

A close-up photograph of several green fern fronds, showing the intricate, feathery structure of the leaves. The fronds are vibrant green and appear to have small droplets of water on their surfaces. The background is dark and out of focus, highlighting the texture of the ferns.

RICH MATHEMATICAL TASK BOOKLET

STATISTICS

YEAR 0

Teacher Booklet

Task 1 (Whole class activity)

Sort the shapes into sets that are similar.

What sets have you made?

What is the same?

What is different?

How many is in each set?

Re-sort the shapes into different sets.

What sets have you made?

What is the same?

What is different?

How many is in each set?

Teacher Notes

Before you launch the task, show students a set of objects and ask them to come up with different ways that they could be sorted.

During the launch, allow the students to sort the shape blocks into sets by an attribute which they have chosen themselves (e.g., colour, size, shape).

Have sets of pattern blocks available for the students to sort into sets including different colours, shapes, and sizes.

Notice the initial way that students sort and group the pattern blocks and ask them to think about what is the same about the shape blocks in the set and what is different to help them identify the attribute. Use the prompts 'what is the same?' 'what is different' when needed.

Expect students to use the language of classification in their descriptions of the sets.

For the independent activity, provide students with sets of objects (e.g., balls, blocks, or toys).

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

Collecting categorical data for an investigative question with limited categories (e.g. Do students in our class have one foot longer than the other?)

Shareback

Select students to share who have been able to identify an attribute to sort the shapes (e.g., colour, size, sides, etc) and can describe what is the same and different.

Ask students to share how they grouped and counted the number in each set.

Support students to notice how the responses can be grouped and how the number in each category can be found.

Connect

Choose some of the attributes that the students have identified to sort the shape blocks.

Ask students to sort their set using the attribute and then arrange the shape blocks into lines to easily show which has the most (similar to a graph along a baseline).

Suggested Learning Outcomes

Sort objects into different sets by an attribute.

Describe similar and different attributes.

Display category data using different representations.

Independent Tasks

Sort the objects into sets that are similar.

What sets have you made?

What is the same?

What is different?

How many is in each set?

Re-sort the objects into different sets.

What sets have you made?

What is the same?

What is different?

How many is in each set?

Mathematical Language

Similar, dissimilar, alike, same, different, attribute, organise, sort, classify, belong together, group, represent.

Anticipations

Solutions, Misconceptions

Task 2

How can we sort these objects by attributes?
How many objects are in each sorted group?
Which has more?
Record the results.

Re-sort the objects using different attributes.
How many objects are in each sorted group?
Which has more?
Record the results.

Teacher Notes

Before you launch the task, play 'Guess my rule'. Have a set of objects and begin sorting them into two different sets according to an attribute. Ask the students to guess the rule for how they are being sorted.

Have sets of objects available for the students to sort into sets (e.g., teddies, play food, cars, shape blocks, buttons, beads, etc).

Notice the initial way that students sort and group the objects and ask them to think about what is the same about the objects and what is different to help them identify the attribute.

Use the prompts 'what is the same?' 'what is different' when needed.

Expect students to use the language of classification in their descriptions of the sets.

For the independent activity, provide students with sets of objects as below (e.g., beans, play-food, blocks) or modify the prompts according to the classroom resources available.

Shareback

Select students to share who have been able to identify an attribute to sort objects (e.g., colour, size, length, use) and can identify the attribute that they used to sort the objects.

Support students to notice how the responses can be grouped and how the number in each category can be found.

Ask students to share how they grouped and counted the number in each set.

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

Collecting categorical data for an investigative question with limited categories (e.g. Do students in our class have one foot longer than the other?)

Recording data using tally charts

Creating picture graphs for categorical data

Connect

Ask the students to sort their sets into sub-categories using a new attribute (e.g., sort the red teddies into small red teddies and large red teddies) and count how much is in the new set.

Ask the students to represent the sets.

Suggested Learning Outcomes

Sort objects into different sets by an attribute.

Describe similar and different attributes.

Display category data using different representations.

Independent Tasks

Put all the blue beans in one set.
Put all the red beans in another set.
Put all the yellow beans in another set.
How many beans are in each set?
Record the results.

Put all the rectangular blocks in one set.
Put all the round blocks in another set.
How many blocks are in each set?
Record the results.

