RICH MATHEMATICAL TASK BOOKLET

STATISTICS

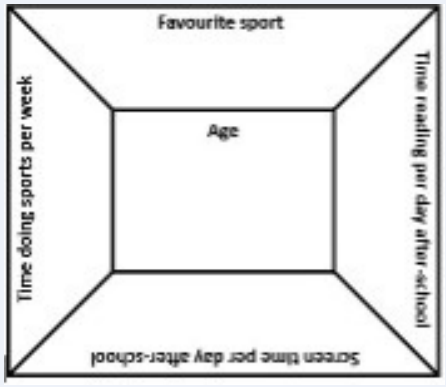
YEAR 5/6 EVEN YEARS

Teacher Booklet

© Bobbie Hunter and Jodie Hunter

Task 1

Health New Zealand is interested in the leisure activities of children. These data cards have different information about the activities of students of different ages.



What is the favourite sport of children at different ages?

Use a table of data to show your results. Now use a graph to record your results to present to the class.

Can you represent this in different ways?

What statements can you make about the favourite sports of students?

Teacher Notes

During the launch, have the students discuss the different aspects of data as represented on the card. Do not explicitly highlight the variables but allow students to notice these. Ask the students to choose one of the cards and tell a story about this. Ask students to make predictions about what they think the results would be for their age group for each piece of data and record these and put them away for task 3.

Provide students with a sub-set (could be age bound or across ages) of the data cards and orient students to the variable that will be a focus for the lesson (favourite sports).

Have grid paper, and dot stickers available for students to be able to construct graphs.

Expect students to represent using two different representations. This could include using the data cards themselves to build a graph, a table of data with tally marks or numbers, a picture graph using symbols, or a grid paper graph.

For the independent task, give the students a sub-set of the data cards (group them into age sets), grid paper, stickers, or stamps. Students could also make the graphs using https://nces.ed.gov/nceskids/createagraph/Default.aspx

Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical).

Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

Mathematical Language

Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, tally chart, bar graph, column graph.

Shareback

Select students to share who develop a graphical representation that clearly shows the data including a uniform simple symbol with spacing, alignment, and headings for the sets and numbers for the count.

Connect

Ask student to re-represent their graph as a bar graph using grid paper and felts to make a column graph.

Model how to make a bar graph using
https://nces.ed.gov/nceskids/createagraph/Default.aspx

Suggested Learning Outcomes

Collect, sort, and group data.

Display category data using different representations.

Communicate trends and patterns of data in meaningful ways.

Justify choice of display with reference to highlighted patterns.

Independent Tasks

The data cards have information about the favourite sport of students of different ages.

What questions could you ask about this data set?

Record your results in a table.

Can you represent this in different ways using a bar graph or column graph?

Make statements about what you have found out.

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Plan: ***How to use provided data, including identifying the variables of interest***

Analysis: Create and describe a variety of data visualisations to make meaning from the data, ***identifying features, patterns, and trends in context****, and including the variable and group of interest.*

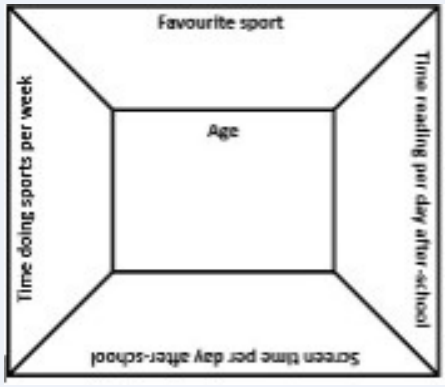
Conclusion: Answer the investigative question, comparing findings with initial conjectures or assertions and their existing knowledge of the world

Anticipations

Solutions, Misconceptions

Task 2

Health New Zealand is interested in the leisure activities of children. These data cards have different information about the activities of students of different ages.



How much time do children spend reading after-school?

Use a stem and leaf graph to show your results.

Make "I wonder" and "I notice" statements about the data.

Teacher Notes

To launch this task, model how to construct a stem and leaf graph with a set of data. Give students a sub-set of the data cards, select these so that students may have clusters in the data and potential outliers.

Have grid paper available for the students to use to develop their stem and leaf graph.

Facilitate the students to notice the main clusters and outliers in the data.

Mode is the most common value, range is the difference between the highest value and the lowest value, and median is the middle value. If a data set has a high range then it can be helpful to look at both the mode and the median as the mean can be skewed by the larger range in the values.

Monitor for students using vocabulary of statistics and model this for all students.

Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical)

Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

Mathematical Language

Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, stem-and-leaf graph, mode, median, range, cluster, outlier.

Shareback

Select students to share who make statements that highlight the main clusters and outliers in the numeric data. Record these statements onto the whiteboard and ask all students to agree and disagree with the statements with reasons. Facilitate students to notice and discuss that bar and column graphs show category data and stem-and-leaf graphs show numeric data.

Connect

Ask students to make statements about the shape of the data. Introduce or remind students of the concepts of mode, range, and median. Ask students to find these on their stem and leaf graphs. Engage students in a discussion of what each of those show and highlight.

Suggested Learning Outcomes

Develop an investigative question.

Develop survey questions that will help to answer an investigative question.

Display numeric data on a stem-and-leaf graph.

Make statements about data in response to an investigative question.

Communicate trends and patterns of data in meaningful ways including clusters, outliers, and shape of the data set.

Independent Tasks

Melvin and Khaleesi help their parents at home with the chores. They wonder how much time other tamarikiat their school spend helping their whanau with chores. Here is the results they collected showing how many minutes a group of tamariki in the school spend doing chores in the weekend.

