DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES

Statistics

Level 2 (Year 3 - 4)

Teacher Booklet

Level 2/Year 3-4: Statistics

Task 1	The local community centre will run a free sports holiday programme. They want to know about the favourite sports of children in the area. What sports do you play? How can you collect data to answer this question? Record your results to present to the class. Can you represent this in different ways?
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.

Curriculum links	**S2-1:** Conduct investigations using the statistical enquiry cycle:
	   ▪ posing and answering questions.
	   ▪ gathering, sorting, and displaying category and whole-number data.
	   ▪ communicating findings based on the data.
	NA-2-1: Use simple additive strategies with whole numbers.
	NA-2-2: Know forward and backward counting sequences while whole numbers to at least 1000.
	NA-2-3: Know the basic addition and subtraction facts.

Learning Outcomes: Students will be able to:	• Collect, sort, and count data. • Analyse and display appropriate data using different representations. • Group numbers to calculate a set. • Communicate results through reference to a data display with an emphasis on similarity and difference.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, category data, tally marks, graph, classify, represent, communicate, predict, outcomes, compare, similarities, differences.
Sharing back/Connect	Select students to share who develop representations that show the data clearly. This should include a simple symbol that is uniform and has similar spacing and alignment. **Connect:** Use the grid paper to make a representation of the data. What can be added to the graph to make it easier to count? [Support students to see that labelling the columns and adding numbers makes it easier to read]

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Teacher Notes	• Choose a topic of interest to your students and class (this could be linked to your inquiry topic). For example, this could be favourite sports, ways to get to school, favourite playground equipment, breakfast food. • Begin with your whole class by asking the students a question about the topic (e.g., What sports do you play?) that will generate category data. • Ask students for suggestions of how to record this quickly and model the use of tally marks. Record on a table with the type of sport, tally marks and numbers. {table} • Support students to find a way to represent each type of sport. Facilitate them to notice the advantages and disadvantages of different ways of representing. • Notice whether students recognise that it is easier to use small, simple symbols and have them organised in a line for each different category, so it is easier to compare them. Also notice students who realise that the same icon/symbol can be used to represent each type of sport. • Facilitate students to align the symbols as they record to make it easier to read. • For the independent task, have grid paper available for the students to construct graphs.

Table referenced above:

Sports	Tally	Number

Independent Tasks	The local library is going to buy some activities for children to borrow. They decided to ask children who visited what activities they would prefer out of board games, puzzles, card games, and drawing. This is the results they found:

Board games	Card games	Puzzles
Puzzles	Drawing	Board games
Board games	Puzzles	Card games
Drawing	Card games	Puzzles
Drawing	Board games	Puzzles
Card games	Board games	Drawing
Drawing	Drawing	Board games
Card games	Puzzles	Board games
Board games	Card games	Puzzles
Card games	Card games	Card games
Board games	Drawing	Board games
Card games	Board games	Board games

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	Record your results using a table of data and tally-marks.
	<table><tr><td>Activities</td><td>Tally</td><td>Number</td></tr><tr><td>Drawing</td><td></td><td></td></tr><tr><td>Board games</td><td></td><td></td></tr><tr><td>Card games</td><td></td><td></td></tr><tr><td>Puzzles</td><td></td><td></td></tr></table> Now represent this as a graph.
Anticipations	

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Task 2	Breakfast Club is putting in an order to the supermarket. What things might they want to find out? What questions could you ask to gather data? How can you collect data to answer this question? Record your results to present to the class. Can you represent this in different ways?
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.

Curriculum links	**S2-1:** Conduct investigations using the statistical enquiry cycle:
	  ▪ posing and answering questions.
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	  ▪ communicating findings based on the data.
	NA-2-1: Use simple additive strategies with whole numbers.
	NA-2-2: Know forward and backward counting sequences while whole numbers to at least 1000.
	NA-2-3: Know the basic addition and subtraction facts.

Learning Outcomes: Students will be able to:	• Collect, sort, and organise data. • Analyse and display appropriate data using different representations. • Group sets in different ways to find a total. • Communicate results through reference to a data display with an emphasis on similarity and difference.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, category data, tally marks, graph, classify, represent, communicate, predict, outcomes, compare, similarities, differences.
Sharing back/Connect	Select students to share who develop representations that show the data clearly. This should include a simple symbol that is uniform and has similar spacing and alignment. **Connect:** Use the grid paper to make a vertical representation of the data. Now make a column graph to represent your data. What makes the representation clear and easy to read?

