RICH MATHEMATICAL TASK BOOKLET

STATISTICS

YEAR 2

Teacher Booklet

Task 1

What pets do the children in this class have?

Represent what you have found.

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 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 pets do you have at home?) that will generate category data.

Have each student show what pets they have by drawing a picture or writing a word on a large sheet of paper or the whiteboard.

Launch the task by asking the students to draw or write something that would show everyone what they found out in response to the question.

Notice student solution strategies that may include differing levels of organisation from drawing all the responses, grouping and ordering these, using numbers to represent or a table.

Shareback

Select students to share who use a variety of ways of representing indicating different levels of sophistication including grouping, drawing representations in a line, using numbers and drawing, words and numbers, or a table.

During the large group sharing back, support students to notice how the responses can be grouped and how the number in each category can be found.

If no students use a table, then model this and ask students to suggest what headings could be used and what to put in each column to make it clear. Record the data in a tabular form.

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

Problem: pose a summary investigative question about a group for which the data will have categorical variables (e.g., colour, brand), and anticipate what the data might show

Data: collect categorical data for one variable

Analysis: create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, giving the frequency for each category

Connect

How can the total number of pets be found from the recordings?
Ask students to find the total number of pets from their own recording and from the table and check these are the same].

How are your representations the same?
How are your representations different?
Which representations most clearly show the number of pets in each category?

Suggested Learning Outcomes

Collect, sort, and count data.

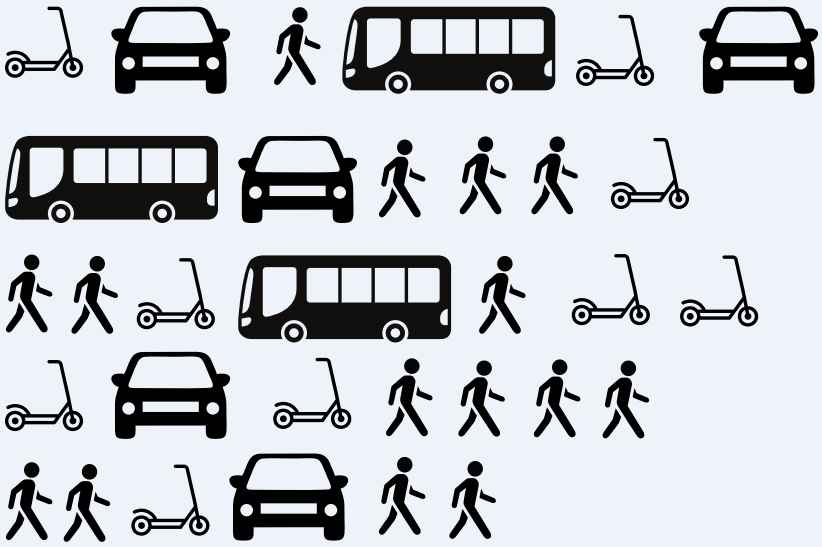
Display category data using different representations.

Count in different ways.

Use grouping to solve addition problems without counting every object.

Independent Tasks

This is how the children in Room 12 get to school.



How many children get to school in each way?
Represent what you have found using two different recordings.

Mathematical Language

Statistics, data, organise, display, sort, classify, represent.

Anticipations

Solutions, Misconceptions

Task 2

A new playground is being built at the park. The designers would like to know what equipment they should include.

What is the favourite playground equipment for students in this class?

How can you collect data to answer this question?

Record your results to present to the class.

Can you represent this in different ways?

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 games, pets, breakfast food.

Launch the task by asking students to suggest ways to collect the data and then allowing each student to collect and record the data in the way they have suggested.

Support students to find a way to represent each type of playground equipment. 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.

Shareback

For the first aspect of the task, select students to share who use different ways of representing each type of playground equipment including drawings/icons, symbols or words.

For the second aspect of the task, select students to share who have used a variety of ways of representing including grouping, drawing representations in a line, using numbers and drawing, words and numbers, or tables of 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.

Curriculum Links

Plan: plan survey and data-collection questions for collecting data,
identify who and what the data will measure, and discuss how the data-gathering process might affect people

Data: collect categorical data for one variable

Analysis: create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, giving the frequency for each category

Connect

What parts of the representation make it easy to see the results?

Redraw your representation so that it is easier to see the results.

Suggested Learning Outcomes

Collect data to answer a question.

Record, sort, count, and display the data collected.