Put all the dinner food in one set.
Put all the snack food in another set.
Put all the dessert food in another set.
How much food is in each set?
Record the results.

Now choose different attributes to sort the objects.
What sets have you made?

Mathematical Language

Similar, dissimilar, alike, same, different, belong together, group, attribute, organise, sort, classify, represent.

Anticipations

Solutions, Misconceptions

Task 3

Oh dear, Hannah bought some of her collections to school and now they have got all mixed up!

Help Hannah to sort out the different collections for the objects.

What different ways could Hannah sort the collections?

Represent the results.

Teacher Notes

Before you launch the task, during literacy time, either read “Hannah’s collections” by Marthe Jocelyn or show the students the story being read: <https://www.youtube.com/watch?v=1IBBsRaqeHo>.

While you read the book, stop and discuss with the students the different ways that Hannah had sorted her collections.

To launch the task, ask the students to share the different collections that they have at home, then show the students the objects and ask them to brain-storm the different ways that the objects could be put into collections.

Have mixed sets of objects representing Hannah’s collections available for the students to sort into sets (e.g., buttons, ice-block sticks, shells, feathers, leaves, soft toys or puppets) and multi-link cubes for the connect.

Notice the initial attributes that students use to sort and group the objects. Expect them to have more than two sets or collections when sorting the objects.

Expect students to use the language of classification in their descriptions of the sets.

Shareback

Select students to share who have been able to identify an attribute to sort objects (e.g., use, type, material, shape) and can identify the attribute that they used to sort the objects.

Ask students to share how they grouped and counted the number in each set.

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. Ask them to consider what you would do with objects that fit into more than one collection.

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

Collecting categorical data for an investigative question with limited categories (e.g. Do students in our class have one foot longer than the other?)

Recording data using tally charts

Creating picture graphs for categorical data

Connect

Ask the students represent how many objects were in each set for the collections that they made using multi-link cubes on a baseline (replicating a graph).

Suggested Learning Outcomes

Sort objects into different sets by an attribute.

Describe similar and different attributes.

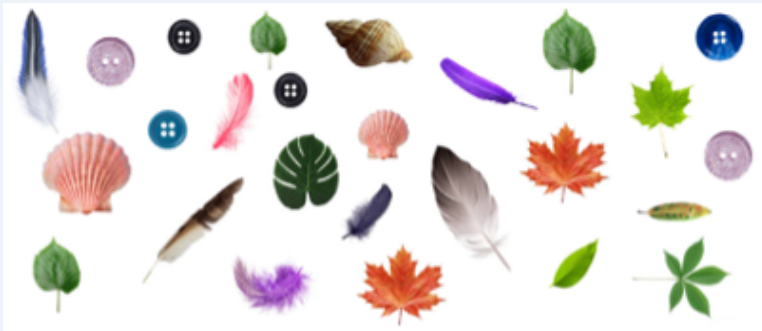
Display category data using different representations.

Mathematical Language

Similar, dissimilar, alike, same, different, belong together, group, attribute, organise, sort, classify, represent.

Independent Tasks

Oh dear, Hannah bought some of her collections to school and now they have got all mixed up!



Help Hannah to sort out the different collections for the objects.

What different ways could Hannah sort the collections?

Represent the results using the multi-link cubes.

Anticipations

Solutions, Misconceptions

Task 4

These are the types of shoes that one class of children wore to school.

What ways can you sort the shoes?

Represent what you have found.



Teacher Notes

Expect students to use the language of classification in their descriptions of the sets of pairs of shoes.

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 who have used different forms of structured grouping.

Record their representations and the number symbol. Ask the students to practice copying the different groupings and record the matching number symbol

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.

Connect

How can the total number of pairs of shoes be found from the recordings?

Ask students to find the total number of pairs of shoes from their own recording and from the table and check these are the same.

Model how the pictures of shoes could be used to represent a picture graph.

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. Outcomes can have different likelihoods, and these can vary.

Curriculum Links

Collecting categorical data for an investigative question

Recording data using tally charts

Creating picture graphs for categorical data

Describing a picture graph by giving the frequency for each category

Suggested Learning Outcomes

- Record, sort, count, and display the data collected.
- Communicate the results of the investigation.
- Using grouping strategies to count and sort.