15 23 8 12 25 65 0 20 15 21 30

0 28 10 25 21 18 22 25 32 5 35

26 20 25 30 16 24 25 10 15

Can you put the data into a stem and leaf graph?

Make "Iwonder" and "I notice" statements about the data.

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Plan: ***How to use provided data, including identifying the variables of interest***

Analysis: Create and describe a variety of data visualisations to make meaning from the data, ***identifying features, patterns, and trends in context,*** *and including the variable and group of interest.*

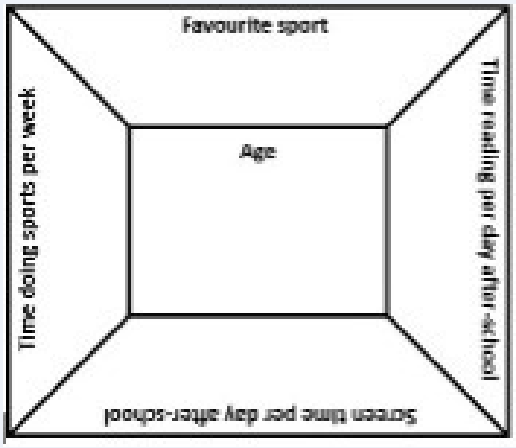
Conclusion: Answer the investigative question, comparing findings with initial conjectures or assertions and their existing knowledge of the world

Anticipations

Solutions, Misconceptions

Task 3

Health New Zealand is interested in the leisure activities of children. These data cards have differentinformation about the activities of students of different ages.



What do you wonder about the data? Make "I wonder..." statements.

What questions could you ask about this data set?

Choose one question and sort the data cards to answer the question.

Now record your results as a representation.

Make "I notice" statements about the data in relation to your question.

What connections can you make between the different sets of data?

Teacher Notes

With the whole class before you launch the task, discuss with the students how helping around the home and doing things together for leisure is one way of showing aroha for your whanau.

Support your classto develop questions that they could investigate about helping around the home and doing things together for leisure. Ask them to draft five questions that they could use on the data cards to answer their key question [note this could be a literacy activity]. These questions should offer opportunities for students to collect multi-variate data and include both category and numeric sets of data (e.g., different variables such as age, gender, and time spent doing chores, or types of chores).

Record the five questions and ask students from other classes in the school to complete the data cards and return these for Task 5. Ensure that the questions are appropriate and if necessary help students re-write or re-word the questions.

Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical).

Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

Predictions can be made through using sets of data.

Outcomes can have different likelihoods, and these can vary.

Mathematical Language

Statistics, data, category data, whole number data, multivariate data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, justify, outcomes, trends, stem and leaf graph, bar graph, column graph, dot plot, range, mode, median, shape, cluster, outliers.

Teacher Notes *(continued)*

Facilitate the students to make "I wonder" statements. These are not questions but they can be re-shaped into questions. If needed model how to develop the statement into a question.

Have grid paper available to develop graphs. This could be as a bar graph or column graph. Expect students to represent using two different representations. This could include using the data cards themselves to build a graph, a table of data or grid paper graph. Students could also make the graphs using https://nces.ed.gov/nceskids/createagraph/Default.aspx

For the independent task, give the students a sub-set of the data cards and grid paper, or alternatively the graphs could be created using https://nces.ed.gov/nceskids/createagraph/Default.aspx or https://www.geogebra.org/m/BxqJ4Vag

Shareback

Select students to share who have selected an appropriate graphical representation for the data set and have developed a clear representation with labels. Record the student statements related to their graph.

Connect

Ask to look at their initial predictions about the responses to the questions and see whether they now agree or disagree with these.

Model to students how to represent data using a dot plot and then give students a sub-set of the data related to time spent reading and ask them to construct a dot plot using the stickers.

Introduce students to how to develop a dot plot using https://www.geogebra.org/m/BxqJ4Vag

Suggested Learning Outcomes

Collect and sort groups of data.

Analyse and display appropriate data using different representations.

Ask investigative questions about a set of data.

Communicate trends and patterns of data in meaningful ways.

Justify choice of display with reference to highlighted patterns.

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Problem: Use multivariate data to investigate summary and comparison situations by:
– posing an investigative question that can be answered with data

Plan: ***How to use provided data, including identifying the variables of interest***

Analysis: Create and describe a variety of data visualisations to make meaning from the data, ***identifying features, patterns, and trends in context,*** *and including the variable and group of interest.*

Conclusion: Answer the investigative question, comparing findings with initial conjectures or assertions and their existing knowledge of the world

Independent Tasks

These data cards have different information about the activities of students of different ages.

What questions could you ask about this data set?

Sort the data cards to answer your question.

Record your results in a table.

Represent your results using at least two different graphs.

Make statements about the data.

Anticipations

Solutions, Misconceptions

Task 4

Robertson Road is planning a street party to celebrate Matariki.
The organisers would like to know how many people live in houses in this area so they can get enough kai for the party.

Can you sort and organise the set of data below showing how many people live in our houses?

4	5	3	2	4	1
5	6	6	3	4	10
2	6	2	5	8	1
4	5	2	4	2	3
2	4	5	3	5	4

Represent the data and record your results as a representation.

Can you find the mode, median and range?

What does this tell you about the set of data? What advice would you give to the street party organisers?

Teacher Notes

During the launch, ask students to discuss the types of graphs that can be used to represent category data and the types of graphs that can be used to represent numeric data (stem and leaf graph or dot plot). Let students chose their data display but support them to notice they need to be representing numeric data.

Have grid paper available and stickers for the dots or provide students with access to https://www.geogebra.org/m/BxqJ4Vag to make a dot plot.

Monitor for students using the vocabulary of statistics including shape, cluster, outlier, range, mode, median.