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Teacher Notes	
	• Choose a topic of interest to your students and class (this could be linked to your inquiry topic). For example, this could be breakfast foods, helping at home or leisure activities. It should be a topic where students can ask different questions. • During the launch, ask the students to brain-storm things that they could find out related to the overall topic. Make a list on the board of all the suggestions. Ask students to firstly develop a question that they would use to collect the data and then to think about how they will record the data collected. Ensure that it is a workable question or help them to reframe the question. • Notice students who are able to collect and record the data in a systematic manner using tally marks or a table of data. • Provide students with post it notes or grid paper to develop graphs and also notice how they align the symbols to make it easier to read and whether they use headings for the columns and numbers for the count. • For the independent task, have grid paper available for the students to construct graphs.
Independent Tasks	The Warehouse is ordering board games 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.

Scrabble	Monopoly	Game of life
Guess who	Mancala	Monopoly
Scrabble	Scrabble	Monopoly
Monopoly	Monopoly	Monopoly
Guess who	Game of life	Guess who
Monopoly	Guess who	Game of life
Game of life	Monopoly	Scrabble
Monopoly	Monopoly	Guess who
Guess who	Scrabble	Mancala
Mancala	Game of life	Scrabble
Guess who	Guess who	Monopoly
Monopoly	Guess who	Monopoly

Record your results using a table of data and tally-marks.

Activities	Tally	Number
Mancala		
Guess who		
Scrabble		
Monopoly		
Game of life		
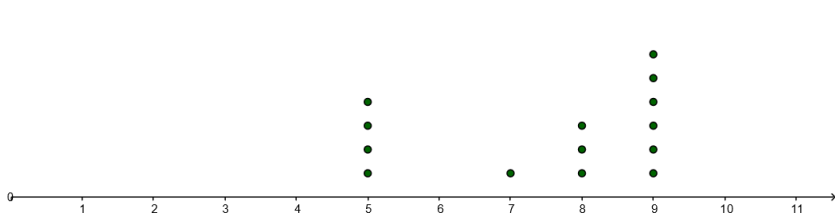
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	Now represent this as a graph.
Anticipations	

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Task 3	The local council is looking at funding for roads, bike lanes, and public transport. They want to know about travel to schools. The data cards have information about how students of different ages come to school. **Transport to school** **Time to get to school** **Car** **18 min** **8 years** Age What do you wonder about the data? Make "I wonder…" statements. What questions could you ask about this data set? Sort the data cards into sets. Record your results in a table. Can you represent this in different ways using a graph? What statements can you make about 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.

Curriculum links	**S2-1:** Conduct investigations using the statistical enquiry cycle:
	  ▪ posing and answering questions.
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	NA-2-1: Use simple additive strategies with whole numbers.
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Learning Outcomes: Students will be able to:	• Collect, sort, and group data.

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	- Analyse and display appropriate data using different representations. - Group sets to add them in different ways. - Communicate results through reference to a data display with an emphasis on similarity and difference.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, tally chart, graph, dot plot.
Sharing back/Connect	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:** Give students dot stickers and ask them to use a sub-set of the numerical data to create a dot plot following a template modelled on the board (e.g., time that 8 year olds take to walk to school). As the students to make statements about what they notice.
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, (e.g., "this is a six-year-old student who walks to school. It takes them 15 minutes to walk to school"). - 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 (Year 3), 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 set of the data cards, grid paper, stickers, or stamps.

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Independent Tasks	The data cards have information about how students of different ages come to school. 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 dot plot?
Anticipations	

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Task 4	A way of showing aroha for yourself is by doing physical activity. A group of children decided to track how much physical activity they did in a day using a fitness tracker watch. These are their results in minutes. 15 55 75 30 52 5 32 59 55 42 48 50 55 29 60 35 Organise the results into a stem-and-leaf graph. Make "I wonder" and "I notice" statements about 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.
Curriculum links	**S2-1:** Conduct investigations using the statistical enquiry cycle: ▪ posing and answering questions. ▪ gathering, sorting, and displaying category and whole-number data. ▪ communicating findings based on the data. **NA-2-1:** Use simple additive strategies with whole numbers. **NA-2-2:** Know forward and backward counting sequences while whole numbers to at least 1000. **NA-2-3:** Know the basic addition and subtraction facts.
Learning Outcomes: Students will be able to:	• 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 investigate question.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, stem-and-leaf graph, cluster, outlier, middle, median.
Sharing back/Connect	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. **Connect:**

