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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 chance. We want children to be able to work out what will definitely happen, what might happen and what will definitely not happen.

For your information: When students are learning about chance or probability next year, they need to understand that chance is linked heavily with fractions. That means that all the ideas we explored last week with fractions still apply. Probability is always a fraction between impossible (no chance, 0%) and certain (100% chance).

We are hoping that students will:

- Decide on how likely some events are to occur: are they certain, possible or impossible? Are they likely or unlikely?
- Work out that very few things in life are certain or impossible. Mostly they are likely or unlikely.
- Predict what might occur in simple familiar events. Predict what will definitely not occur.
- Classify outcomes of events according to how likely they are to occur.
- Conduct simple experiments to gather data (e.g. flipping a coin, tossing dice, drawing out a coloured ball from a bag).
- List the possible outcomes of an experiment (e.g. the coin could only land on H or T).
- Explain why the results vary in experiments (e.g. why a coin doesn't just go H, T, H, T, H, T…)

Important terms to use:

- Impossible: there is no chance that this event will ever occur
- Certain: there is 100% chance that this event will occur (NB. Note the saying that the only things to be certain of in life are death and taxes. This points out that very few events are considered "certain". An example would be drawing out a ball that is red from a bag that only contains red balls.)
- Likely: over 50% chance of occurring, but not certain
- Unlikely: less than 50% chance of occurring, but not impossible
- Outcomes: the possible results or things that might occur, for example the results of an experiment
- Sample space: a list of all the possible outcomes of an experiment
- Variation: how the results can change each time you conduct a trial

Monday: At-Home Investigation

Today you will be discussing some contexts with your child and deciding whether events are certain, likely, could happen (50:50), unlikely or impossible. The emphasis of this lesson is on discussion and justification. Please make sure that your child answers at least half of the questions in written form, however you can just discuss the rest.

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 are familiar with the terminology.
2. Read the sheet to your child. Ask for their ideas. If your child gets stuck, focus on using the terms "possible" and "impossible". If the worksheet is too simple, try asking, "Which events have a similar likelihood? What order could you put them in?"
3. Help your child think about what worked and what didn't, then come up with a new plan if needed.
4. Encourage your child to write answers to at least half the questions on the page. Scribe for them if you need to. Discuss each possible event and how you know that they are possible or impossible.
5. 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.
6. The Manipulation Problem is an extension task. Feel free to skip it if you need to. It should provoke some good discussion though and would lead to some debate.
7. At the end: consider writing a comment on the page to say what went well or what you are concerned about.

Problem 26: Simple chance experiments

Find a partner. Examine the descriptions and events below and match them up if they fit. Sometimes multiple events might fit one description and sometimes no events might fit a description. Be prepared to prove you are right to another pair of students at the end.

Match up the events to the right description:

Event	Description
Tomorrow I will sleep in late	Certain to happen
Tomorrow I will be a frog	
Tomorrow I will go to school	Likely to happen
Tomorrow I will love pizza	
Tomorrow I will have a hair cut	Could happen
Tomorrow I will eat bread	
Tomorrow I will visit my friend	Unlikely to happen
Tomorrow I will be sick	
Tomorrow the sun will rise in the morning	Impossible

🗨 Sharing time: Which ones were hard to work out? Why were they hard?

_____

_____

_____

Understanding: *Choose a statement that you and your partner disagree about. Explain how you know that you are right:*

_____

_____

_____

Questions:

1. Which event do you think is the most likely to happen? Why?

_____

_____

2. Which event do you think is the least likely to happen? Why?

_____

_____

3. Brainstorm some other words that we use to describe how likely something is to happen. Write any that you can think of here and give an example of an event that would be this likely:

_____

_____

_____

Manipulation problem:
Two friends were trying to decide who should roll the die for their team. Charlie argued that she should roll because last time she rolled a six and therefore she is clearly a good roller. Liam argued that he should roll because Charlie couldn't roll another six when she had just rolled one. What do you think?

_____

_____

_____

_____

_____

_____

<table>
<tr><td>
Teacher initials:

Date:

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

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

Understanding / Reflect:
o Well reasoned manipulation problem, saw problems with both arguments
o Some help with manipulation problem, but then saw problems with both arguments
o Answered manipulation problem by relying on previous experience not on reasoning, or saw problems with only one argument
o Did not answer appropriately

o Student not observed
</td></tr>
</table>

Tuesday: Connecting lesson

Number focus task for 15 minutes: **This is repeated from last week**

You will need: the cards provided.