For the independent task, have multi-link cubes available for students to work out the mean.

Shareback

Select students to share who make statements that highlight the main clusters and outliers in the numeric data. Record these statements onto the whiteboard and ask all students to agree and disagree with the statements with reasons.

Big Ideas

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical).

Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

Predictions can be made through using sets of data.

Mathematical Language

Statistics, data, category data, whole number data, multivariate data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, justify, outcomes, trends, mode, median, range, average, mean, cluster, outlier, stem and leaf graph, dot plot.

Connect

Use multi-link cubes and represent each household. Ask the students to sort these into order from smallest to biggest.

Show the students how we can find the average or the mean number of hours of chores by re-grouping the cubes.

Suggested Learning Outcomes

Sort and group data.

Display numeric data using a stem and leaf graph or a dot plot.

Identify the shape of the data including clusters and outliers.

Find the mode, median, and range of a set of data.

Communicate trends and patterns of data in meaningful ways

Independent Tasks

Mereana is the goal shooter for the net-ball team. She decided to work out her statistics for goal shooting. Over 8 games, her mean was score was 5, the median was 6, and the mode was 7.
What might her scores be for each game?

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Plan: ***How to use provided data, including identifying the variables of interest***

Analysis: Create and describe a variety of data visualisations to make meaning from the data, ***identifying features, patterns, and trends in context,*** *and including the variable and group of interest.*

Conclusion: Answer the investigative question, comparing findings with initial conjectures or assertions and their existing knowledge of the world

Anticipations

Solutions, Misconceptions

Task 5

Helping around the home and doing things together for leisure is one way of showing aroha for your whanau.

Read the questions that you wrote for your data cards and make predictions about what the results will be.

Sort the data cards into sets.

Make "I wonder" statements about the data represented on the data cards.

Write questions that you can investigate using the data.

Record your results to answer the questions.

Represent the data using different graphs.

What statements can you make about the data?

Teacher Notes

Students will need questions they formulated from Task 3.

Facilitate the students to make "I wonder" statements. These are not questions but they can be re-shaped into questions. If needed model how to develop the statement into a question. These questions should offer opportunities for students to investigate multi-variate data and make comparisons and draw conclusions. Ensure that the questions are appropriate and if necessary help students re-write or re-word the questions.

Notice students who are able to sort and record the data in a systematic manner using a table of data. Facilitate students to sort systematically if needed.

Expect students to represent using different types of graphs and selecting these based on the type of data (e.g., category vs numeric data). This could include bar graphs, pie charts, dot plots, stem and leaf graphs and using comparative data displays. Students could also be provided with opportunities to use online tools to develop different graphical representations. Two options for online tools are: https://nces.ed.gov/nceskids/createagraph/Default.aspx (this provides options to make bar graph, pie graph, line graph, and area graph) and https://www.geogebra.org/m/BxqJ4Vag (dot plot).

Facilitate the students to notice the main clusters and outliers in the data and to make connections to their investigative question.

For the independent task, students continue to work on their statistical investigation and could construct graphs using online tools.

Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical.

Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

Predictions can be made through using sets of data.

Mathematical Language

Statistics, data, category data, whole number data, multivariate data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, justify, outcomes, trends, average, minimum, maximum, median, mode, range, compare, mean, cluster, outlier, bar graph, pie, line graph, stem and leaf graph, dot plot.

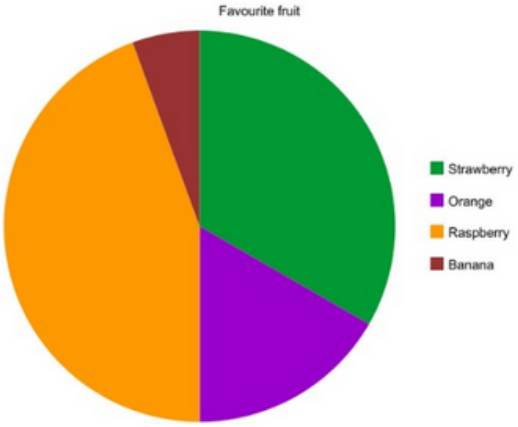
Shareback

The sharing back for this task will be in the next lesson. Bring the students back together to examine different types of graphs during the connect.

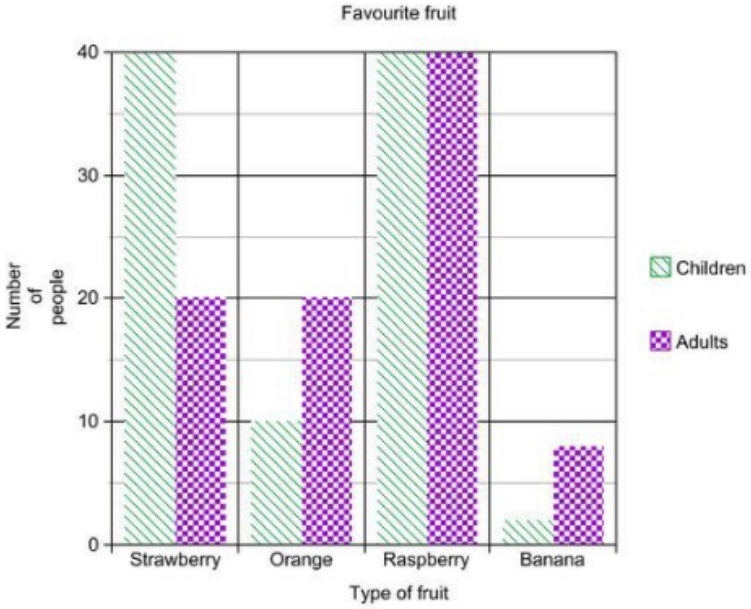
Connect

Support students to notice that bar graphs show number differences and can also be used to compare multi-variate groups while line graphs illustrate the changes over time.