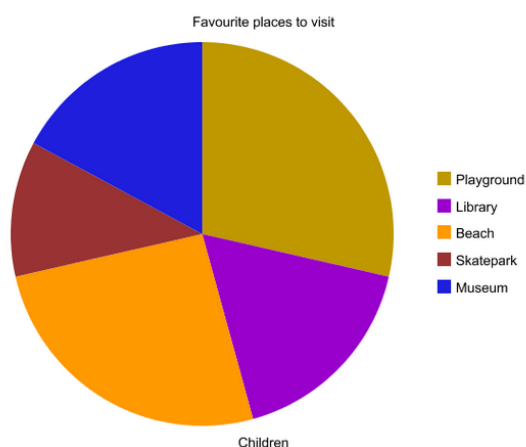|	
	Display graph representations that were developed from Task 1 or 2 and ask students to make statements about these. Write 3-4 of the statements on the whiteboard and ask students to agree or disagree with these. Facilitate students to notice that bar and column graphs show category data and stem-and-leaf shows numeric data.
Teacher Notes	• With the whole class before you launch the task, discuss with the students how helping around the home is one way of showing aroha for your whanau (alternatively choose a relevant topic to your students or link this to your inquiry topic). Support your class to develop questions that they could investigate about children helping around the home. Ask them to draft three questions that they could use on the data cards to answer their key question [note this could be a literacy activity]. Record the three questions and ask another class in the school to complete the data cards and return these for Task 5. • To launch this task, model how to construct a stem and leaf graph with a set of data. • 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. For example, 75 minutes and 5 minutes are the outliers and the main cluster is around 55 minutes for exercise. • Monitor for students using vocabulary of statistics and model this for all students. • For the independent task, give the students grid paper, stickers, or stamps.
Independent Tasks	Malia thinks that it is not fair that she is only allowed 30 minutes screen time after school each day. She decides to find out how much screen time, the other students in her class are allowed after-school each day. These are the results she found in minutes: 0 15 35 20 10 25 40 35 30 0 10 15 30 45 0 20 25 30 20 Can you organise the data into a stem and leaf graph or a dot plot? Make statements about what Malia found. Do you think she could use the data to convince her parents that she should have more screen-time?

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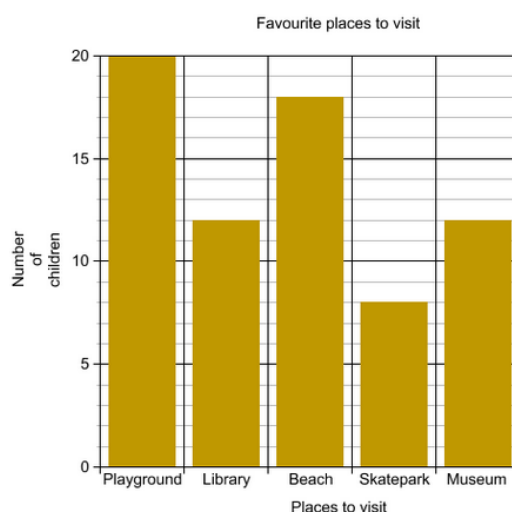| Anticipations	

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Task 5	Helping around the home 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. Record your results to present to the class. Represent the data using at least two graphs. What statements can you make about 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.

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Learning Outcomes: Students will be able to:	• Collect, sort, and count data. • Analyse and display appropriate data using different representations. • Find the total of sets by grouping to add. • Communicate results through reference to a data display with an emphasis on similarity and difference.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, stem-and-leaf graph, bar graph, column graph, pie chart.
Sharing back/Connect	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:**

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	Look at this graph. What statements can you make about this? **Favourite places to visit** *(pie chart with legend: Playground, Library, Beach, Skatepark, Museum)* Children Look at this graph. What statements can you make from it? **Favourite places to visit** *(bar graph showing Number of children on y-axis (0 to 20) and Places to visit on x-axis: Playground 20, Library 12, Beach 18, Skatepark 8, Museum 12)* How does each graph give you information?
Teacher Notes	• Notice students who are able to collect and record the data in a systematic manner using tally marks or a table of data. • Expect students to represent using two types of representations. This could include using the data cards themselves to build a graph (Year 3), a table of data with tally marks or numbers, a picture graph using symbols, or a grid paper graph, stem and leaf graphs, and dot plots. • Have grid paper, dot stickers, stamps for students to construct graphs. • Students could also be provided with opportunities to use online tools to develop different graphical representations after they have developed these by hand. Two options for online tools are: https://nces.ed.gov/nceskids/createagraph/Default.aspx (this provides options to make bar graph, pie graph, line