Mathematical Language

Statistics, data, organise, display, sort, classify, represent, table, most, least, similar, dissimilar, alike, same, different, belong together, group, attribute.

Independent Tasks

Nifo wanted to see how many children had a cat or a dog as a pet. This is what he found out:



Complete the table.

Cats	
Dogs	

Draw a representation to show this data.

Anticipations

Solutions, Misconceptions

Task 5

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

Sort the food into different sets and record the results.

Represent the results in different ways.

Teacher Notes

Expect students to use the language of classification in their descriptions of the types of food for morning tea.

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 tables of data.

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.

Connect

How are your representations the same?

How are your representations different?

Which ones most clearly show the number of children with each type of food for morning tea?

What statements can you make about morning tea for students in this class?

Big Ideas

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

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

Curriculum Links

Collecting categorical data for an investigative question

Recording data using tally charts

Creating picture graphs for categorical data

Describing a picture graph by giving the frequency for each category

Suggested Learning Outcomes

- Collect, sort, and count data.
- Display category data using different representations.
- Using grouping strategies to count and sort.

Mathematical Language

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

Independent Tasks

This is the favourite fruit of children in Room 1.



How many children have each fruit as their favourite?
Represent what you have found using two different recordings.

Anticipations

Solutions, Misconceptions

Task 6

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 make 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 graph that was modelled during the connect. Ask them to discuss what helps to make the picture graph clear and easy to see.

Challenge them to develop a picture graph to represent the sets and categories of food that they recorded in the previous lesson.

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.

Shareback

Select students to share who have used the same symbol or icon to represent all of one type of food and a different one for all the other food, etc and a student whose picture shows the greatest amount without having to count or read the number.

If no students have developed a representation that shows this, model how it could be recorded.

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.

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

Creating picture graphs for categorical data

Describing a picture graph by giving the frequency for each category

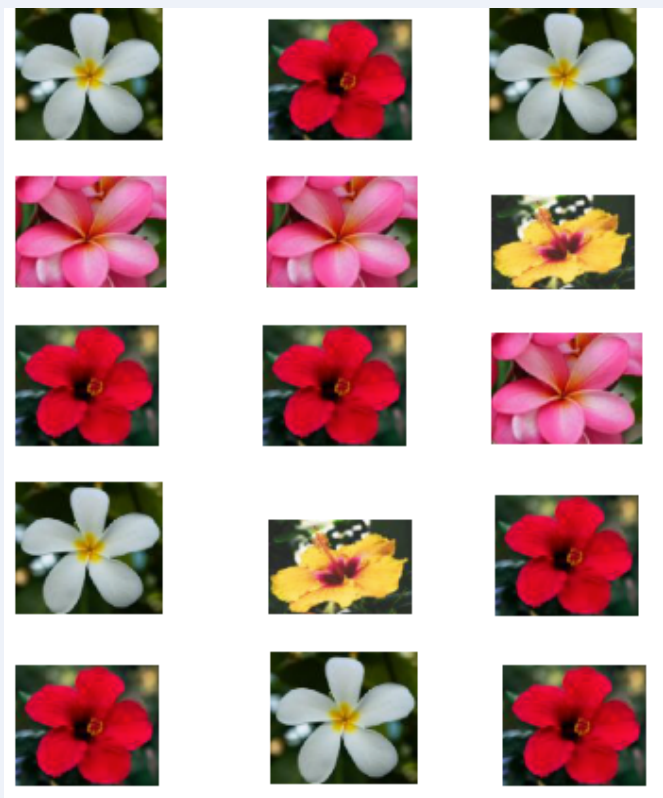
Answering questions about a picture graph, including which category has the most or least items

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.
- Use groupings of five to add numbers.
- Count in groups.

Independent Tasks

Oliana is finding out which tiare members of her dance group like for their ‘ei katu. These are the colours they have chosen:



- How many children have each flower as their favourite?
- Represent what you have found using two different recordings.

Mathematical Language

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

Anticipations

Solutions, Misconceptions

Task 7

In our classroom, how many students have the same favourite activity on the playground?

Represent what you have found.

Teacher Notes

Change the context of the task to a topic that is of interest to your class (this could be linked to your inquiry topic). For example, this could be favourite playground equipment, games, pets, breakfast food.