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 the same number, using the idea of "go fish".

How to play:
1. Deal out 3 cards to each player.
2. One player starts by asking another player for a particular card so that they can make a set. E.g. if they have a 23, they would ask for that same number. Please note: each number has 4 different representations (2 blocks pictures, the number in digits and the number in words).
3. When the second player is asked to give a card, they respond by handing over their card with that amount if they have it, or saying, "Go fish" if they don't. All sets are added to a discard pile. If the player does not make a set then they draw another card.
4. Each successive set of 10 is added to the discard pile – you don't score how many sets you make, you just try to use up all the cards. The game ends when all the cards are used up. A "perfect game" uses up all the cards exactly.
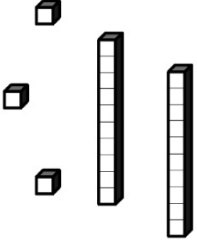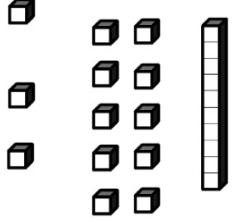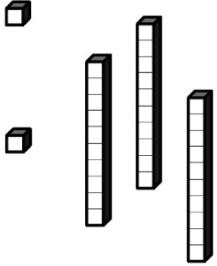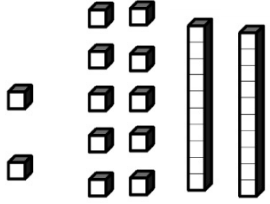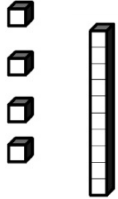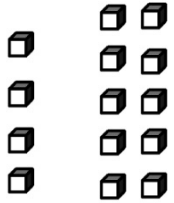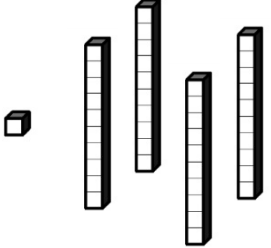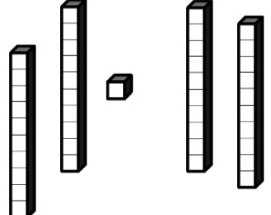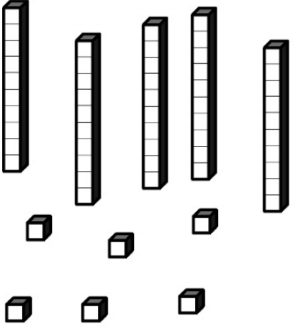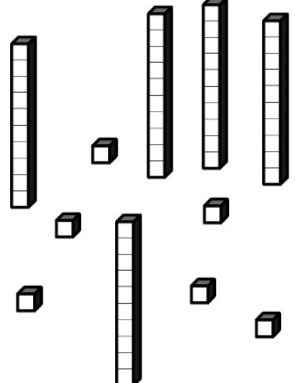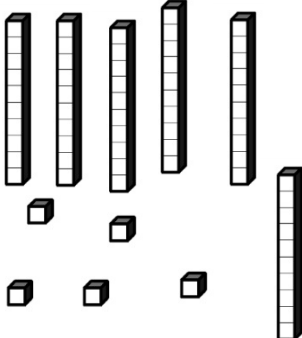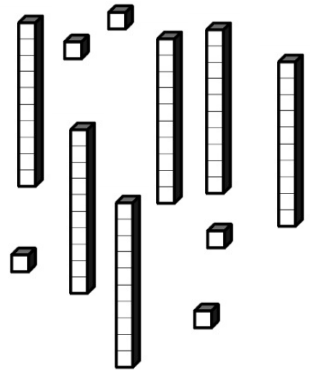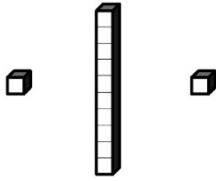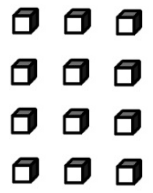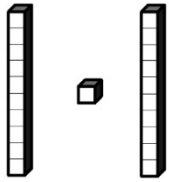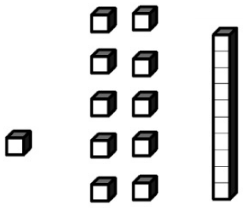
Variations:
Play concentration to match the amounts, or try snap.
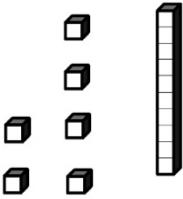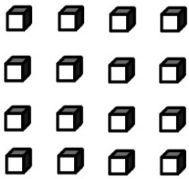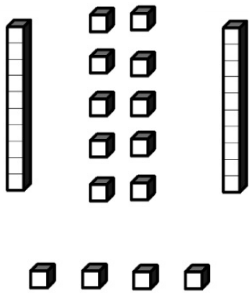
Worksheet task:
The worksheet for today reviews the language and terminology of chance. Please make sure that you discuss what your child has done with them so that they understand each term. That will be important later this week.

