Can You Hack A Bingo Card?

NEW June 2026

Year level: 6

Approximate number of lessons: 2

Learning goals

This activity explores the following key ideas:

- engage in chance-based investigations, including those with not equally likely outcomes, by:
    - posing an investigative question
    - anticipating and then identifying possible outcomes for the investigative question
    - generating all possible ways to get each outcome (a theoretical approach), or undertaking a probability experiment and recording the occurrences of each outcome
    - creating data visualisations for possible outcomes
    - describing what these visualisations show
    - finding probabilities as fractions
    - answering the investigative question
    - reflecting on anticipated outcomes

- compare findings from the probability experiment and associated theoretical probabilities, if the theoretical model exists.

- identify, explain, and check others' statements about chance-based investigations, referring to evidence.

Resources

- **Empty Bingo cards**. You will need enough for each ākonga to have three games of bingo at least.
- **Empty addition squares** (or ākonga make their own).
- **Table for possible outcomes** (or ākonga make their own).
- **Summary table for possible outcomes** (or ākonga make their own).
- Two 10-sided dice
- Modelling book and felts to record ākonga thinking

https://pixabay.com/photos/dice-toy-dice-ten-page-color-luck-2168705/

Activity - Lesson 1

Introduction

- Discuss ākonga experiences of the game of bingo.
    - Where have they seen it played?
    - Who was playing Bingo?
    - What do they know about the different rules of Bingo?

- Introduce the game of Addition Bingo.
    - Explain that, in this game, only a full sheet wins.
    - Students decide on the numbers to put on the Bingo card and they can have repeated numbers on the Bingo card.
    - Explain that the numbers will be the **sum** of two numbers from 0 + 0 to 9 + 9.
    - A caller rolls two 10-sided dice and calls an addition fact using the two numbers rolled. For example they may roll a 9 and a 7 and call "9 + 7", students then work out the sum and cross it off on their sheet if they have the sum, in this case 16.
    - Players with that particular sum on their Bingo card can colour in the square or tick or cross it off on their Bingo card. For any given roll of the dice and subsequent sum, they can only colour, tick or cross off the sum once.
    - This is repeated until a player has all numbers on their Bingo card coloured, ticked or crossed. At this stage they call "BINGO!" and they have won the game.

- Play a game of Addition Bingo with premade **Bingo card empty templates**. Akonga can choose which numbers they place inside each square. Try not to provide guidance on choosing numbers. This is an important step for ākonga who have not played before, or who have played a similar game with different rules. It is important to ākonga understanding that this basic step be carried out.

- Vocabulary is important. Numbers rolled and called stem from dice rolls. Numbers on the bingo cards are the sum of numbers rolled and called.

? PROBLEM:

- Present a wondering, "What sums should I put on my Bingo card to give myself the best chance of winning?"
    - Record ākonga initial ideas and their reasoning in a modelling book. They may comment on lucky numbers, or some sums being more likely than others.
    - Identify which sums are possible, are some sums impossible?

- Pose the investigative question, "Are some sums more likely to be rolled than others?"

PLAN:

- Make a plan to investigate which sums are more likely to occur.

- Start with an open ākonga discussion.
- What is the smallest number that can be rolled using one 10-sided die (dice)?
- What is the largest number that can be rolled using one 10-sided die (dice)?
- What is the smallest sum that can be found from the roll of two 10-sided dice?
- What is the largest sum that can be found from the roll of two 10-sided dice?
- Can ākonga suggest a way to sensibly and methodically check <u>which</u> sums can be found from the roll of two 10-sided dice?
- Can ākonga suggest a way to sensibly and methodically check which sums are more likely to be found from the roll of two 10-sided dice

- Guide ākonga to plan to use an **addition square** to generate all possible outcomes, that is all possible sums from the roll of two 10-sided dice.

+	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

- Ask ākonga what they notice about the possible outcomes, the possible sums.
  - Are some outcomes (sums) more likely than others?
  - How do they know?
- Guide ākonga to create a template for collecting data about the sums most likely to be found from the roll of two 10-sided dice.

DATA:

- Ākonga fill in the addition table to find every possible outcome.

