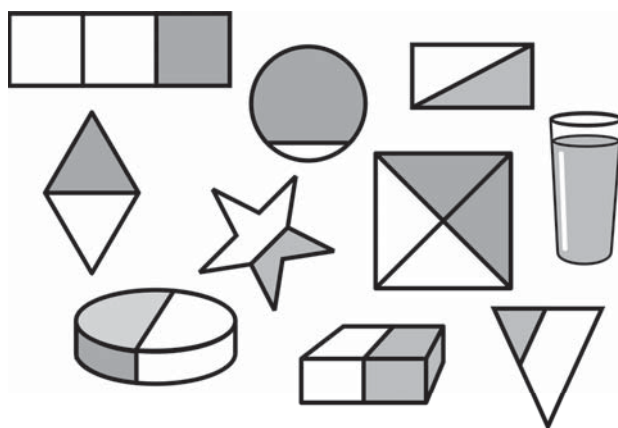


This is not a half.



Why is it not a half?

✓ Tick the pictures that show a half.



### Problem solving:

Teacher initials:

Date:

Student solved the problem with:

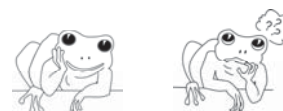
- ☐ Minimal help
- ☐ Some prompting
- ☐ Solved after explanation
- ☐ Did not work out a solution by themselves
- ☐ N/A – not a novel problem

How can you tell if the part shaded is a half?

Tell a friend why it is half.

Peer Assessment

Name:



## Teacher Overview

**Game:** The game this week is based on the key concept of **Partitioning**.

The purpose of this lesson is to make sets of numbers that add or subtract to give ten. Please note, you can purchase commercial versions of these Partitioning Cards from our website. The Partitioning card pack also includes instructions for 11 games that your students can play to build their partitioning skills. <https://www.backtofrontmaths.com.au/product-category/games>



**The worksheet task** is a **Reasoning** activity that asks students to identify what is half and also what is not half (prove true or false). Sometimes in junior primary we tend to forget to look at non-representations. Successfully completing this worksheet would be showing the C standard. To be an A or B, you will need to include other models (capacity, length, groups...).

You may also want to review concepts of arrays, shapes, length, time and capacity that students were working on in previous weeks to build retention.

### Wednesday: Connecting and Application lesson

This lesson allows your child to further practise representing halves. It introduces different models and helps children to think through what is half and what is not half.

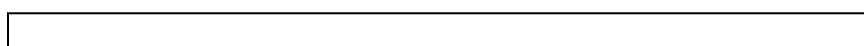
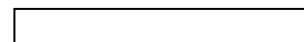
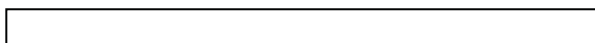
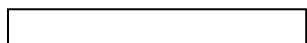
If you have extra time, please play the **Make Ten game** from yesterday again. We will also use this same game next week. Alternatively, you can just ask your child to use the cards to make sets of numbers that make ten.

## Application problems

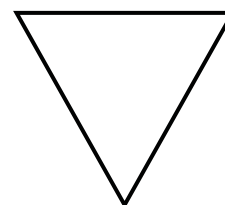
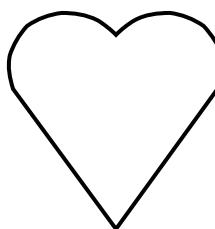
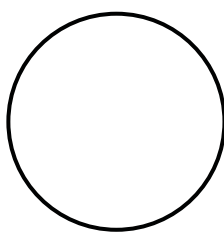
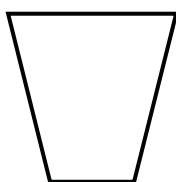
1. Here is a ribbon.



Colour the pictures that show what half of the ribbon would look like.



2.  Colour half of these shapes.



3. Aaron wanted to share his muesli bar with a friend so he cut it in half.

How many pieces will he need?



Draw a line to show how he could cut his muesli bar in half.



muesli bar



Can you think of another way to do it?

## Teacher Overview

This is an ***Application and Connection*** lesson. It gives students an opportunity to build their understanding of halves, and to incorporate drawing and naming as well. It should be a fairly easy lesson for families to complete after the more difficult focus on halves from Monday, but does introduce some new models. This sheet gives students another chance to demonstrate the C standard from the Achievement 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 practice

Number:

1. Draw 10 counters arranged as a triangle.
2. Two flowers were growing. Each had 7 petals. How many petals altogether? Draw them.
3. What number comes before 67?

Measurement/Geometry:

4. Draw a picture of a clock face.
5. What day was it before yesterday?
6. Use triangles and rectangles to draw a building.

Chance/Data:

7. Use tally marks to show how many days we have had so far this month, and how many days are yet to come.

## 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 B2FMaths@Home so that parents can find them if needed.

### **Support for struggling students:**

You might like to 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: Extension and Generalising Lesson

**Are different shaped halves the same size or not?**

*Your little brother is trying to decide how to cut his sandwiches. He decides that he wants to cut his sandwich diagonally so that the pieces are bigger and he can have more food. What do you think? Are the pieces bigger or not? Prove that your idea is right.*

Halves of the sandwich:



Use a rectangular piece of paper to represent the sandwiches – that way you can fold it and cut it to make each of the halves shown. **Are the halves the same size or different sizes?**

Draw pictures and write sentences to explain your thinking.

## Teacher Overview

This is a ***Problem Solving and Reasoning*** lesson. It is designed to extend student understanding further and promote generalising. In particular, this lesson asks students to work out half of a rectangle if cut diagonally. This will be a particularly tricky concept from many children so it should make a fun experiment for families at home and provoke good discussion. Feel free to suggest using an A4 piece of paper to cut.