Communicate the results of the investigation.

Count in different ways.

Use grouping to solve addition problems without counting every object.

Independent Tasks

Hamuera and Miriama are interested in the games that their families enjoyed playing when they were children. These are the responses that they collect:

Poi Whai Poi Rugby Te Rākau

Te Rākau Poi Rugby Poi Rugby

Whai Rugby Poi Whai Poi Poi

Rugby Te Rākau Rugby Whai

Rugby Poi Rugby Poi Whai Poi

Represent what you have found using two different recordings.

What statements can you make about games that the family enjoyed playing?

Mathematical Language

Statistics, data, organise, display, sort, classify, represent.

Anticipations

Solutions, Misconceptions

Task 3

What do the children in this class have for morning tea today?

Record your results in a table.

Can you represent this in different ways?

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 food, sports, toys.

Before you launch the task, ask students to make a drawing from memory that shows how many students in this class had each activity at the playground as their favourite [previous task].

During the launch, ask the students what food they have for morning tea in their lunchbox and make a list on the board of all the different food types. 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 food, tally marks and number Support students to count in fives]=.

Type of Food	Tally	Number

Support students to find a way to represent each type of food. 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 food.

Facilitate students to align the symbols as they record to make it easier to read.

Shareback

Select students to share who have used the same symbol or icon to represent one type of food in contrast to a different type of food.

Also notice and select a student whose picture shows that there are more of one type of food than others without having to count or read the numbers. If no students have developed a representation that shows this, model how it could be recorded.

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

Problem: pose a summary investigative question about a group for which the data will have categorical variables, and anticipate what the data might show

Data: collect categorical data for one variable

Analysis: create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, giving the frequency for each category

Connect

During the connect, support students to notice that they need to use a simple symbol, draw the correct number, and have them in rows and lined up vertically.

What parts of the representation make it easy to see the results?

Redraw your representation so that it is easier to see the results.

Suggested Learning Outcomes

Collect, sort, and count data.

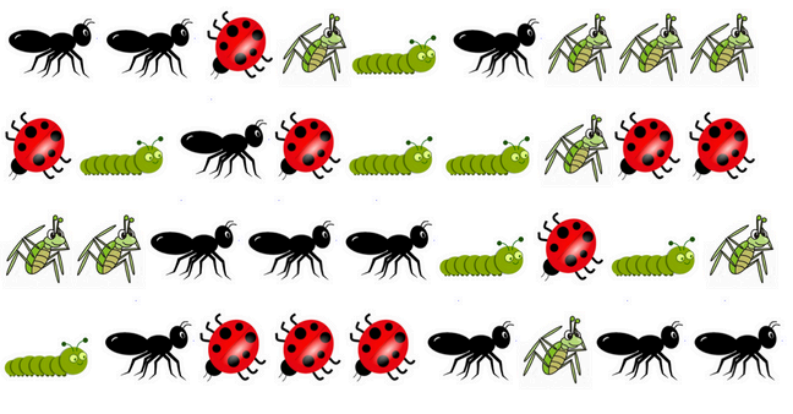
Display category data using different representations.

Count in different ways.

Use grouping to solve addition problems without counting every object.

Independent Tasks

Lydia wanted to see how many different insects were in her garden.
This is what she saw:



Complete the table:

Ladybug			
Cicada			
Caterpillar			
Ant			

Draw a representation to show this data.

Mathematical Language

Number words (e.g., one, two, three...).

Anticipations

Solutions, Misconceptions

Task 4

Draw a picture graph that shows the data of the food for morning tea.

Draw another picture graph that only uses one symbol.

What statements can you make about that data?

Teacher Notes

During the launch, re-visit the previous task with the students and let them look at the picture graphs that were developed. Ask them to discuss what helps to make the picture graph clear and easy to see. Challenge them to develop a picture graph that is better than what they developed yesterday.

Have grid paper available for the connect.

Facilitate the students to notice that using a uniform simple symbol and using similar spacing and alignment makes the graph easier to read.

For the independent task, have grid paper available for the students to construct graphs.

Shareback

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]

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

Analysis: create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, giving the frequency for each category

Suggested Learning Outcomes

Record, sort, count, and display the data collected.

Use picture graphs and grid paper graphs to represent data.

Make statements about data that has been collected to answer a question.

Count in different ways.

Use grouping to solve addition problems without counting every object.

