

Y6 The Great Sausage Flip: A Probability BBQ

NEW October 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

- Modelling book and felts to record ākonga thinking
- Coins, one or four for each pair of ākonga depending on experimental design (see plan phase)
- [My dream sausage sheet](#) - see Material Masters
- [Data Recording Chart](#) - see Material Masters

Activity - Lesson 1

Introduction

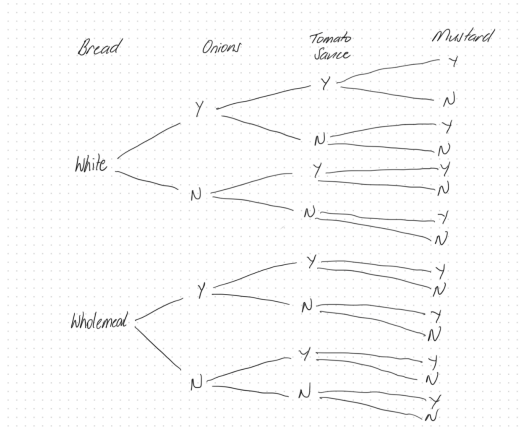
- Discuss ākonga experiences of sausage sizzles or family BBQs.
 - Where have they seen sausages for sale?
 - What options were available? For example, tomato sauce, mustard, onions.
 - What do they know about planning for a sausage sizzle?
 - Have they ever noticed that while some people automatically know what they would like on their sausage, others struggle to make these choices? Who are these people and why do ākonga think that some people struggle to choose?

? PROBLEM:

- This lesson is built around ākonga choosing bread type (white/wholemeal), onions (yes/no), tomato sauce (yes/no) and mustard (yes, no). Given these parameters, ask ākonga to design their dream sausage. You may like to use the [My dream sausage sheet](#) in the material masters.
- Imagine and discuss what would happen if every choice in choosing options at a sausage sizzle was decided by the flip of a coin.
 - How would this impact the organisers of the sausage sizzle?
 - How would this impact the customers?
- Pose the investigative question, "If the type of bread and every topping on a sausage is decided by a coin flip, what's the chance of getting YOUR dream sausage?"
 - Ask ākonga to record their chances of getting their Dream Sausage on their [My dream sausage sheet](#), see material masters.
 - Discuss ākonga anticipated outcomes and reasoning.
 - Have some ākonga expressed their thinking using probability vocabulary such as likely, probable, may, won't or have ākonga used fractions/decimals/percentages? You may like to encourage ākonga to use an example of each.
 - Compare and contrast ākonga reasons.

PLAN:

- Acknowledge that although there are individual preferences involved that ākonga can all work together to answer this question by investigating all outcomes.
- Support ākonga to create a probability tree to systematically record all possible outcomes.



- It may be important to ākonga to discuss that when putting a sausage in bread together some choices come first. For this investigation the order of choices does not matter. Ākonga may wish to draw up another probability tree where choosing sauces comes before onions etc, if so give them time to investigate this idea and realise that the number of possible outcomes will always be the same.
- Ask ākonga what they notice about the possible outcomes.
 - How many possible outcomes are there?
 - Do any outcomes repeat?
 - How do ākonga know this?
- Ask ākonga to highlight the probability tree pathway that leads to the outcome of their own dream sausage.
 - What is the probability of ākonga getting their own dream sausage?
 - Support ākonga to express this as a fraction, a decimal and a percentage
 $\frac{1}{16}$, 0.0625, 6.25%
 - Is it the same for everyone, or do some people have a greater likelihood of getting their dream sausage? Why?
- Now that the possible outcomes have been identified it is time to plan an experimental investigation. Support ākonga to:
 - Decide how to simulate a choice: flip four coins (or one coin four times) per sausage = one "customer"
 - Agree coin rule: heads = wholemeal/yes, tails = white/no (or whatever is clearest)
 - Decide sample size: e.g., 20 sausages made per pupil/pair
 - Decide what to record: tally sheet with four columns (bread/onions/sauce/mustard) per trial, plus a tick if it matches their dream sausage - see [material masters](#)
- Support ākonga to discuss their anticipated outcomes.
 - How often do they predict their dream sausage will occur if decided by a coin?

DATA:

- Ākonga use coin flips to generate 20 trials/customers, recording their data on the [data recording chart](#).

The Great Sausage Flip: A Probability BBQ Data Recording Chart

Customer (Trial)	Bread Choice White/Wholemeal	Onions Y/N	Tomato Sauce Y/N	Mustard Y/N	Dream Choice Y/N

- Ākonga tally the number of times their dream sausage occurred.
 - It will be easier if ākonga express this a fraction with a denominator of 20.
 - Compare and contrast this fraction with other ākonga.
 - Ask, did anyone not achieve their dream sausage at all? Why is this? What fraction expresses this probability?
 - Express this individual experimental probability fraction as a decimal and a percentage.
- Combine results across the classroom and calculate a combined experimental probability of a dream sausage occurring.
 - Make sure that ākonga express this fraction as a decimal and a percentage.