Look at this graph. What statements can you make from it?



Look at this graph. What statements can you make from it?



How does each graph give you information?

What type of information is each graph useful for showing?

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Problem: Use multivariate data to investigate summary and comparison situations by: – posing an investigative question that can be answered with data

Analysis: Create and describe a variety of data visualisations to make meaning from the data, ***identifying features, patterns, and trends in context,*** *and including the variable and group of interest.*

Conclusion: Answer the investigative question, comparing findings with initial conjectures or assertions and their existing knowledge of the world

Suggested Learning Outcomes

Collect, sort, and count data.

Analyse and display appropriate data using different representations.

Communicate trends and patterns of data in meaningful ways.

Communicate results through reference to a data display and statistical concepts including clusters, outliers, mean, mode, range, median.

Independent Tasks

Continue working on your graphs and representations from your data card investigation.

Represent your data using a variety of graphs.

What statements can you make about the data?

Anticipations

Solutions, Misconceptions

Task 6

Helping around the home and doing things together for leisure is one way of showing aroha for your whanau.

Develop a presentation for the class that includes your investigation questions and the graphs and data displays that answer your question.

Write statements and a conclusion about what you have found out.

Teacher Notes

During the launch, highlight to students that they should be focusing on organising a presentation of their data including statements and a conclusion to tell a story about what they have found out.

Monitor for students using the vocabulary of statistics including clusters, outliers, average, most, least, mode, median, range.

For the independent task, have the data displays generated by the students available along with their investigative question.

Shareback

Ask each group to share back their presentation including their question, data displays, statements, and conclusions. Facilitate the students to agree and disagree with the statements and conclusions.

Connect

Ask students to reflect on the use of different data displays and which graphs were useful to show different types of data and clusters, outliers, and overall patterns in the data.

Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical).

Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

Predictions can be made through using sets of data

Outcomes can have different likelihoods, and these can vary.

Mathematical Language

Statistics, data, category data, whole number data, multivariate data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, justify, outcomes, trends, average, minimum, maximum, median, mode, range, compare, mean, cluster, outlier, bar graph, pie, line graph, stem and leaf graph, dot plot.

Suggested Learning Outcomes

Collect, sort, and count data.

Analyse and display appropriate data using different representations.

Communicate trends and patterns of data in meaningful ways.

Communicate results through reference to a data display and statistical concepts including clusters, outliers, mean, mode, range, median.

Independent Tasks

Look at the investigative question and data display that matches this.

Write statements using “I wonder” and “I notice” from the data displays.

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Problem: Use multivariate data to investigate summary and comparison situations by:
– posing an investigative question that can be answered with data

Analysis: Create and describe a variety of data visualisations to make meaning from the data, ***identifying features, patterns, and trends in context,*** *and including the variable and group of interest.*

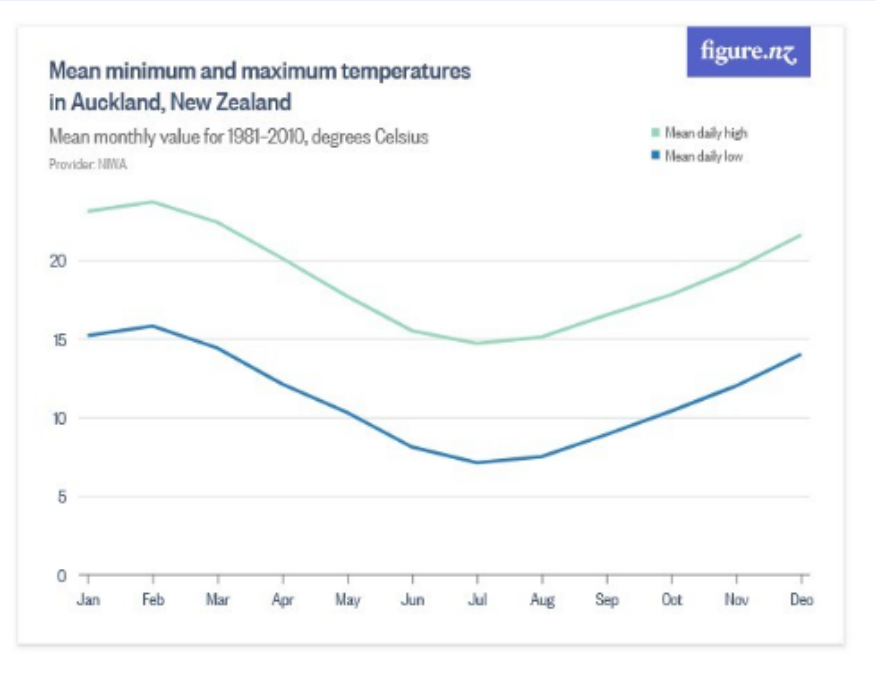
Conclusion: Answer the investigative question, comparing findings with initial conjectures or assertions and their existing knowledge of the world

Anticipations

Solutions, Misconceptions

Task 7

This graph shows the average (mean) coldest and hottest temperatures in Auckland over 29 years.



What do you notice? What do you wonder?
Can you make statements about this data?

The table below shows the temperature at each hour on the 1st of June 2022

12am	1am	2am	3am	4am	5am	6am	7am	8am	9am
17	17	17	16	16	17	16	16	16	17

10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm
18	20	20	20	21	20	20	19	18	17

8pm	9pm	10pm	11pm
18	16	16	16

Use the graph paper to make a line graph of the temperature on the 1st of June.

Compare this with the first graph.

Develop a set of "I wonder" and "I notice" statements.

Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical).

Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations. Predictions can be made through using sets of data.

Outcomes can have different likelihoods, and these can vary.

Mathematical Language

Statistics, data, time-series data, sample, investigate, organise, display, sort, represent, communicate, predict, justify, outcomes, trends, average, mode, median, range, line graph, minimum, maximum.

Teacher Notes

Introduce the task in two parts by giving students time to discuss and then agree or disagree with the graph before making 'I notice' and 'I wonder' statements about the data and graph.

Have graph or grid paper available for the students to develop the line graph.

Facilitate the students to notice the trends in the data and support them to justify any statements by referring to the evidence from the data display.

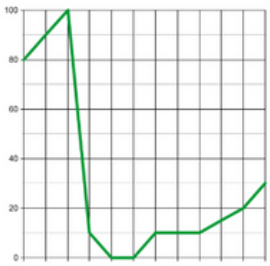
Notice whether the students recognise that the time series data is only from June and can be compared to the data presented for that month so the two graphs are showing different time series.

Shareback

Select students to share who use the data provided to make comparisons and draw appropriate conclusions. This should include identifying the trends in the data and using the data displays to justify their conclusions.

Connect

This is a graph of how hungry you are:



What times of the day might be shown on the graph?

Suggested Learning Outcomes

Evaluate statements related to data and use evidence to agree or disagree with these.

Compare and communicate trends and patterns of data in meaningful ways.

Develop statements about time series data.

Ask questions about time series data.

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

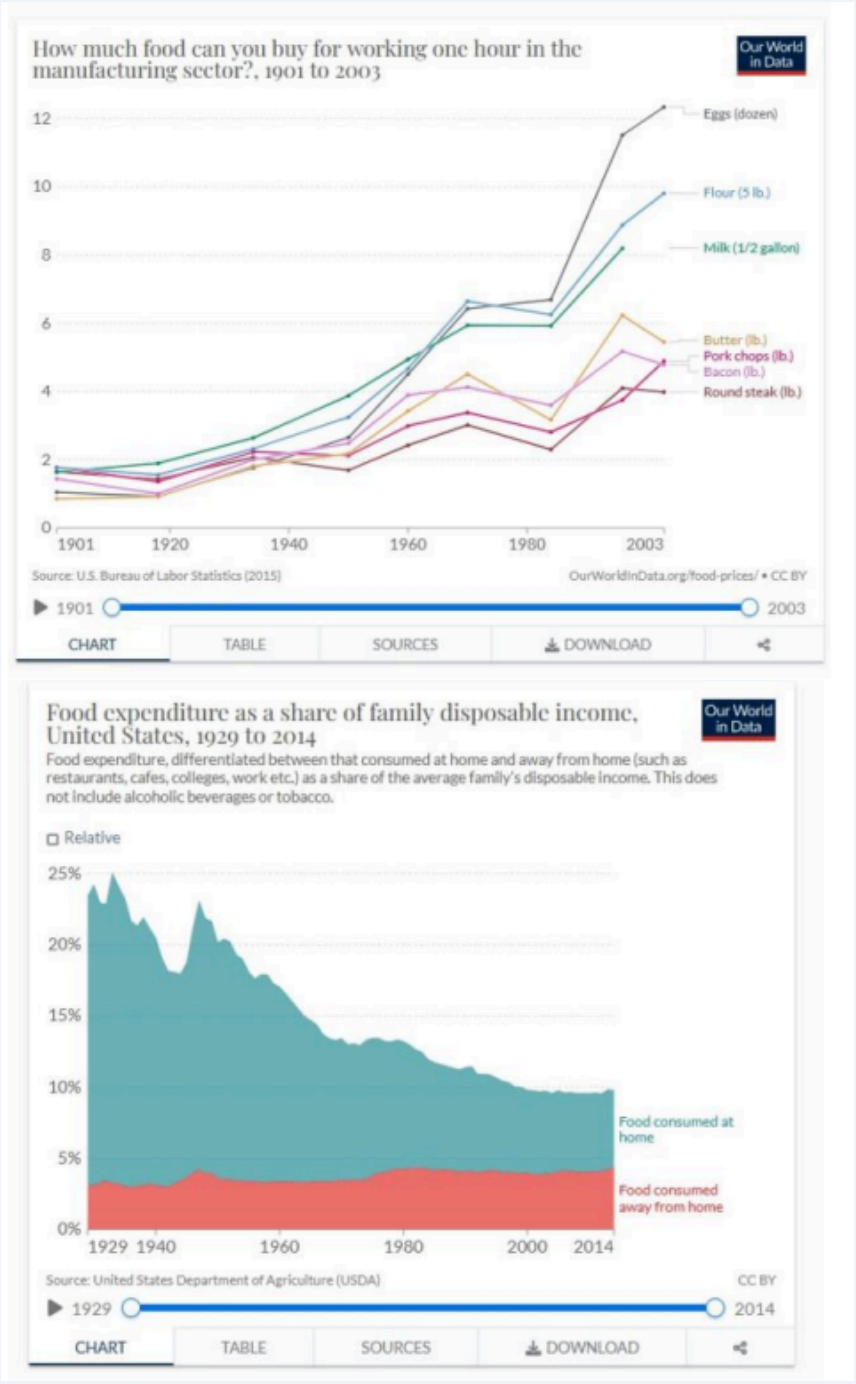
Statistical Literacy:
Identify, explain, *check, and, if necessary, improve features in others' data investigations (e.g., biased survey questions, misleading information or statements).*

Independent Tasks

The data on the graphs below show the cost of food over time in the USA.

Begin by writing "Iwonder" statements for each of the graphs.

Discuss what you notice in each graph and write "I notice" statements.