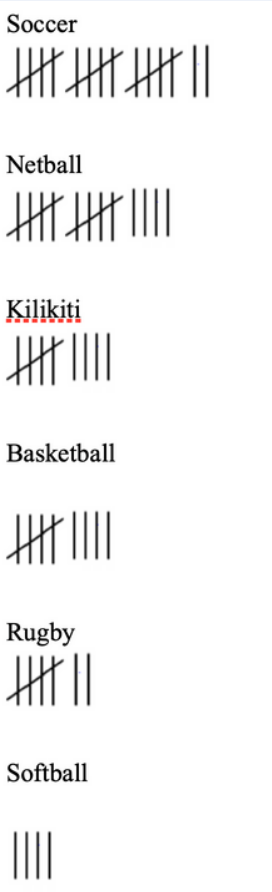
Use additive thinking with whole numbers.

Mathematical Language

Statistics, data, organise, display, sort, classify, represent, table, most, least, same, picture graphs.

Independent Tasks

The chart below shows the sports that students in Room Two play.



Draw two representations that show the sports that student in Room Two play?

What statements can you make about the sports that students in Room Two play?

Anticipations

Solutions, Misconceptions

Task 5

What questions could you ask about helping around the home?

How will you collect your data?

Develop at least two representations that show clearly the data you have collected.

What statements can you make about the data?

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 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, provide students with a set of objects to sort (types of toys, different coloured blocks, shapes).

Shareback

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.

Big Ideas

Quantity is an attribute of a set of objects and we use numbers (represented by words and symbols) to name specific quantities.

A quantity (whole) can be decomposed into different parts, the parts can be composed to form the whole.

Curriculum Links

Problem: pose a summary investigative question about a group for which the data will have categorical variables (e.g., colour, brand), and anticipate what the data might show

Plan: plan survey and data-collection questions for collecting data, identify who and what the data will measure, and discuss how the data-gathering process might affect people

Data: collect categorical data for one variable

Analysis: create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, giving the frequency for each category

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 representations clear and easy to read?

Suggested Learning Outcomes

Collect data to answer a question.

Record, sort, count, and display the data collected.

Use tally-marks or a table of data to record data.

Use picture graphs, grid paper graphs and column graphs to represent data.

Use groupings of five to add numbers.

Count in different ways.

Use grouping to solve addition problems without counting every object.

Use additive thinking with whole numbers.

Independent Tasks

Record the different sets on the table using tally marks and numbers.

Types of objects	Tally	Number

Make a representation to show the data as clearly as possible.

Mathematical Language

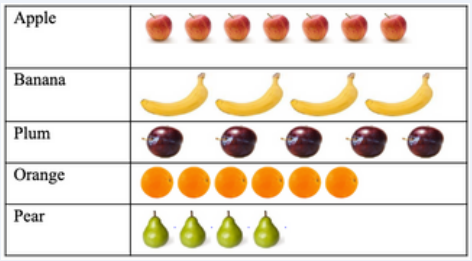
Statistics, data, organise, display, sort, classify, represent, table, most, least, tally-marks, picture graphs, column graphs.

Anticipations

Solutions, Misconceptions

Task 6

Martha was planning a healthy dessert and asked her family what their favourite fruits were in fruit salad. She made a pictograph to represent the responses.



Ria looked at the pictograph and said that it shows that plum and banana are the favourite fruits for a fruit salad because the column showing these is the longest.

Do you agree or disagree with Ria's statement?

What advice would you give to Martha to help her make her representation clearer?

Can you make a representation of what Martha found out that clearly shows her family's favourite fruit for a fruit salad?

Make statements about what Martha found out.

Teacher Notes

Have grid paper or post it notes available for the students to construct their representations.

The first focus of this task is for students to notice that using a uniform simple symbol, similar spacing and alignment, and labels for items and numbers makes the graph easier to read.

For the second part of the task, position students to make statements. If needed, model a statement for the students or use questioning to support them to develop a statement. 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.

For the independent task, use the photos or have a collection of animals or soft toys for the students to sort.

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

Analysis: create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, giving the frequency for each category

Statistical Literacy: match statements made by others with features in simple data visualisations, and agree or disagree with the statements.

Shareback

Select students to share who identify the features that make graphs clear and easy to read.

This should include using a symbol that is the same size and easy to construct, aligning the symbol and using similar spacing, using labels and numbers on the graph.