ANALYSIS:

- Support ākonga to re-visit the tree diagram. Ask:
 - What was the theoretical probability of one specific sausage? ($= \frac{1}{16}$, 0.0625, 6.25%)
 - How do we know this?
- Support ākonga to compare and contrast their own individual experimental probability of choosing their "dream sausage" vs the theoretical probability.
 - You may like to make a data display or graph the individual experimental probability here, it may make it easier for the class to discuss.
- Support ākonga to compare and contrast the whole class combined experimental probability of choosing a "dream sausage" vs the theoretical probability.
 - Ask, does the combined data sit closer to the theoretical probability of $\frac{1}{16}$?
 - Why has this happened?
 - If we carried out another 20 trials each what do you predict would happen to the combined experimental probability? *If you have the time you may like to do this!*

💡 CONCLUSION:

- Revisit the investigative question: If the type of bread and every topping on a sausage is decided by a coin flip, what's the chance of getting YOUR dream sausage?
 - Did getting your dream sausage happen about as often as you expected?
- Ask ākongā to revisit their original anticipated outcome written on their [My dream sausage sheet](#) - see Material Masters. Ask:
 - Do you agree with your statement or do you think something different? Why?
 - What evidence do you have to support your thinking?
- Ask ākongā what they think the chance of getting their dream sausage is now?
 - Encourage ākongā to use the tree diagram, and the results from the tally sheets, and the whole class combined data as evidence within their reasoning.
 - Ākongā record their final statements on their Dream Sausage order sheet, this then becomes their exit ticket and a means of formative assessment - [see material masters](#).

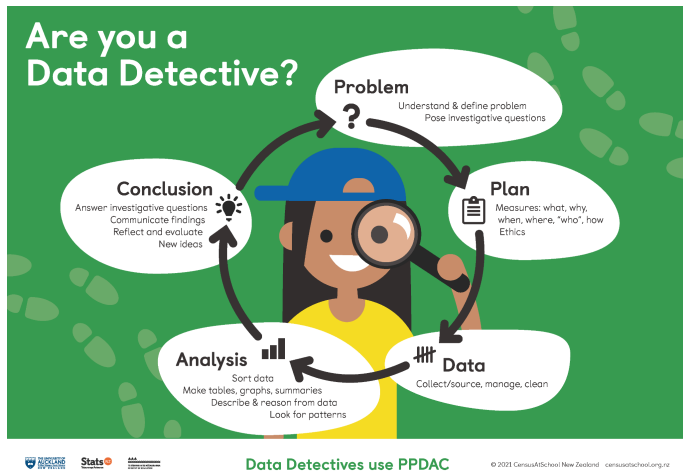
Extension Activity

- Ākongā may be interested in investigating the statistics around their own dream sausages. Ākongā may wish to carry out another investigation using a similar method whereby no coins are used but instead ākongā interview each other asking "what is your dream sausage order?" Differences between investigations would then make room for discussions around individual preferences, customer bias and trends. You could then ask:
 - Which dataset would be most useful in planning a sausage sizzle for your class?
 - Would this dataset also be helpful in planning a sausage sizzle for another class of similar aged ākongā in your school? How about a class of 5-year old ākongā?
 - Would it be helpful in planning for a fundraising sausage sizzle outside the supermarket on Saturday?

Notes for teachers

- **Key teaching point:** individual results vary a lot with small samples (someone might get their dream sausage 3 times, someone 0 times), but the bigger the sample, the closer results tend to get to the theoretical $\frac{1}{16}$.
- Link ākongā thinking back to the "fair test" idea: because the outcome was generated by a fair coin (not a real choice), every pupil's trial was equally random, so differences in results are due to chance/sample variation, not actual customer bias.
- When creating the probability tree to systematically record all possible outcomes during the planning phase for this investigation ākongā may question the order of choices. You may wish to spend a separate lesson drawing up a number of probability trees using the same choices but in

different orders. This will lead ākonga to compare and contrast the different trees and possible outcomes, coming to the conclusion that the number of possible outcomes will always be the same.



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

The Great Sausage Flip student materials

Resource list with preparation

Resource	Preparation required	Approx numbers
My dream sausage sheet	Print out	One for each ākonga
Data Recording Chart	Print out	One for each buddy pair or ākonga

My Dream Sausage Sheet

_____’s Dream Sausage Order Sheet		
Bread	Wholemeal	White
Onions	Yes	No
Tomato Sauce	Yes	No
Mustard	Yes	No

1. I think that the chance of getting my dream sausage is _____ because

2. Now that you have carried out the investigation you may think differently or not! Either way, answer the question again, this time using evidence to support your thinking.

Now I think that the chance of getting my dream sausage is _____because

Data Recording Chart

The Great Sausage Flip: A Probability BBQ Data Recording Chart

[illegible]