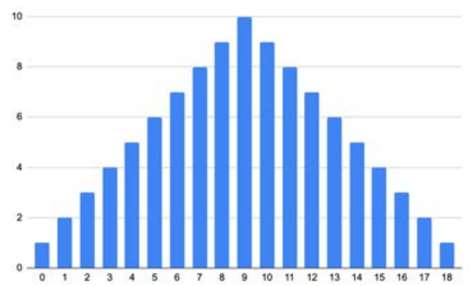
+	0	1	2	3	4	5	6	7	8	9
0	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
2	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
3	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
4	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
5	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
6	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
7	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
8	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*
9	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*

- Ākonga then tally how many times each outcome appears across all the addition facts - see **Table for possible outcomes master**.

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Tally																			
Frequency																			

ANALYSIS:

- It may be helpful for ākonga if they graph these frequencies. Their graph will look similar to below.



- Support ākonga to calculate the probability of each outcome (sum) occurring. There are 100 possible outcomes which makes this task quite straightforward. Record these as fractions, decimals and percentages in the chart as below.

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Probability of occurrence	$\frac{1}{100}$	$\frac{2}{100}$	$\frac{3}{100}$	$\frac{4}{100}$	$\frac{5}{100}$					$\frac{10}{100}$									
Probability of occurrence (decimal)	0.01	0.02	0.03	0.04	0.05					0.1									
Probability of occurrence (percentage)	1%	2%	3%							10%									

- Support ākonga to compare the frequencies of possible outcomes
  - Identify which numbers are impossible (anything over 18),
  - Identify which are rare (0, 18).
  - Identify outcomes which come up most often (9, with 10 different ways to make it).

- Compare data from the addition table, tally charts, the graph and the fractions/decimals/percentage chart.
  - What do ākonga notice?
  - What information is most easily seen in each of the different ways the data has been visualised?

- Reflect back on the ideas ākonga shared in the problem phase of this lesson, about which sums to choose for a successful Bingo card.
  - Would they choose the same sums?
  - Which sums would they choose now?
  - Why would they choose these sums?
  - What evidence do they have to support their answers?

CONCLUSION:

- Support ākonga to use the frequency data to build the smartest possible Bingo card.
- Test these new Bingo cards in a game.
- Discuss with ākonga:
  - Was this Bingo card more successful compared to your initial Bingo card?
  - Can you hack a Bingo card? Use the evidence generated by the tally chart, the graph and the frequency table to justify your answer. Ākonga answers could provide an exit ticket for formative assessment.
  - Does probability alone determine the winner?

Extension Activity

- Support ākonga to explore the idea of making a set of cards where everyone has an equal chance of winning.

- Does a similar pattern exist for Multiplication Bingo using 10-sided dice?

Notes for teachers

- You can use a 6 sided dice for this activity however it limits the breadth of number choice.
- If you do not have 10-sided dice you could use two digital spinners with ten options each. Depending on the tool you use, you might have to change from 0 + 0 to 9 + 9 sums to 1 + 1 to 10 + 10 sums.

https://new.censusatschool.org.nz/resource/data-detective-poster/

Can you hack a Bingo card student materials

Resource list with preparation

Resource	Preparation required	Approx numbers
Blank Bingo cards	Print onto paper and cut up.	Enough for 3-4 cards each.
Empty addition squares	Print onto paper and cut up.	Enough for one each.
Table for possible outcomes	Print onto paper and cut up.	Enough for one each.
Summary table for possible outcomes	Print onto paper and cut up.	Enough for one each.

Blank Bingo cards

BINGO			

BINGO			

BINGO			

BINGO			

BINGO			

BINGO			

Empty addition squares

+	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

+	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

Table for possible outcomes

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Tally																			
Frequency																			

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Tally																			
Frequency																			

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Tally																			
Frequency																			

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Tally																			
Frequency																			

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Tally																			
Frequency																			

Summary table for possible outcomes

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Probability of occurrence	$\frac{1}{100}$	$\frac{2}{100}$	$\frac{3}{100}$	$\frac{4}{100}$	$\frac{5}{100}$					$\frac{10}{100}$									
Probability of occurrence (decimal)	0.01	0.02	0.03	0.04	0.05					0.1									
Probability of occurrence (percentage)	1%	2%	3%							10%									

Outcome	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Probability of occurrence	$\frac{1}{100}$	$\frac{2}{100}$	$\frac{3}{100}$	$\frac{4}{100}$	$\frac{5}{100}$					$\frac{10}{100}$									
Probability of occurrence (decimal)	0.01	0.02	0.03	0.04	0.05					0.1									
Probability of occurrence (percentage)	1%	2%	3%							10%									