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	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. • Monitor for students using the vocabulary of statistics. • For the independent task, students continue to work on their statistical investigation and could construct graphs using online tools.
Independent Tasks	Continue working on your graphs and representations from your data card investigation. Represent your data using at least two graphs. What statements can you make about the data?
Anticipations	

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Task 6	Helping around the home is one way of showing aroha for your whanau. Develop a presentation for the class that includes your investigation question and the graphs and data displays that answer your question. Write statements and a conclusion about what you have found out.
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.

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Learning Outcomes: Students will be able to:	• Collect, sort, and group data. • Analyse and display appropriate data using different representations. • Communicate results through reference to a data display with an emphasis on similarity and difference.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, stem-and-leaf graph, bar graph, column graph, pie chart, tally marks.
Sharing back/Connect	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.

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

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Task 7	Hours of exercise over a week
	Read the statements and say whether you agree or disagree with each one. 1) Most people do 9 hours or more of exercise a week. 2) Four people did 6 hours of exercise a week. 3) Most people do between 6 – 7 hours of exercise a week. 4) An outlier was a person who did one hour of exercise in the week. Write your own statements about the data shown in the graph. Favourite fruit Read the statements and say whether you agree or disagree with each one. 1) Pears are not a popular fruit. 2) The same number of people like apples and strawberries. 3) Less people like bananas than oranges. 4) Most people like strawberries. Write your own statements about the data shown in the graph.
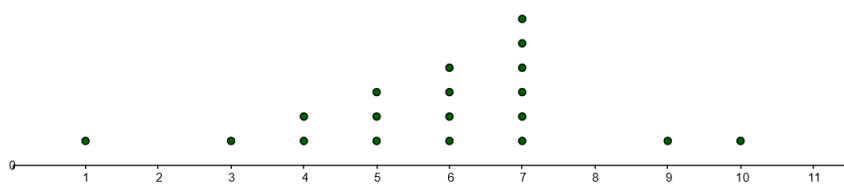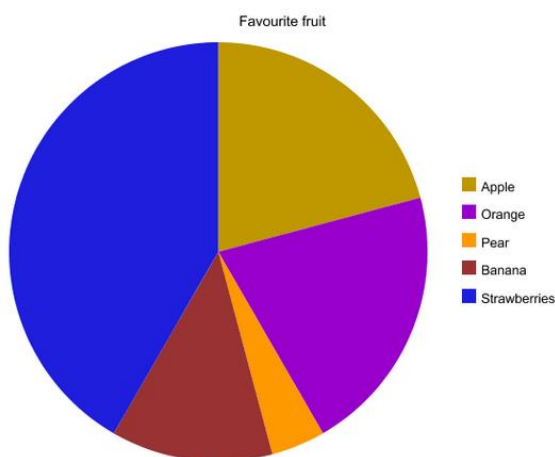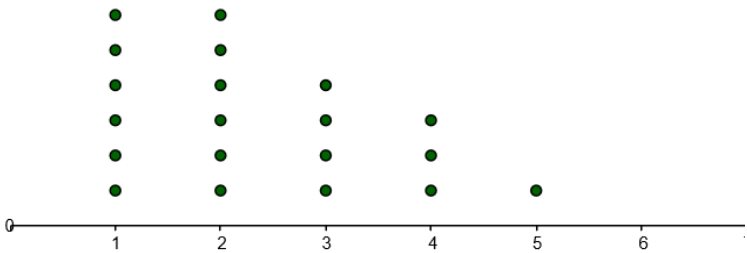
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Pets at home

Read the statements and say whether you agree or disagree with each one.

1) 16 boys have cats at home.
2) More girls have birds as a pet than boys.
3) Dogs are the second most popular pet.
4) Turtles are the least popular pet.