Begin with your whole class by asking the students a question about the topic (e.g., What is your favourite activity at the playground?) that will generate category data and find out the 3 – 4 most common categories by taking a count.

Each student then shows which category (of the 3 - 4) relates to them by representing their response (picture, word, letters) on a large sheet of paper or the whiteboard.

Launch the task by re-wording the question (e.g., How many students in this class have each activity at the playground as their favourite?).

Ask the students to draw or write something that would show everyone what they found out in response to the question.

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 playground activity, tally marks and number (support students to count in fives).

Type of playground activity	Tally	Number

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

Big Ideas

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

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

Curriculum Links

Collecting categorical data for an investigative question with limited categories

Recording data using tally charts

Creating picture graphs for categorical data

Describing a picture graph by giving the frequency for each category

Answering questions about a picture graph, including which category has the most or least items

Shareback

Select students to share who have used different representations and presentations but focus on students who have used a symbol or drawing that is quick to make and the clearest to read.

Connect

How are your representations the same?

How are your representations different?

Which ones most clearly show the number of children for each activity at the playground?

What statements can you make about favourite playground equipment?

Suggested Learning Outcomes

Collect data to answer a question.

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

Use tally-marks and picture graphs to represent data.

Use groupings of five to add numbers.

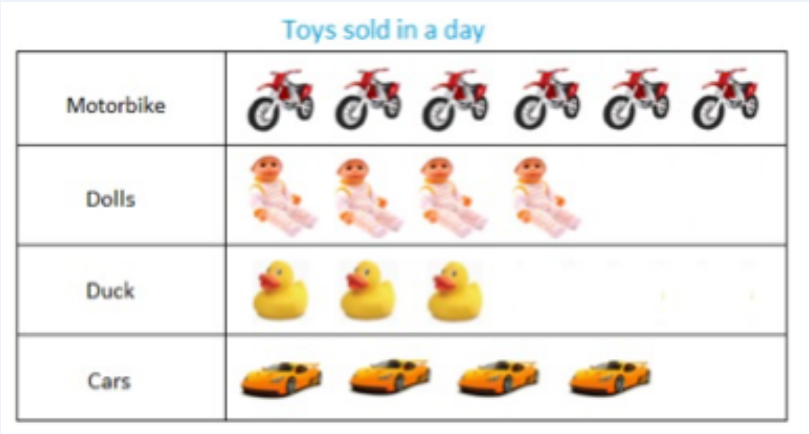
Using grouping strategies to count and sort.

Mathematical Language

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

Independent Tasks

The chart below shows how many different toys were sold from 2Cheap in one day.



Record the data on the table:

Type of toy	Tally	Number
Motorbike		
Doll		
Duck		
Car		

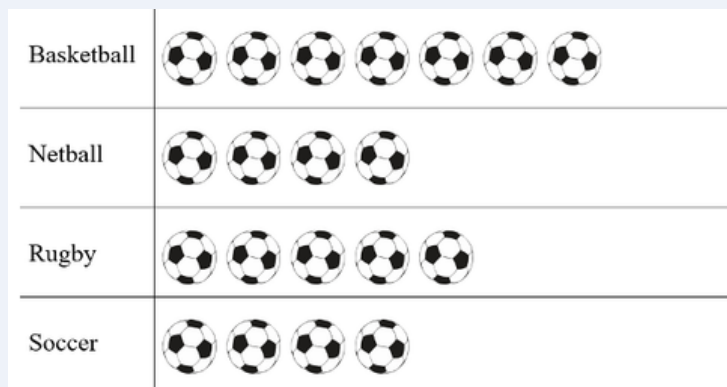
Make a picture graph of the data.
What statements can you make about the data?

Anticipations

Solutions, Misconceptions

Task 8

This graph shows how many children play different ball sports:



Make statements using 'I notice' about the data showing how many children play the different ball sports.

Make statements using 'I wonder' about the data showing how many children play the different ball sports.

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.

Connect

List the 'I wonder' questions developed by the students and lead a discussion as to whether the 'I wonder' questions could be answered from the graph or what data would need to be collected to answer them.

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

Creating picture graphs for categorical data

Describing a picture graph by giving the frequency for each category

Answering questions about a picture graph, including which category has the most or least items

Data visualisations are representations that help reveal the story of a set of data.