Connect

Make a column graph of the data using the grid paper.
Ask students to do this from memory.

Suggested Learning Outcomes

Describe the features of a pictograph or bar graph that make it clear and easy to read.

Use picture graphs and grid paper graphs to represent data.

Make statements about data that has been collected to answer a question.

Count in different ways.

Use grouping to solve addition problems without counting every object.

Use additive thinking with whole numbers.

Independent Tasks

What do you notice about Imani's collection of soft toys?

Can you show her collection using at least two different representations?

Make statements about Imani's soft toy collection.

Mathematical Language

Statistics, data, organise, display, sort, classify, represent, table, most, least, same, picture graphs, bar graph, column graph.

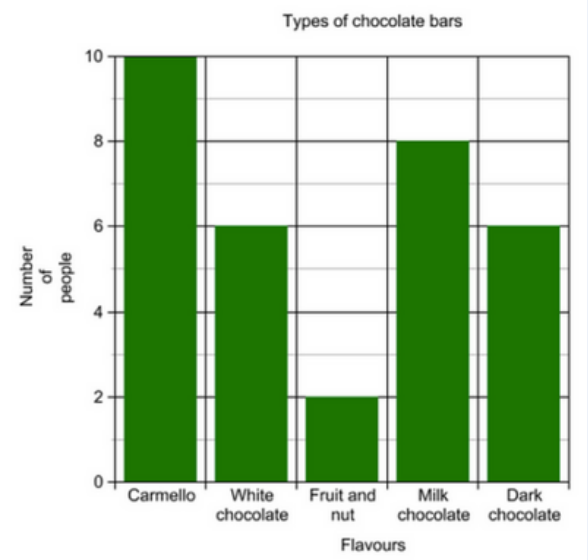
Anticipations

Solutions, Misconceptions

Task 7

Central Soccer team is running a fundraiser to go to a tournament. They will be selling chocolate bars and need to know the most popular flavours to order.

They did a survey of their team and family and found these results.



Make statements using 'I notice' about the data showing favourite chocolate bar flavours.

Make statements using 'I wonder' about the data showing favourite chocolate bar flavours.

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.

Shareback

Select students to share who are able to provide justification and evidence for the statements that they make.

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.

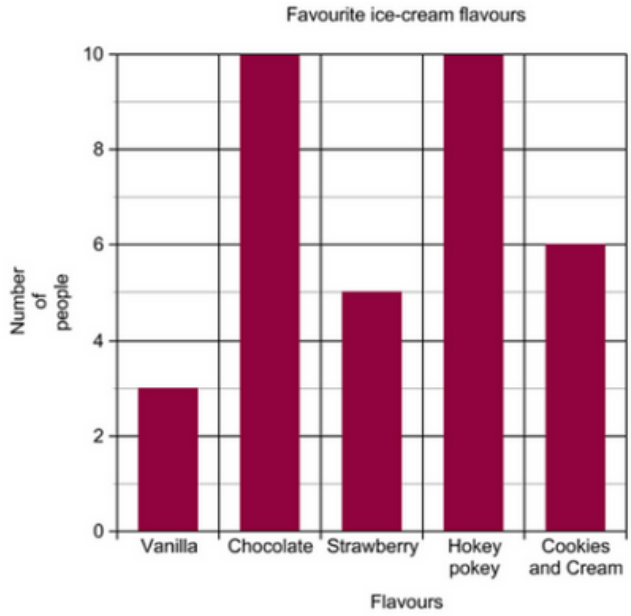
Patterns can be noticed, described, and analysed in sets of data and by using data visualisations.

Curriculum Links

Conclusion: choose from given options the statements that best answer the investigative question

Connect

Look at the graph showing
favourite ice-cream flavours.



Here are some statements about the data.
Do you agree or disagree with the statement?
Make sure you explain why.

1. The same number of people like strawberry and cookies and cream.
2. Chocolate and hokey pokey are the most popular
3. Lots of people like vanilla.
4. Three more people choose cookies and cream than vanilla.

Suggested Learning Outcomes

Make a statement about data displayed on a graph.

Agree or disagree with statements about data displayed on a graph.

Count in different ways.

Use grouping to solve addition problems without counting every object.