Write your own statements about the data shown in the graph

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.
Curriculum links	**S2-1:** Conduct investigations using the statistical enquiry cycle: - posing and answering questions. - gathering, sorting, and displaying category and whole-number data. - communicating findings based on the data. **NA-2-1:** Use simple additive strategies with whole numbers. **NA-2-2:** Know forward and backward counting sequences while whole numbers to at least 1000. **NA-2-3:** Know the basic addition and subtraction facts.
Learning Outcomes: Students will be able to:	Agree or disagree with statements about data displayed on a graph.

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	• Provide reasons and evidence for statements about data displayed on a graph. • Make statements about data displayed on a graph.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, bar graph, column graph, pie chart, dot plot graph, cluster, outlier.
Sharing back/Connect	Select students to share who share who are able to provide justification and evidence for the statements that they make. **Connect:** A class has been collecting data to organise a school disco. Different students have collected different data and they need your help to let them know which graph they should use to present their results. Kata collected data about her classmates favourite type of music. Leoni collected data about how long the disco should run for. Tasa collected data about what time the disco should be held for different age groups across the school. Can you make suggestions for what type of graph they should each use?
Teacher Notes	• Ask students to make statements about the graph. If needed, model a statement for the students or use questioning. • Record student statements on pieces of paper and when you have 3-4 statements, ask students to choose a statement and say whether they agree or disagree with a reason. • Notice students who provide reasons for their statements.
Independent Tasks	This is a graph of the results of a survey with the class. What might the survey be about? Give a range of possibilities.

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	Can you present the data in a different way?
Anticipations	

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Task 8	Sports, physical activity and playing are all ways to show aroha to ourselves. 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?
	Young people who went running, jogging or ran cross-country in New Zealand By location, 2017, % of young people aged 5-17 who had participated in the last 7 days Provider: Sport New Zealand figure.nz At school or in the school grounds At home Other outdoor locations Outdoor facilities Indoor facilities Somewhere else 0 20 40 60 **Reasons young people in New Zealand played (e.g. running around, climbing trees, make-believe)** 2017, % of young people aged 5-17 taking part in this activity Provider: Sport New Zealand figure.nz For fun To hang out with family or friends For fitness or health I'm good at it I have to (my parent/caregiver or school make me) To physically challenge myself or to win Another reason To lose or maintain weight To learn or practise a new skill To look good 0 20 40 60 80 **Young people in New Zealand who would like to do more physical activities for sport, PE, exercise or fun** By age group, 2018, % of young people Provider: Sport New Zealand figure.nz 80 60 40 20 0 5-7 8-11 12-14 15-17 Age group

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Participation in active recreation among young people in New Zealand

By selected top 40 sports and activities, 2017, % of young people aged 5-17

Provider: Sport New Zealand

figure.nz

- Running, jogging or cross-country
- Playing (e.g. running around, climbing trees, make-believe)
- Games (e.g. four square, tag, bull rush, dodgeball)
- Swimming
- Playing on playground (e.g. jungle gym)
- Cycling and biking (including mountain biking)
- Walking for fitness
- Trampoline
- Scootering
- Football, soccer or futsal
- Dance/dancing (e.g. ballet, hip hop etc)
- Workout (weights or cardio)
- Group exercise class (e.g. aerobics, CrossFit, Jump Jam)
- Basketball or Mini-ball
- Netball
- Tramping or bush walks
- Rugby or Rippa Rugby
- Athletics or track and field
- Touch
- Gymnastics (e.g. rhythmic, artistic)
- Cricket
- Kapa haka
- Hockey or floorball
- Skateboarding
- Handball
- Tennis
- Badminton
- Table tennis
- Volleyball or Kiwi Volley
- Softball or T-ball
- Parkour
- Karate
- Bodyboarding or boogie boarding
- Horse riding (e.g. Pony club)
- Fishing
- Rugby league
- Ultimate Frisbee
- Canoeing or kayaking
- Ki-o-rahi
- Water polo or Flippa Ball

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.
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Learning Outcomes: Students will be able to:	● Use graphs to generate questions about a topic. ● Use data presented on a graph to make statements and answer questions.