Suggested Learning Outcomes

- Make a statement about data displayed on a graph.
- Ask questions about data displayed on a graph.
- Compare sets and the size of numbers to make statements.

Mathematical Language

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

Independent Tasks

This graph shows the after-school activities during the week of a class of children:

Activity Club	Number of Children
Sports Club	
Drama	
Skidz	
Dance	

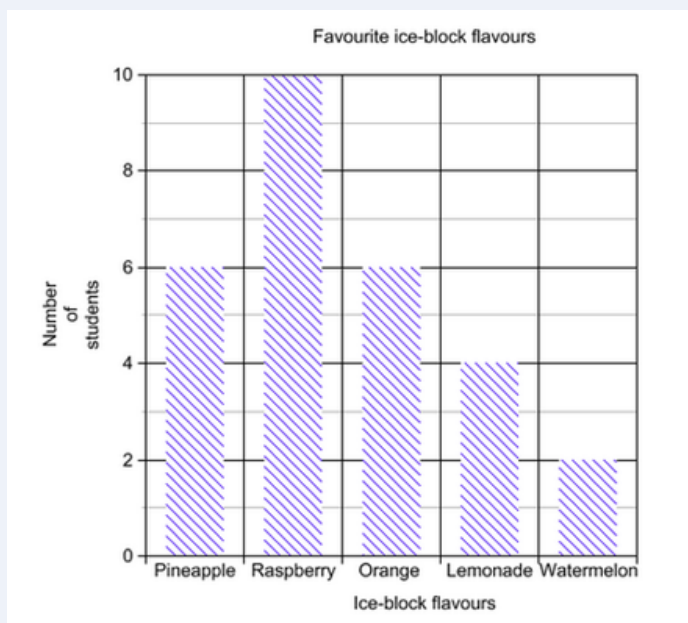
- Make statements using ‘I notice’ about the data showing how many children do different after-school activities.
- Make statements using ‘I wonder’ about the data showing how many children do different after-school activities.

Anticipations

Solutions, Misconceptions

Task 9

Central Soccer Club wants to buy ice blocks for the players for an end of season treat. They have taken a survey of two teams to find out their favourite flavours.



Make statements using 'I notice' about the data showing favourite ice-block flavours.

Make statements using 'I wonder' about the data showing favourite ice-block 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

Describing a picture graph by giving the frequency for each category

Answering questions about a picture graph, including which category has the most or least items

Data visualisations are representations that help reveal the story of a set of data.

Connect

Do you agree or disagree with these statements:

- 1) Lots of people like pineapple ice-blocks.
- 2) Raspberry ice-blocks are the flavour most people like.
- 3) Most boys like raspberry ice-blocks.
- 4) Not many people like watermelon ice-blocks.
- 5) Two more people like orange ice-blocks than lemonade ice-blocks.

Suggested Learning Outcomes

Make a statement about data displayed on a graph.

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

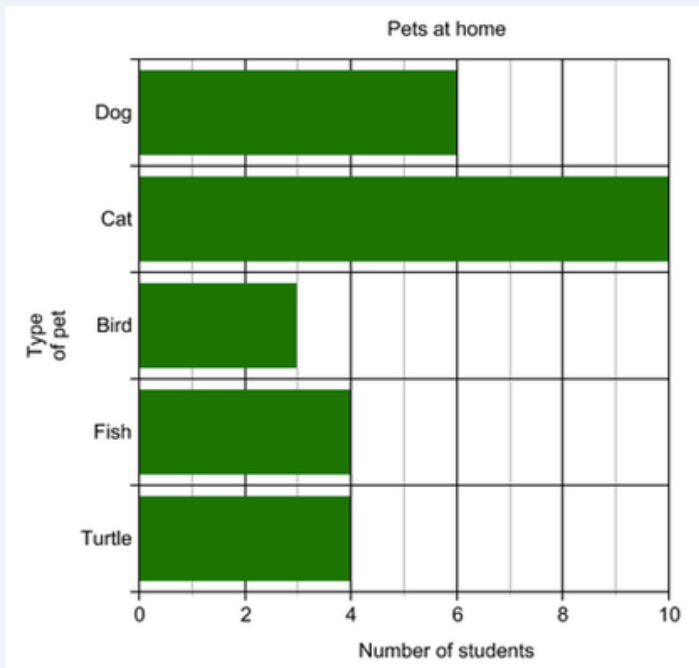
Compare sets and the size of numbers to make statements.