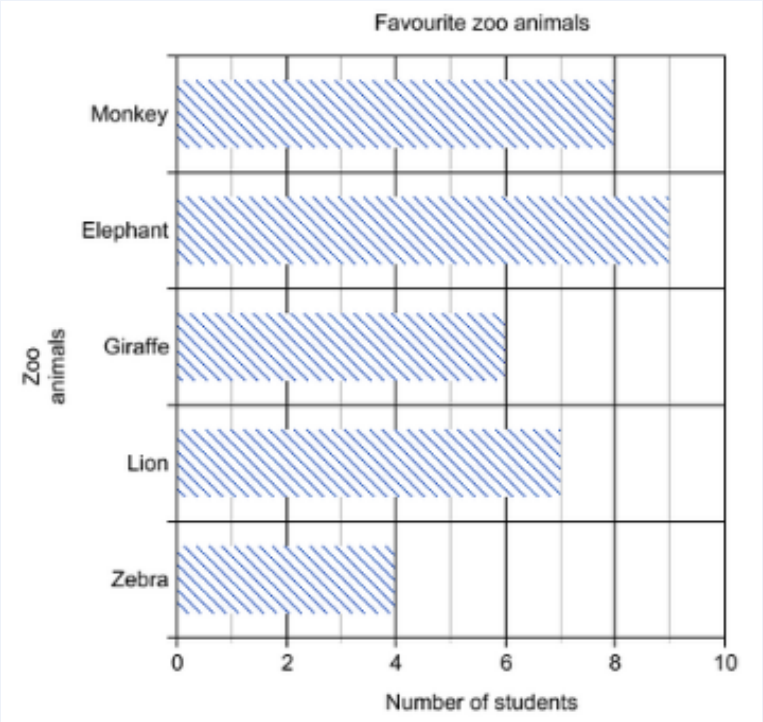
Use additive thinking with whole numbers.

Mathematical Language

Statistics, data, most, least, same, more, less.

Independent Tasks

These are the favourite zoo animals of one class of children:



Make “I notice” and “I wonder” statements about the data about pets.

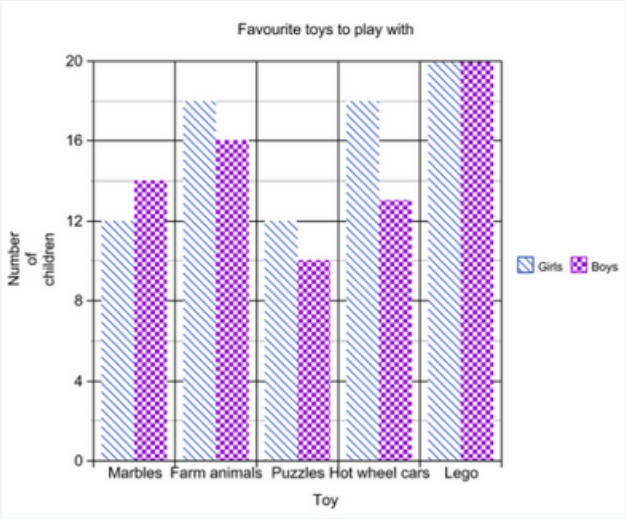
Check the statements that a classmate has made and see whether you agree or disagree and give a reason why.

Anticipations

Solutions, Misconceptions

Task 8

The Toy Library wants to order some more toys for children to borrow. They took a survey to find out about the favourite toys for girls and boys. This is what they found out:



Make statements using 'I notice' about the data showing favourite toys.

Make statements using 'I wonder' about the data showing favourite toys.

What would you tell the Toy Library to buy?

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.

Shareback

Select students to share who are able to provide justification and evidence for the statements that they make.

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.

Curriculum Links

Conclusion: choose from given options the statements that best answer the investigative question

Statistical Literacy: match statements made by others with features in simple data visualisations, and agree or disagree with the statements.

Connect

Here are some statements about the data. Do you agree or disagree with the statement? Make sure you explain why.

1. Boys like hot-wheel cars more than girls.
2. Lego is the most popular.
3. Two more girls like puzzles than boys.
4. Marbles are the least popular toy.

Suggested Learning Outcomes

Make a statement about data displayed on a graph.

Agree or disagree with statements about data displayed on a graph.