Place Value card game

	23	Twenty-three	
	32	Thirty-two	
	14	Fourteen	

	41	Forty-one	
	56	Fifty-six	
	65	Sixty-five	
	12	Twelve	

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	21	Twenty-one	
	15	Fifteen	
	16	Sixteen	
	34	Thirty-four	

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Use the following terminology to describe the possibility of achieving the outcomes listed below. An example has been completed for you.

Terminology: certain, most likely, more likely, equally likely, less likely, least likely, multiple outcomes.

Example:
When I toss a coin, the likelihood of getting heads or tails is: <u>equally likely</u>.

Describe the likelihood of the following outcomes occurring:
1. The sun rising tomorrow.

2. Throwing a 6 on a dice compared to throwing a 3 on a dice.

3. A bag contains 5 balls. There are 4 red and 1 blue.
    • Describe the likelihood of getting a red ball over a blue ball:

    • Describe the likelihood of getting a blue ball over a red ball:

4. Choose three people from your class. List them below. Describe the likelihood of each one winning in a race:
    •

    •

    •

5. For the same three people from above, describe the likelihood of each one winning a mental maths competition against each other:
    •

    •

    •

6. Who in your class would be 'most likely' to win an art prize?

7. Who in your class would be 'equally likely' to have the same food for lunch?

8. Who would be 'least likely' to be found in the school computer room?
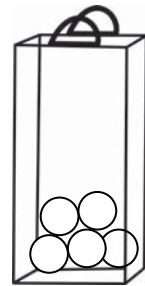
What patterns have I found?

BACKWARDS QUESTION:
Make up a question for which the answer would be, 'more likely':

In this activity you will learn about the Sample Space in an experiment. Look at the descriptions below to work out what the sample space is. Use this to describe the sample space for the experiments listed below.

Example:
For tossing dice, the possible outcomes are 1, 2, 3, 4, 5 and 6.
The sample space is 1, 2, 3, 4, 5, 6.

Describe what you think sample space means:

For the experiments below, list the sample space:

1. Tossing a coin

2. Choosing a ball from a bag that contains red and blue balls

3. Choosing a number from 1 – 10

4. Spinning the spinner shown below:
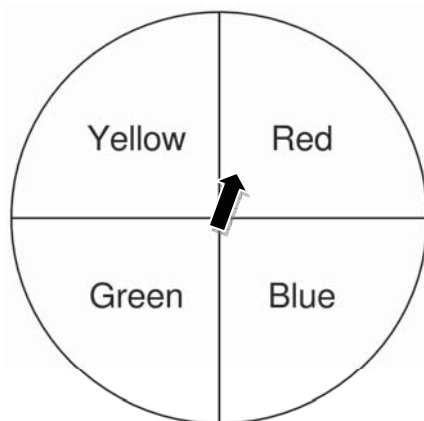
What does sample space mean?

BACKWARDS QUESTION:
If the sample space for a spinner was yellow, yellow, red, blue, what do you think the spinner might look like? Draw it:

Wednesday: Connecting lesson

This lesson allows your child to conduct some simple chance experiments and collect data.

You will need:
- A coin to toss
- Dice

For each experiment, ask your child to first make a prediction about what they think will happen. Then carry out the experiment and record what actually happens. Once children return to school they will combine the data for their whole class and look at the variation in results.

If you do not have real dice, you can find an online version here: https://www.random.org/dice/

Wednesday: Connecting lesson

12. Conduct experiments to collect data

☐ You are going to conduct some experiments to collect data. You will list the sample space in the left column of the tables below. You will repeat the experiment 20 times, and record the number of times each outcome occurs using tally marks.

Experiment 1: Tossing a coin

Sample Space:	Number of outcomes out of 20 trials:

What did you find?

Experiment 2: Rolling a die

Sample Space:	Number of outcomes out of 20 trials:

What did you find?

BACKWARDS QUESTION:
If an experiment gave the following results for 40 spins of a spinner, draw what you think the spinner might look like: Red: ЖЖ ЖЖ ЖЖ ЖЖ ЖЖ ЖЖ   Blue: ЖЖ ЖЖ   Why do you think having more spins makes a difference?