Mathematical Language

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

Independent Tasks

These are the pets that one class of children have at home:



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

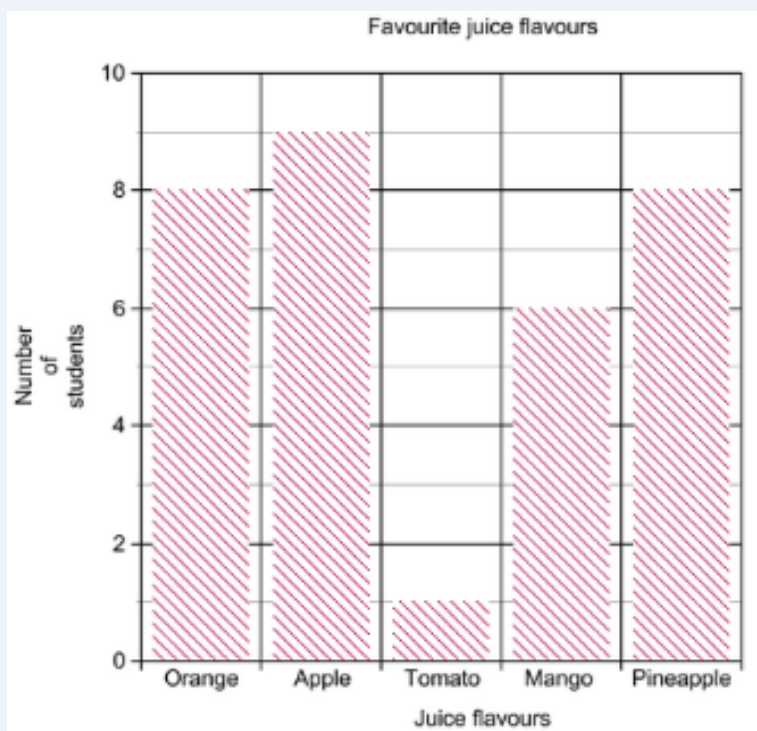
Check the statements that a classmate has made and see whether you agree or disagree and give a reason why.

Anticipations

Solutions, Misconceptions

Task 10

Look at the graph showing favourite juice flavours.



Write a set of 'I notice' and 'I wonder' statements.
What statements can you make from the graph?

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

Describing a picture graph by giving the frequency for each category

Answering questions about a picture graph, including which category has the most or least items

Data visualisations are representations that help reveal the story of a set of data.

Connect

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

1. Apple juice is the most popular.
2. The same number of people like mango juice and pineapple juice.
3. Lots of people like tomato juice.
4. One more person chose apple juice than orange juice.

Suggested Learning Outcomes

Make a statement about data displayed on a graph.

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

Compare sets and the size of numbers to make statements.

Independent Tasks

Select one of 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

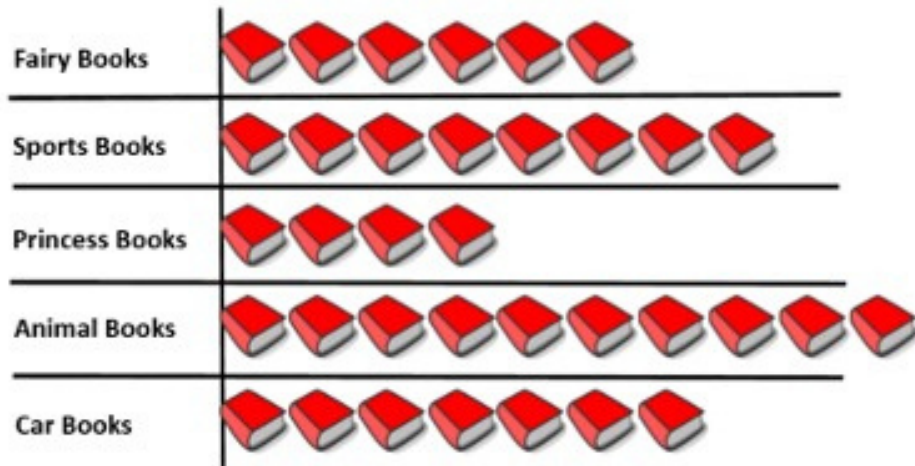
Statistics, data, most, least, same, more, less.