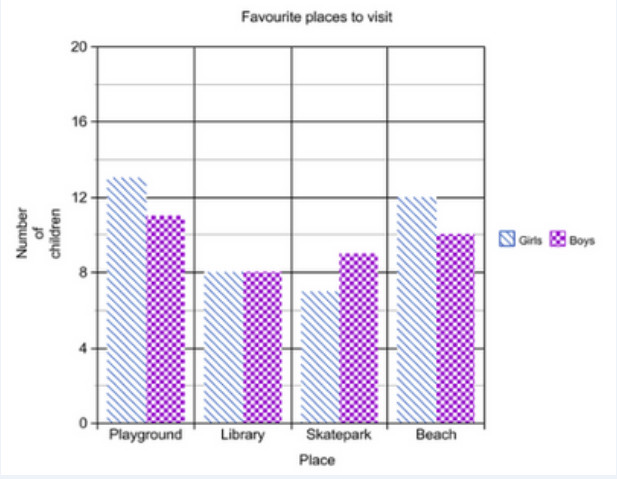
Count in different ways.

Use grouping to solve addition problems without counting every object.

Use additive thinking with whole numbers.

Independent Tasks

These are the favourite places to visit of one class of children:



Make "I notice" and "I wonder" statements about the data about favourite places to visit.

Check the statements that a classmate has made and see whether you agree or disagree and give a reason why.

Mathematical Language

Statistics, data, most, least, same, more, less.

Anticipations

Solutions, Misconceptions

Task 9

Natalia is planning her birthday party and she would like to know what food to give her guests.

Group the data cards so you can see what are the most popular to least popular types of food.

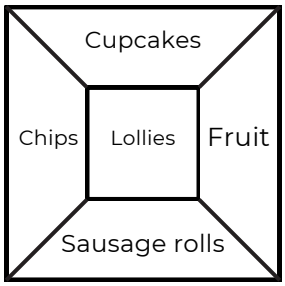
Make at least two different representations to show what you have found out.

What statements can you make about the data?

What food should Natalia buy and prepare?

Teacher Notes

Before using this task, ask students to complete a data card with different types of food on it and tick their favourite type of party food on a card. For example:



Make copies of the responses so that all students have a set of data cards to work with.

Notice students who can group the data cards in a systematic way and re-represent this using tally-marks or a table of data.

Expect students to develop at least two representations with at least one graph.

Have grid paper available and post-it notes available for students to develop graphs. Facilitate students to use a uniform simple symbol with similar spacing and alignment.

For the independent task, use the picture or grid paper graphs created for previous tasks.

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

Data: collect categorical data for one variable

Analysis: create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, giving the frequency for each category

Shareback

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

Share statements that students have made about the data and ask the rest of the class to agree or disagree with a reason.

Suggested Learning Outcomes

Record, sort, count, and display the data collected.

Use tally-marks to represent data.

Use groupings of five to add numbers.

Use picture graphs to represent data.

Use grid paper to represent data.

Make statements about data that has been collected to answer a question.

Count in different ways.

Use grouping to solve addition problems without counting every object.

Use additive thinking with whole numbers.

Independent Tasks

Make “I notice” and “I wonder” statements about the data on the graphs about party food that we made.

Check the statements that a classmate has made and see whether you agree or disagree and give a reason why.

Mathematical Language

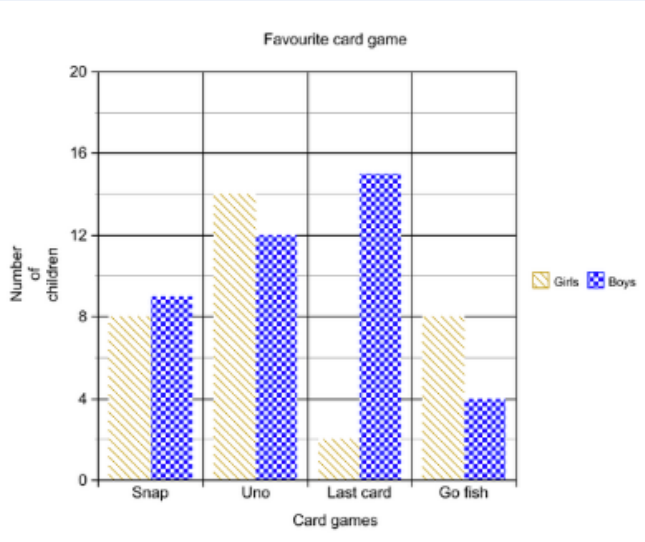
Statistics, data, organise, display, sort, classify, represent, table, most, least, same, picture graphs.