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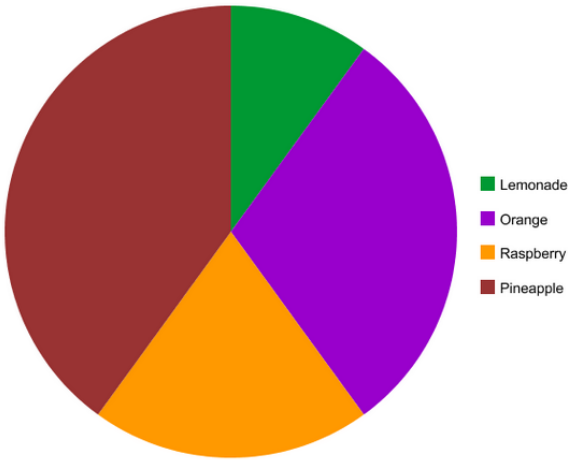
	• Communicate results through reference to a data display with an emphasis on similarity and difference.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, bar graph, column graph, pattern, trend, cluster.
Sharing back/Connect	Select students to share who are able to provide justification and evidence for the statements that they make and can develop a story from the graphs. **Connect:** Write the "I notice" statements developed by students on the board and ask the class to agree and display with these by giving reasons.
Teacher Notes	• Ask students to make statements about the graphs. If needed, model a statement for the students or use questioning. • Facilitate the students to notice that the different graphs show different sets of data however are all linked to the same over-arching theme. • Note, the graphs could be presented together or one at a time and students could make statements about each graph and then at the end use these to develop conclusions about the overall topic. • Monitor for students using the vocabulary of statistics including cluster, most common, least common, similar, outliers.
Independent Tasks	These are the results of a survey:

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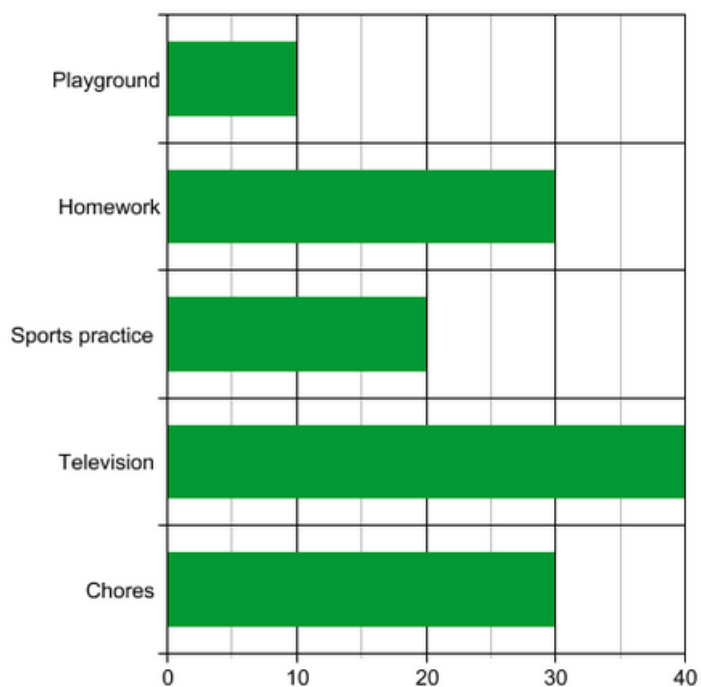
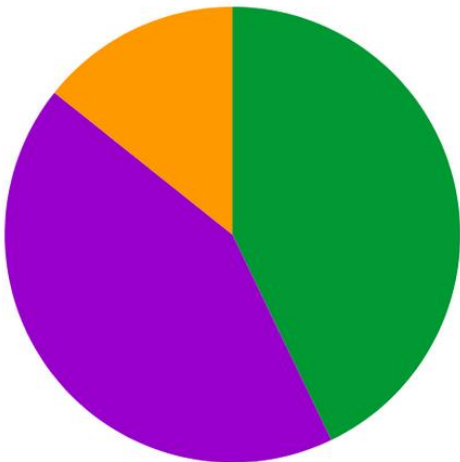|	
	What might the survey be about? Make "I wonder" and "I notice statements about the results.
Anticipations	

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Task 9 (optional task)	The graph shows the proportion of students in a class who prefer different ice-block flavours. How many students might be in the class? How many students prefer each flavour? Present the data using a different representation.
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.

Curriculum links	**S2-1:** Conduct investigations using the statistical enquiry cycle:
	   ▪ posing and answering questions.
	   ▪ gathering, sorting, and displaying category and whole-number data.
	   ▪ communicating findings based on the data.
	NA-2-1: Use simple additive strategies with whole numbers.
	NA-2-2: Know forward and backward counting sequences while whole numbers to at least 1000.
	NA-2-3: Know the basic addition and subtraction facts.