Anticipations

Solutions, Misconceptions

Task 8

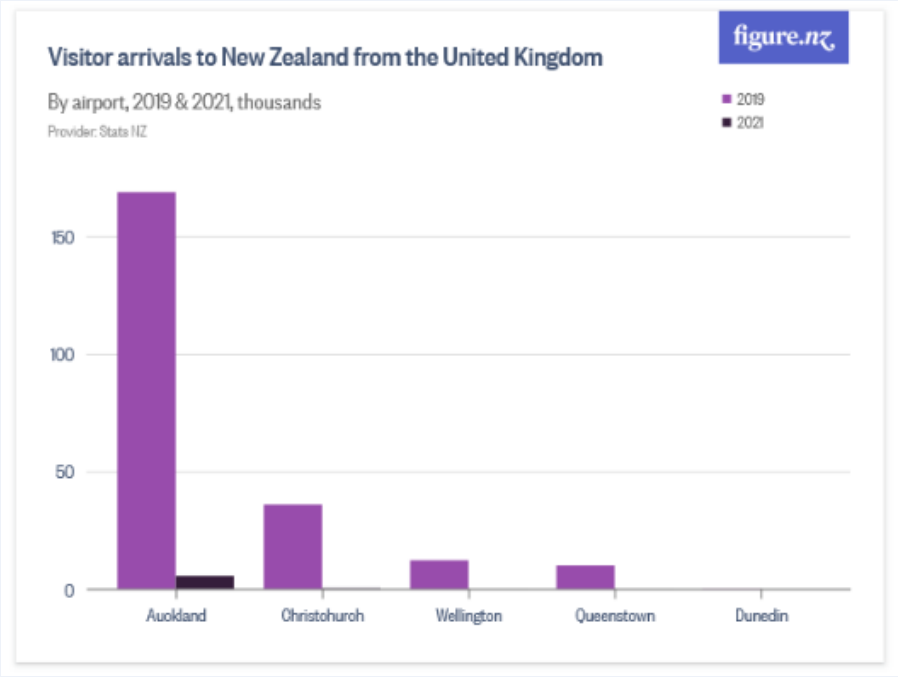
New Zealand is a popular tourist destination. We also have a lot of people living in New Zealand who have family in different countries.

Have a look at the graphs below and think of the stories that they are telling us.

Begin by writing "I wonder" statements for each of the graphs.

Discuss what you notice in each graph and write "I notice" statements.

What stories and conclusions can you write about the data shown in the graphs?



Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical)
.
Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

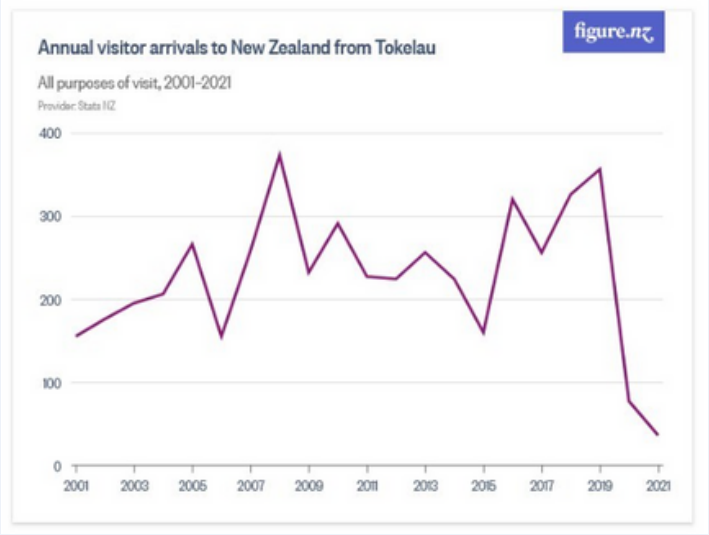
Predictions can be made through using sets of data.

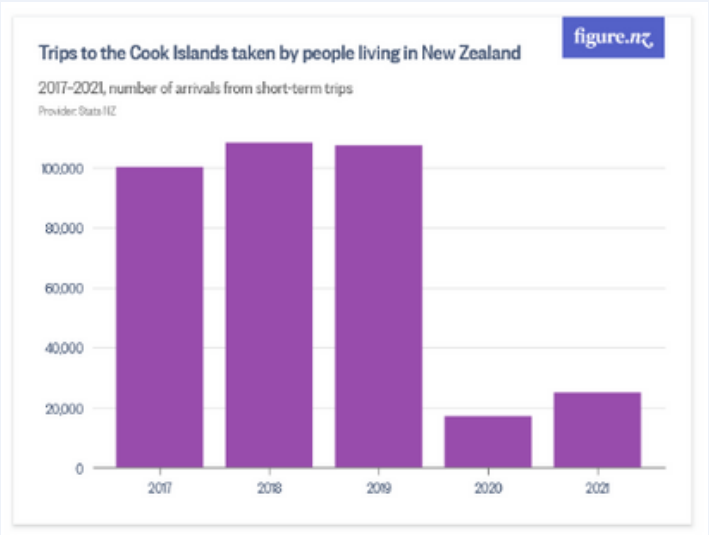
Outcomes can have different likelihoods, and these can vary.

Mathematical Language

Statistics, data, whole number data, multivariate data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, justify, outcomes, trends, average, minimum, maximum, compare, cluster, outlier, bar graph, time series data, line graph.

Task 8





Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Analysis: Create and describe a variety of data visualisations to make meaning from the data, ***identifying features, patterns, and trends in context,*** *and including the variable and group of interest.*

Statistical Literacy: ***Identify, explain,*** *check, and, if necessary, improve features in others' data investigations (e.g., biased survey questions, misleading information or statements).*

Teacher Notes

Introduce the task in parts by showing each graph to the class and having an in-depth discussion about what is shown.