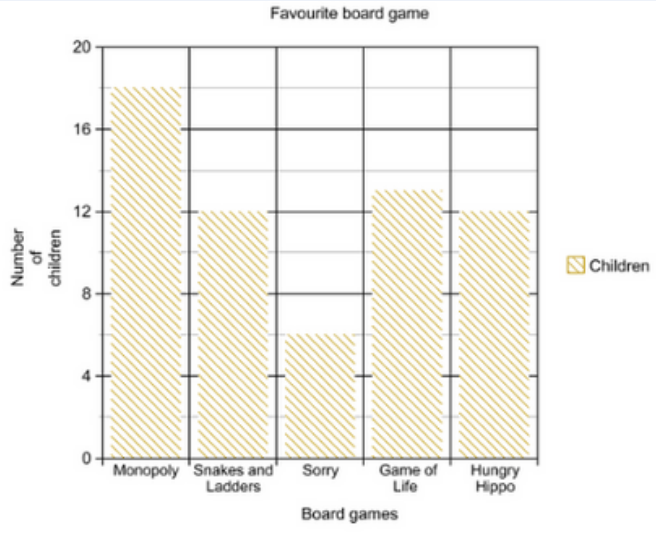
Anticipations

Solutions, Misconceptions

Task 10

Look at the graphs below and match the statements with the graphs.





Use the data from the graphs to explain which statements you agree with and why.

The same number of children like Go Fish.

Lots of boys like Last Card.

Children like Game of Life.

More girls like Uno than boys.

The same number of children like Snakes and Ladders and Sorry

Three more children like Monopoly than Snakes and Ladders.

Last Card is the most popular card game.

Sorry is the least popular board game

Uno is a good card game to buy for children.

Two less children like Hungry Hippo than Game of Life

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.

Curriculum Links

Conclusion: choose from given options the statements that best answer the investigative question

Statistical Literacy: match statements made by others with features in simple data visualisations, and agree or disagree with the statements.

Teacher Notes

Before the lesson, cut the statements up so that students can match them to the graph.

Facilitate students to use the data from the graph to explain why they agree or disagree with the statements.

Notice students who provide reasons for their statements.

Shareback

Select students to share who are able to provide justification and evidence for the statements that they make.

Connect

Look at the statements that you disagreed with. Can you change the statements, so they are true?

Suggested Learning Outcomes

Make a statement about data displayed on a graph.

Agree or disagree with statements about data displayed on a graph.

Count in different ways.

Use grouping to solve addition problems without counting every object.

Use additive thinking with whole numbers.

Independent Tasks

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

Task 1: Graph of books read.

Task 2: Graph of Pets at Home

Task 3: Desserts sold from a food truck.

Task 4: Fruit

Mathematical Language

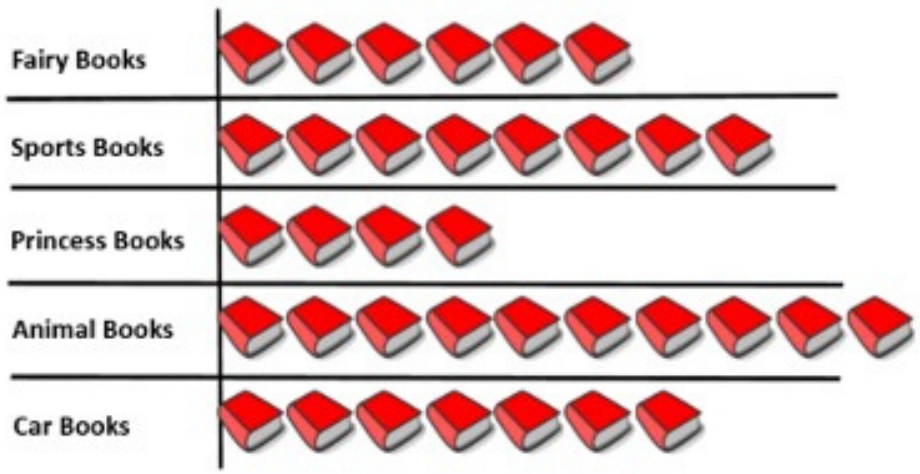
Statistics, data, most, least, same, more, less, popular.

Anticipations

Solutions, Misconceptions

Assessment Task 1 - Statistics - Year 2

This graph shows how many books some children have read.