Learning Outcomes: Students will be able to:	• Analyse and display appropriate data using different representations. • Split a set or number in a proportional way.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, pie chart.
Sharing back/Connect	Select students to share who either begin with the total number and split this in a proportional way aligned with the pie graph or who allocate a number to each section of the pie graph and then calculate the total from this. For the second part of the task, select students who develop clear data representations.

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	Connect: What could this pie graph show? How many people could be in each part?
Teacher Notes	• Facilitate the students to notice that the proportion of students needs to be the same as the total number of students in the class and that each proportion should relate to the size of the segment. • Notice students who realise that you could choose a number and then divide this proportionally or that you could allocate numbers to the segments and then add these to find the total.
Independent Tasks	A graph of shoe sales from the Warehouse showed that the most shoes that sold in a week was sneakers, the next was jandals, and the least sales were for boots. What might the graph look like? How many of each type of shoe sold during the week?
Anticipations	

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Task 10 (optional task)	These graphs provide information about the height of people over time. 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.
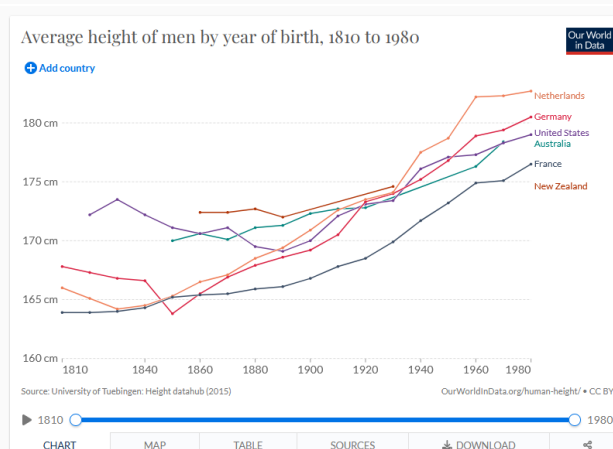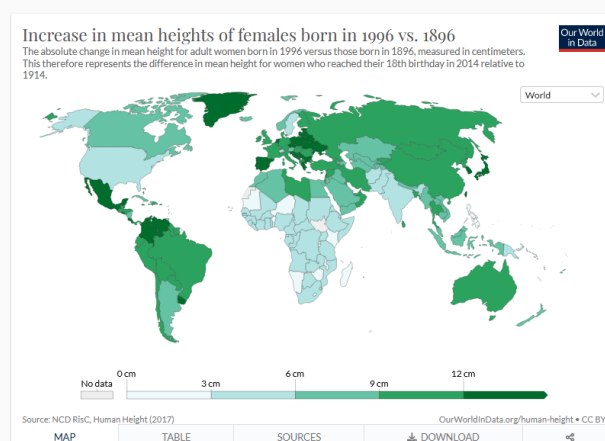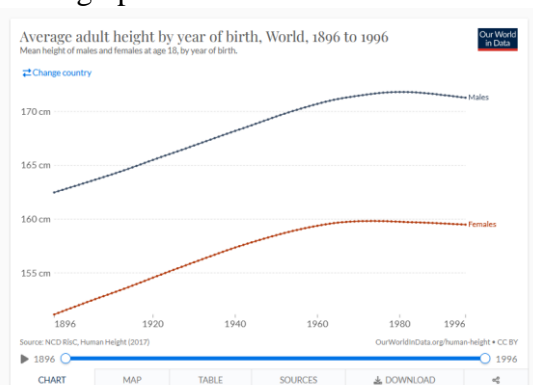
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	Data can vary in different ways (e.g., an object can be different sizes and colours) and it can be organised in different ways and by different characteristics (categorical, numerical). Data can be represented and communicated in multiple ways including data visualisations. Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.
Curriculum links	**S2-1:** Conduct investigations using the statistical enquiry cycle: ▪ posing and answering questions. ▪ gathering, sorting, and displaying category and whole-number data. communicating findings based on the data.
Learning Outcomes: Students will be able to:	• Use graphs to generate questions about a topic. • Use data presented on a graph to make statements and answer questions. • Communicate results through reference to a data display with an emphasis on similarity and difference.
Mathematical language	Statistics, data, sample, investigate, organise, display, sort, classify, represent, communicate, predict, outcomes, compare, similarities, differences, bar graph, line graph, pattern, trend, cluster.
Sharing back/Connect	Select students to share who are able to provide justification and evidence for the statements that they make and can develop a story from the graphs. **Connect:** Write the "I notice" statements developed by students on the board and ask the class to agree and display with these by giving reasons.
Teacher Notes	• Ask students to make statements about the graphs. If needed, model a statement for the students or use questioning. • Facilitate the students to notice that the different graphs show different sets of data however are all linked to the same over-arching theme. • Note, the graphs could be presented together or one at a time and students could make statements about each graph and then at the end use these to develop conclusions about the overall topic. • Monitor for students using the vocabulary of statistics including cluster, most common, least common, similar, outliers.
Independent Tasks	Select the following assessment tasks (attached at the end of the document) as the independent activity:

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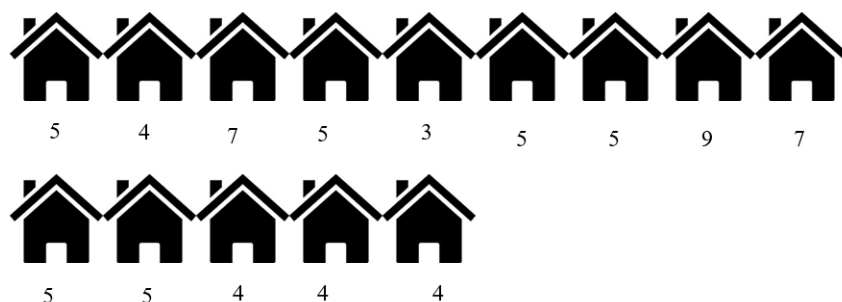|	
	S3: Number of people living in houses.
	S4: Favourite sports and time doing sports.
	S5: Drink sales at a dairy over a week.
Anticipations	

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DMIC
DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES
ASSESSMENT TASK

STATISTICS - INVESTIGATION: LEVEL 2   Task S3

5   4   7   5   3   5   5   9   7

5   5   4   4   4

A company is building new houses in a neighbourhood. Above is shown the number of people living in each house in the local area. What questions could you ask about this data?

Can you display the data using a table and/or a graph?

What statements can you make about the number of people living in houses in the area?
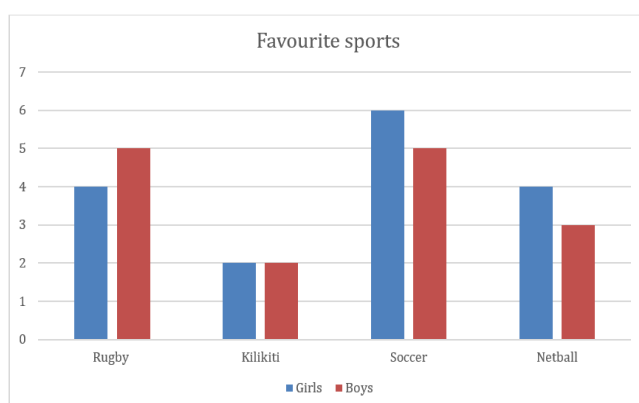
What would you advise the company in relation to how many bedrooms they should put in houses?

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DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES
ASSESSMENT TASK

STATISTICS - LITERACY: LEVEL 2 Task S4

These graphs show boys and girls favourite sports and the time spent doing sports each week.

Favourite sports

Hours playing sport per week
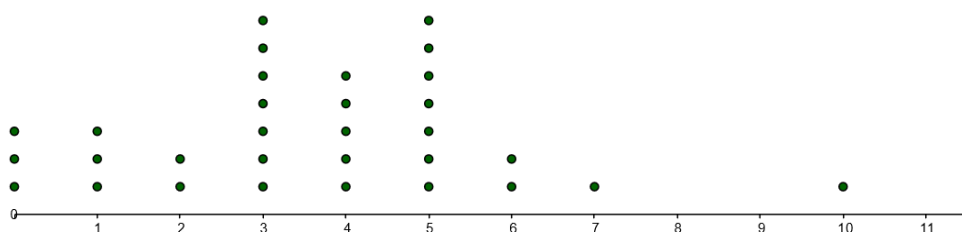
What questions can you ask about the graphs?

Make statements about the data using "I notice"

Make statements about the data in the graphs.

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ASSESSMENT TASK

STATISTICS - LITERACY: LEVEL 2-3

Task S5 [Teacher note: Students can use calculators to examine the data]

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?