Give students time to discuss and make statements about each graph prior to giving them the next graph. You may decide to project the graphs on a screen so that the students can see the colours clearly. Support them to develop the story each graph tells and to discuss the shape of the data.

·Support students to read the graphs carefully noticing the differences in the scales and discussing why this might be. For example, visitors from UK are measured by thousands while visitors from Tokelau is given as a total in hundreds.

Notice whether students are able to name the graph and type of data (e.g., bar graph, stacked bar graph) and to make sense of what is shown on each axis. Model the statistical language if necessary.

For the independent task, students could construct graphs using grid paper or by using online tools.

Shareback

Select students to share back who have developed a range of statements and conclusions from the graphs. Record the statements and the conclusions on the board or paper.

Connect

Ask students to agree or disagree with the statements that have been recorded. Facilitate students to collaboratively develop a conclusion in relation to the story told on the graphs.

Suggested Learning Outcomes

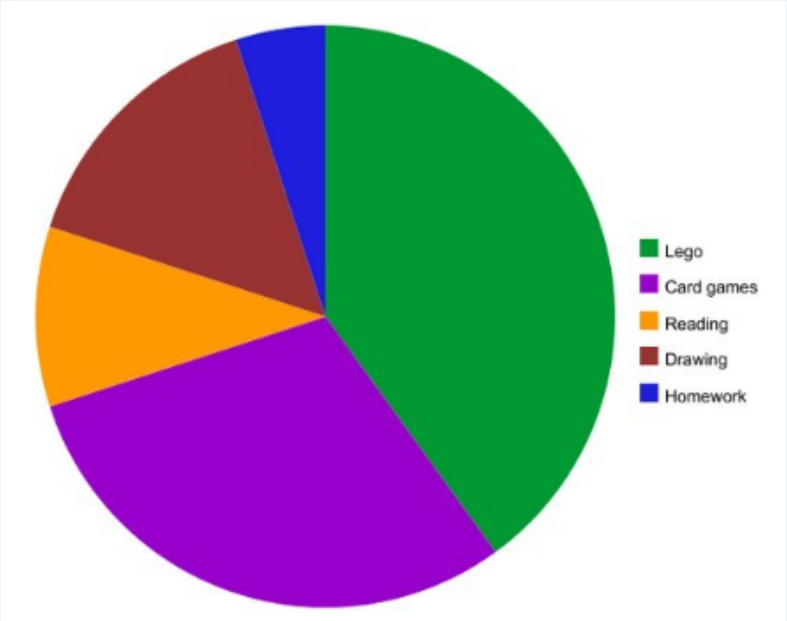
Communicate trends and patterns of data in meaningful ways.

Make and communicate statements by referring to a data display.

Agree and disagree with claims made by others by referring to a data display.

Independent Tasks

This is the results of a survey from a class at school.



What could the survey be about?

How many students do you think are in the class?

How many students choose each category?

Represent the data in a different way.

Anticipations

Solutions, Misconceptions

Task 9

The average (mean) temperature over a week was 20 degrees Celsius. The highest temperature was 25 degrees Celsius.

What might the temperature have been on the other days?

Draw a table to show the time-series data.

Represent the time-series data using a line graph.

Make statements about the temperature over the week.

Teacher Notes

·Notice whether students recognise that you can develop the set by combining numbers to 140 degrees over the week or alternatively by balancing pairs of temperature to make 40 degrees.
Check the reasonableness of the suggestions.

Have graph or grid paper available for the students to develop the line graph.

Facilitate the students to notice the trends in the data and support them to justify any statements by referring to the evidence from the data display.

For the independent task, have multi-link cubes available for students to use to find the mean. Have grid paper available to develop graphs.

Shareback

Select students to share who have either used a total 140 as a starting point to work out the other temperatures or those who have balanced 15 degrees with 25 degrees and then used pairs to balance to 40 degrees.

Connect

If the average (mean) temperature was 10 degrees Celsius over seven days and the highest temperature was 20 degrees Celsius, how could you work out the possible temperatures quickly?

Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical).

Data can be represented and communicated in multiple ways including data visualisations.

Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

Predictions can be made through using sets of data .
Outcomes can have different likelihoods, and these can vary.

Mathematical Language

Statistics, data, time-series data, sample, investigate, organise, display, sort, represent, communicate, predict, justify, outcomes, trends, average, mode, median, range, line graph, minimum, maximum.

Suggested Learning Outcomes

Generate a set of time-series data using an average as a starting point.

Display time-series data using a line graph.

Communicate trends and patterns of time-series data in meaningful ways.

Independent Tasks

The mean is 10. The median is 12. The data-set has 16 numbers. What might the numbers be?

Develop a story about the data-set and the question that it might be answering.

Represent your data-set and write statements about it.

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Data: Use a variety of tools to collect the data, and check for errors

Problem: Use multivariate data to investigate summary and comparison ***(and time-series situations)*** *situations with categorical and discrete numerical data, by:*

making conjectures or assertions about expected findings

Anticipations

Solutions, Misconceptions

Task 10

The Warehouse is ordering lego sets for the mid winter toy sale. They are looking at the sales in one shop during the sale last year. This is the data that they collected. Record the results in a table of data.

Creator	Friends	City
Harry Potter	Ninjago	Creator
Friends	City	City
City	Creator	Ninjago
Creator	Friends	Harry Potter
City	City	Harry Potter
Creator	City	Friends
Ninjago	Creator	Creator
Ninjago	Ninjago	Creator
Harry Potter	Friends	City
Creator	Creator	Creator
Friends	City	Harry Potter
Ninjago	Harry Potter	Creator
Friends	Creator	Creator
Harry Potter	City	Creator
Creator	Harry Potter	Harry Potter
Friends	Creator	Creator
Friends	Ninjago	City

Now show this as a graph.