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.
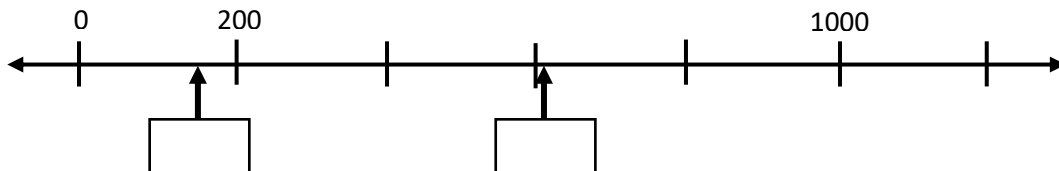
Interleaved practise

Year 3, week 8

Number:

1. Make up a number pattern that starts with the number 205. Write it on the lines and describe the pattern.
205, _____, _____, _____, _____, _____

2. These biscuits are packed in boxes in layers that look like this. How many biscuits would there be if there were 2 layers in a box? Show how you worked it out.

3. What numbers would go where the arrows are pointing?

4. Use these rectangles to show which is bigger **one quarter** or **one fifth.**
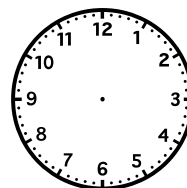
5. I received $2.45 change from $5.00 when I bought some lollies. How much did I pay for the lollies?

Measurement/Geometry:

6. I have measured out 1 litre of juice into this jug. How many 200mL glasses of juice can I pour with it?

7. Draw the hands on the clock to show 25 minutes to 4.

   What would it look like on this digital clock?
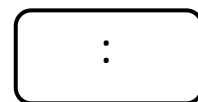
8. On the back of this sheet, draw 3 objects you find in your home or classroom that are symmetrical.

Chance/Data:

9. Draw the counters that are in the bag using this information:
   - There are 14 counters in the bag. They are blue, yellow and green.
   - If I shut my eyes and take out a counter, I have the same chance of drawing a blue or a yellow counter

Friday: Consolidating lesson

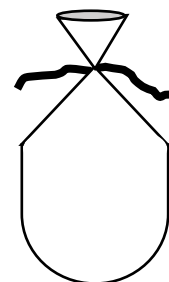In this lesson your child will review what they have learned about likelihood. They will consider common events and outcomes of experiments and classify them using the language of chance. While this lesson should be relatively easy, please spend time discussing how and why your child used each term for each event. The reason for their answers is more important than the actual answers.

12. Difference between likely and certain

Find a partner. Decide if the following statements are **certain** (absolutely will happen, nothing can stop this happening) and which are **very likely** (will almost certainly happen, but something could happen to stop it).

Situation	Circle the description that fits:
I will have tea tonight	Very likely / Certain
My favourite food today will be my favourite food tomorrow	Very likely / Certain
I will go to school on Tuesday	Very likely / Certain
The sun will rise tomorrow	Very likely / Certain
My teacher today will still be my teacher tomorrow	Very likely / Certain
It will be hot in Summer	Very likely / Certain
I will get a present or card on my birthday	Very likely / Certain
I will see you tomorrow	Very likely / Certain
It will rain sometime in the next year	Very likely / Certain

How did you decide if something was very likely or if it was certain?

Which ones did you argue over? Why?

BACKWARDS QUESTION:
Which one is the most certain? Explain your answer:

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13. Difference between unlikely and impossible

📋 Find a partner. Decide if the following statements are **impossible** (absolutely will not happen, nothing can make this happen) and which are **very unlikely** (will almost certainly not happen, but something could happen to change this).

Situation   Circle the description that fits:

I will not have tea tonight   Very unlikely / Impossible

My favourite food today will not be my   Very unlikely / Impossible
favourite food tomorrow

I will not go to school on Tuesday   Very unlikely / Impossible

The sun will not rise tomorrow   Very unlikely / Impossible

My teacher today will not still be my   Very unlikely / Impossible
teacher tomorrow

It will be not hot in Summer   Very unlikely / Impossible

I will not get a present or card on my   Very unlikely / Impossible
birthday

I will not see you tomorrow   Very unlikely / Impossible

It will not rain in the next year   Very unlikely / Impossible

---

How did you decide if something was very unlikely or if it was impossible?

Which ones did you argue over?   Why?

BACKWARDS QUESTION:
Which one is the least certain?   Explain your answer:

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