Anticipations

Solutions, Misconceptions

Assessment Task 1 - Statistics - Year 0

This graph shows how many books some children have read.



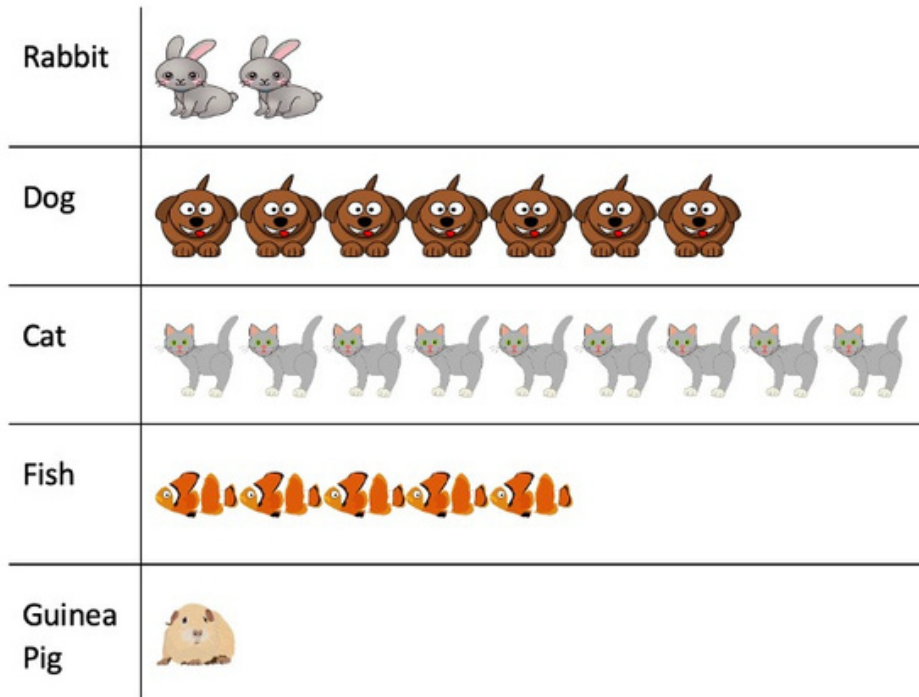
What questions can you ask about the graph?

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 0

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 0

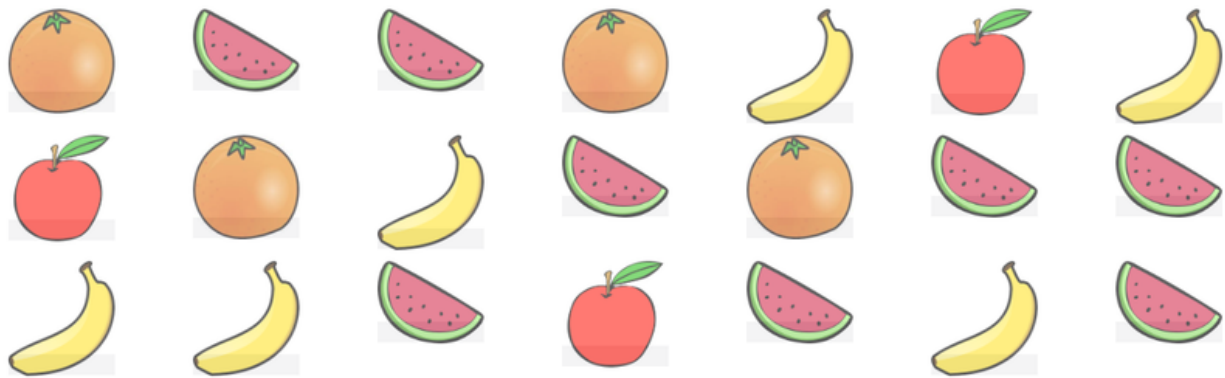


These are the desserts (ice-cream cone, shaved ice, sundae, fruit salad) that were sold from a food truck. What questions could you ask about this?

Can you display what desserts they sold?

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

Assessment Task 4 - Statistics - Year 0



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?