What recommendations would you give to the Warehouse?

Teacher Notes

Expect students to represent using two different representations. This could include a table of data, a picture graph using symbols, or a bar graph.

Have grid paper, and dot stickers available for students to be able to construct graphs or students could also make the graphs using https://nces.ed.gov/nceskids/createagraph/Default.aspx

Shareback

Select students to share who have created clear data displays and can provide justification using the data for their recommendations to the Warehouse

Big Ideas

Ideas and questions about a specific topic can be investigated through collecting data and using it to answer the questions.

Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical).

Data can be represented and communicated in multiple ways including data visualisations.

Mathematical Language

Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, table of data, bar graph, column graph.

Connect

What other data and questions would be helpful to collect regarding the board game sales at the Warehouse?

Suggested Learning Outcomes

Collect, sort, and group data.

Display category data using different representations.

Communicate trends and patterns of data in meaningful ways.
Suggest areas to investigate using statistics.

Independent Tasks

Select the following assessment tasks (attached at the end of the document) as the independent activity:

Task 1 - Drink sales over a week.

Task 2 - Heights of students.

Task 3 - Column graph and pie graph.

Task 4 - Blah bands and boing bands.

Curriculum Links

During Year 5 and 6
(Year 6 only in bold)

Problem: Use multivariate data to investigate summary and comparison situations by: making conjectures or assertions about expected findings

Analysis: Create and describe a variety of data visualisations to make meaning from the data, ***identifying features, patterns, and trends in context,*** *and including the variable and group of interest.*

Conclusion: Answer the investigative question, comparing findings with initial conjectures or assertions and their existing knowledge of the world

Anticipations

Solutions, Misconceptions

Assessment Task 1 - Statistics - Year 5/6

This table shows the different types of drinks sold at a dairy over the week.

	MON	TUES	WED	THURS	FRI	TOTAL
Coke	4	7	4	9	3	27
Sprite	2	2	5	5	4	18
V Drink	10	13	10	15	9	57
Water	2	4	5	4	1	16
Primo	5	3	7	8	4	27
Juice	5	0	0	0	0	5
TOTAL	28	29	31	41	21	150

Make statements about the data using “I notice”.

What suggestions would you make to the dairy owner about which drinks to order?

Assessment Task 2 - Statistics - Year 5/6

This graph shows the measurement of heights of students from 101 cm to 159 cm.
Think about things such as the clusters, mean, mode, median and range.

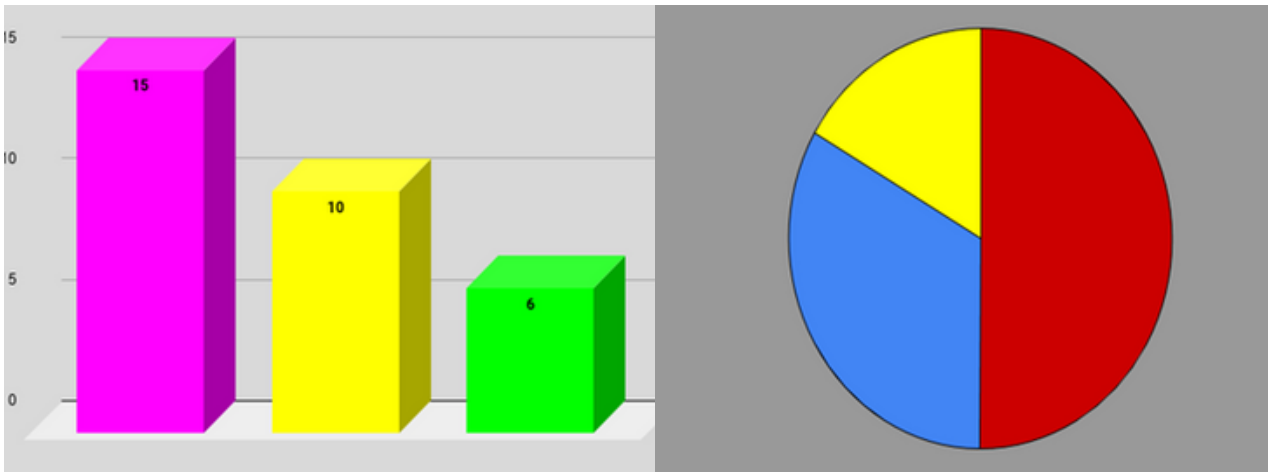
15	4, 5, 9
14	2, 3
13	1, 3, 5, 6, 6, 7, 7, 7
12	0, 0, 2, 3, 5, 5, 8
11	6, 7, 7, 9
10	1, 1, 3

What statements can we make about the heights of the students?

Assessment Task 3 - Statistics - Year 5/6

Could this column graph and pie graph be showing the same data?

Make sure you explain your answer.



Write a story about what the graphs might be showing.

Assessment Task 4 - Statistics - Year 5/6

A company was testing rubber bands to see which were stronger. They recorded in centimetres how far the rubber band stretched before it broke. Here are the results for the tests.

	Length of stretch at breaking point (centimetres)														
Blah Bands	50	57	45	55	47	53	54	49	50	46	52	50	52	48	53
Boing Bands	61	36	38	40	61	61	43	38	60	60	42	50	37	39	41

How can you organise and compare this data? Think about things like the mean, mode, median and range.

What statements can you make about the different types of rubber bands?

Which rubber bands do you think the company should sell? Why?