

Sky Spies - A Longitudinal Lesson

NEW October 2026

Year level: 6

Approximate number of lessons: 1 *(to start with, then ongoing data collection and analysis as time allows throughout the year.)*

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
 - 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 a probability experiment with forecasted probabilities.
- identify, explain, and check others' statements about chance-based investigations, referring to evidence.

Resources

- Modelling book and felts to record ākonga thinking
- [You tube clip ready to share](#)
- Weather apps loaded onto ākonga accessed devices (Suggested [Accuweather](#), [Weatherwatch.co.nz](#), [Google Weather](#)). Consider having some NZ based and some international based companies to compare here. Accuweather for example is based in America, Weatherwatch is based in NZ.
- [Sky Spies Data Recording sheets](#) - see Material Masters

Activity - Lesson 1

Introduction

- Too often we seem to be caught by rain, and surprised by weather forecasts. Ask ākonga to discuss times when:
 - They needed to know whether it may rain.
 - They have checked the weather and it has helped them make a decision.
 - They felt that the forecast was wrong.
- What methods do ākonga use to check the weather?
 - You may like to make a list of apps and other methods here for revisiting later.

? PROBLEM:

- Apps and weather forecasts can give us a “probability of precipitation” measure (PoP), or a “chance of rain” measure. Ask ākonga:
 - What is precipitation? (Measures here involve rain, snow, sleet and hail)
 - Are these measures the same or different?
 - What does a percentage chance of rain or precipitation actually mean?
 - Watch the [linked](#) YouTube video.
 - Re-state what a probability of precipitation measure, or a chance of rain measure means. Record this in the modelling book.
 - Do you think that forecasters are usually right? Always right? Or, right more often when the chances of rain/precipitation are higher?
- How could we find out instead of just guessing?
- Support ākonga to pose the investigative question: “When the forecaster says there is a chance of rain, how often does it actually happen, and does the forecaster's percentage match what really happens?”

PLAN:

- Support ākonga to decide how the investigation will run. This is also where you set up the ongoing data collection, the same plan will be used all year. Ākonga will need to decide:
 - What will be recorded each day
 - The forecast's stated chance of rain (from a weather app or a few apps), recorded each morning.
 - Whether the forecaster predicted rain or no rain (using a simple rule: 50%+ = "predicted rain").

What actually happened that day (rain / no rain), agreed as a class at the end of the day about a specific location. For example, on the netball court.

- How long & how often will data be recorded
 - Collect data for two school weeks (10 school days) per round.
 - Run this round 3–4 times across the year (e.g. once per term), so the class can compare terms and seasons. Which weeks will you do this?
 - Plan where you will display your data. Keep all previous rounds' data visible. Don't hide old charts away, add new ones alongside the old ones as discussion points and referencing as evidence.
- Who will be responsible for each job:
 - Forecast Checker - looks up and records the morning forecast at a given time each day. You may like to have one checker for each app you are using and a set alarm to remind ākonga.
 - Sky Reporter - leads ākonga discussion at the end of the day and updates what actually happened at the end of the day.
 - Data Keeper - Updates and oversees the class Tally Chart

DATA:

- Ākonga use the following **grid** to collect data.

Daily Data Log (Round __) For _____

Day	Forecast %	Predicted? (Rain/No Rain)	Actually Happened?	Match? (✓ or X)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Here is an example of what it might look like. If you are investigating more than one app you will need multiple sheets.

Daily Data Log (Round 1) For Metservice

Day	Forecast %	Predicted? (Rain/No Rain)	Actually Happened?	Match? (✓ or X)
1	20%	No rain	No	✓
2	70%	Rain	YES!!!	✓
3	50%	Rain	Yes :-	✓
4	10%	No rain	Yes	X
5	15%	No rain	No	✓
6	10%	No rain	No	✓
7	≤ 95%	Rain	Yes	✓
8	80%	Rain	Yes	✓
9	10%	No Rain	No	✓
10	10%	No Rain	No	✓

- Remember to display these charts in an easy to see accessible location in the classroom.