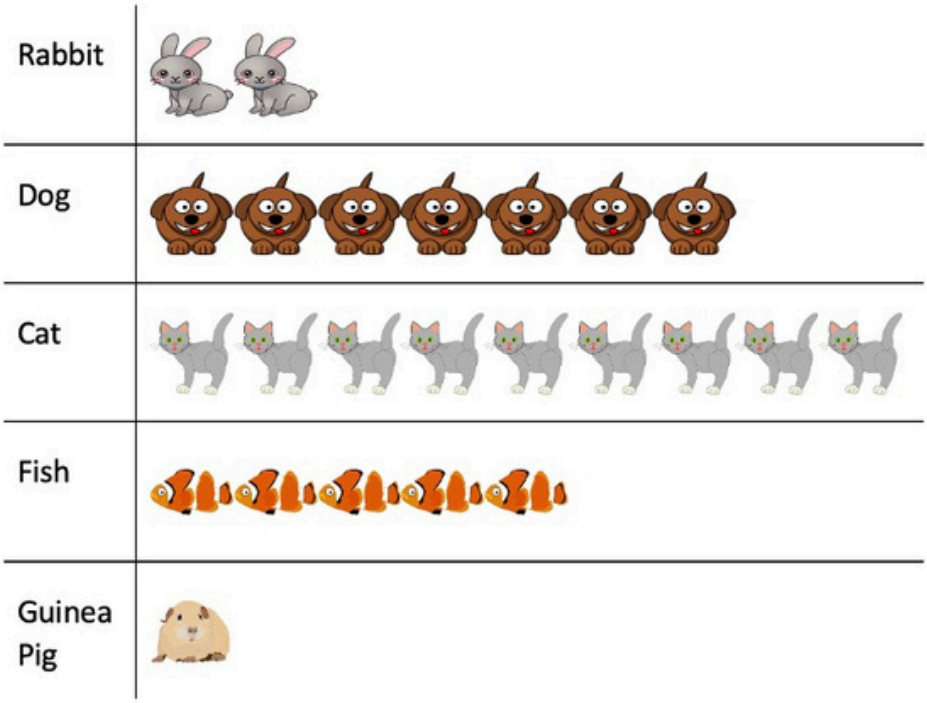
What questions can you ask about the graph?

Can you represent the data differently?

Make statements about what you notice about the books they have read based on the data in the graph.

Assessment Task 2 - Statistics - Year 2

Pets Children Have At Home



What statements can you make about this graph? What do you notice?

What questions can you ask about the graph?

How can you represent this data in a different type of graph?

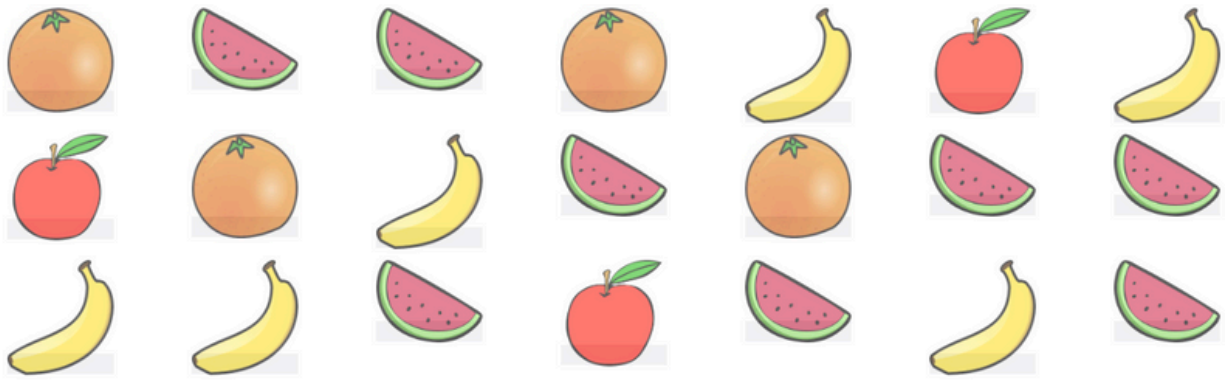
Assessment Task 3 - Statistics - Year 2

These are the desserts (ice-cream cone, shaved ice, sundae, fruit salad) that were sold from a food truck. What questions could you ask about this?

Can you display what desserts they sold?

What statements can you make about the desserts that were sold?

Assessment Task 4 - Statistics - Year 2



Here are the fruits the tamariki chose from the kai basket for morning tea.

What questions could you ask about this?

Make a display to show how many of each fruit were chosen.

What statements can you make about the data?