ANALYSIS:

- Once one round or ten days of data has been collected ask ākonga to:
 - Tally the matches for each app
 - Calculate the experimental probability for each app, experimental probability of a correct forecast = (matching days) ÷ (total days). Express this as a fraction, a decimal and a percentage.
 - Tally the matches for days where the forecasted probability was >70%.
 - Calculate the experimental probability for these days, = (matching days >70%) ÷ (total days >70%). Express this as a fraction, a decimal and a percentage.
- Support ākonga to discuss:
 - Did the forecaster predictions match what really happened?
 - Were the predictions more accurate when rain was more likely?
 - Was there a difference between apps? If so, what was the difference and why does it exist?
- Support ākonga to write a statement answering these questions comparing the forecasted and experimental probabilities, using data as evidence within their reasoning.
- Make predictions about the next round of data collection. What do you think will happen and why? Record your thinking in the modelling book.
- Term by term questions:
 - Term 1 - Do we think that the next round will have similar results?
 - Term 2 - Did the percentages change? Why do you think they changed/didn't change?
 - Term 3 - Has accuracy changed with the season? Are overall percentages across all rounds more accurate than each round on its own?

- Term 4 - Compared to Round One, what do you trust more? An overall percentage of matches or data from a single round? What do you think that?

CONCLUSION:

- Bring the class back to the original question and discuss as a group.
 - Based on our data, were the forecasters generally accurate?
 - How did apps differ? Why did they differ?
 - Did higher forecast percentages line up with more actual rain?
 - What might explain any days where the forecast was "wrong"?
 - Do we trust 10 days of data enough to be sure? Why or why not?
- Ākonga could answer the following question as a summative measure of their understanding throughout this investigation, "What app would you recommend for predicting the weather, and what is your evidence for your recommendation?"

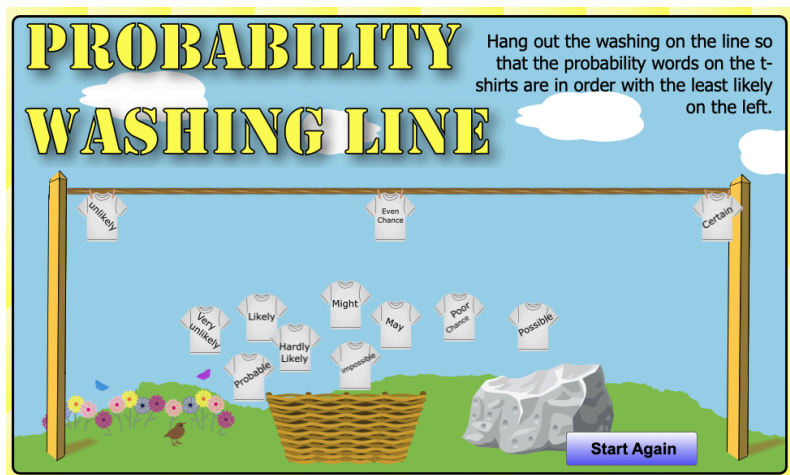
Extension Activity

- There is an opportunity to graph this data. You might like to create a dot plot whereby each round is a dot, you could use colours for different apps. The x-axis being the percentage of "matches", and the y-axis being the percentage of "non-matches".

Notes for teachers

- The purpose of this longitudinal lesson is for ākonga to engage in a chance-based investigation over time. This provides multiple opportunities for vocabulary development and for refining ideas and understandings, alongside ongoing review of their conclusions as new data is gathered. It is an opportunity for formative assessment providing chances to revise thinking as evidence accumulates.
- Although this lesson does not generate theoretical probability models (let's leave that to NIWA) this is an opportunity to compare, contrast and generally make use of the language of probability and understand how it applies to our everyday lives. It also is an example of critical understanding, and will hopefully lead ākonga to engage in questioning and seek to understand other probability statistics that they see on the internet.
- This longitudinal lesson provides many opportunities to make use of key vocabulary. Having a similar [wall display to this image](#) beside the data collection displays could engage ākonga to

make use of a wider range of vocabulary.



- It does not matter how many rounds you plan for and carry out, what matters is the ongoing discussion, comparison, and thinking that occurs, and ākonga understanding that data can change over time.



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

Sky Spies student materials

Resource list with preparation

Resource	Preparation required	Approx numbers
Sky Spies Data Recording Chart	Print out	One for each week of recording.

Sky Spies Data Recording Chart

Daily Data Log (Round ____) For _____

Day	Forecast %	Predicted? (Rain/No Rain)	Actually Happened?	Match? (✓ or X)
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