

# Feet First term 1: walking and road safety

Updated 2023



Key understanding: Walking benefits people, places and our planet.

Driving question: Walking – what difference can I make?

- Define walking.
- Explain the benefits of walking.
- Predict how using sustainable transport such as walking might improve people, places and the planet.

## Activity 1.3 Mathematics: statistical investigation on road safety

Achievement objectives – see New Zealand Curriculum Mathematics and Statistics levels 1-4 statistical investigation and statistical literacy.

### Example learning intentions

Define 'statistical investigation'.

Gather relevant data.

Sort and count information using a range of methods.

Graph relevant data using a range of methods.

Analyse the data.

Interpret statements to make meaning.

Identify patterns and trends.

Justify these trends and patterns from the data collected.

Compare and contrast results.

Formulate questions that will gather relevant information.

Present in a way that will inform others.

Evaluate the effectiveness of statistical investigations by others.

## Learning experiences

*Select the learning experiences that best match the abilities of your student and that support your learning intentions.*

Share online information with students to give them a feel of what a statistical investigation is.

[Maths statistics exemplars \(TKI\)](#)

[Statistical investigations units of work \(NZMaths\)](#)

[How kids learn: the statistical enquiry cycle \(CensusAtSchool\)](#)

Define 'statistical investigation' with the students and record their responses.

Discuss reasons for collecting information.

Start a class 'glossary' collecting statistical vocabulary as you proceed through the process. List all of the different ideas that you could gather data on from the students in the class.

Use a tally chart to record some classroom data (birthdays, types of pets, types of cars, main thing in their lunchbox).

Describe different ways to plot information and demonstrate findings (pictogram, histogram, bar, pie, circle graphs etc).

Model each graph separately with the class and then get students to record their data.

Compare and contrast the different ways of recording data.

Identify a trend or a pattern and explain what some of the causes might be.

Select a questioning framework (5 Ws) and model the types of questions you might ask if you were gathering information from other teachers about the types of cars that they drove. Determine what a relevant and a not relevant question would be.

Create a question board (digital or non-digital) with the student questions that they have used as part of their inquiry.

Sequence the process of a statistical investigation. Sequence a possible time frame for this.

Get students to reflect on what graph they liked best and why.

Create your own statistical investigation (in pairs or groups) around a road safety issue that has relevance in your community. You will need to follow the process that you have already created.

Possible contexts:

- parents dropping students off too close to children zones
- pedestrian crossings, kea crossings
- road signs not visible, lack of signage
- accident-prone sites
- walking, scootering and cycle safety awareness
- speed spots
- parking
- road safety resources.

Summarise the findings from your investigation.

Share your investigation with at least 2 other people before you present it.

Reflect on the method you chose and justify why this was the best.

Using your data and new findings, select who would be the best audience to present this to, so that you could use your investigation to persuade someone to change behaviours.

## Assessment

### Representing and interpreting data

|  |   |
|--|---|
|  | I can reflect on findings and make a generalised statement or justification about an investigation.                           |
|  | I can formulate relevant questions to gather information and can compare data between graphs and explain trends and patterns. |
|  | I can use a range of simple graphs to show information and can interpret data.  |
|  | I can use a tally chart to record information.  |
|  | I need help to use tally charts or simple graphs.   |

### Key competency: Thinking

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|--|--|
|  | I can reflect on questions and can continually modify questions to improve the data being collated.                        |
|  | I can explain the reasons why certain questions are being asked and can sequence the questions to improve quality of data. |
|  | I can formulate several relevant questions to gather information.  |
|  | I can formulate one relevant question to gather information.   |
|  | I need help to formulate questions to gather information.  |

## Internet resources

[Stats NZ topic: transport](#)

[Ministry of Transport – statistics and insights](#)

[Waka Kotahi open data portal](#)

[Waka Kotahi research and data](#)

## Thinking resources

The answer is 'data'. Write 5 questions that this could be the answer for.

List as many things as you can about a statistical investigation.

Sequence the steps you took to plan and implement your statistical investigation.

Construct a plus-minus-interesting chart on the statistical investigation that you did.

Create a new way of collating data.

## What if questions

*Use these questions for class or group discussions or for writing.*

What if we had no ways of recording numbers? How could we record data?

What if no one ever did statistical investigations?

What if we collected incorrect data?

What if we were not allowed to use graphs to present data?

# Activity 1.4 Mathematics: road safety and geometry of road signs

Achievement objectives – see New Zealand Curriculum Mathematics and Statistics levels 1-4 measurement, shape, position and orientation.

## Example learning intentions

### Measurement

Define 'length'. Define 'distance'.

Measure length accurately using metric units in classroom or playground setting.

Measure length accurately using metric units in playground setting.

Estimate length in classroom or playground setting.

Explain measuring in a formal way using correct terms.

Explain distance using own language.

Transfer classroom learning to an outside context.

### Shape

Identify shapes.

Describe the attributes of shapes.

Define 'closed surfaces'. Describe the attributes.

Define 'polyhedral'. Describe the attributes.

Define a 'plane'.

Define a 'cross section'.

Compare and contrast different attributes of shapes.

Classify shapes by spatial features.

Recognise shapes in another setting and justify why you recognise the shapes.

### Position and orientation

Define 'direction'. Identify and use correct language to give directions in a closed area.

Describe a different pathway accurately.

Define 'map'. Describe the attributes of a map.

Identify positions on a map.

Explain accurately a pathway from a map.

Define 'compass'. Explain what a compass does.

Compare and contrast different maps.

Create accurate instructions using a street map.

Create a map to show position and direction.

Use co-ordinates accurately to demonstrate position and direction.

## Learning experiences

*Select the learning experiences that best match the abilities of your student and that support your learning intentions.*

### Measurement

Use Google Maps to locate your local area and pin the locations where everyone lives.

Get students to plan a proposed route that the class will walk around so that students can experience measuring length and distance.

Define 'length'. Add any measuring language that the students know.

Describe all of the things they need to measure in their lives.

Get students to select items from the classroom and discuss how they could measure them?

Provide appropriate measures to measure these and record the measurements.

Brainstorm and record: if we did not have a ruler, how else could we measure these items? (Blocks, hands, feet, string).

Get students to identify objects in the playground and discuss how they could measure them.

Provide appropriate measures to measure these and record the measurements.

Get students to select items between which they could measure the distance.

Get students to estimate the distance and then measure using conventional and unconventional methods.

Compare and contrast the results, looking for similarities in measurement data.

### Shape

Get students to plan a route that the class will walk around so that students can identify different signs.

Define 'sign'. Define 'purpose of a sign'.

Use Google images to explore different signs; get children to select what you are to search, e.g. signs that they are familiar with.

Find as many different types of signs as possible and get students to classify them (students can select the categories e.g. shape, colour, warning, information etc).

Describe the times when signs are useful.

List the criteria that a warning sign should have; develop success criteria with students.

Using Maths equipment, identify shapes.

Describe the attributes of shapes. Do the same for closed surfaces, polyhedral, plane and cross-section.

Identify these shapes in the classroom setting/playground setting.

Record results on a table.

Cut up an orange; discuss the surface that you have made.

Compare and contrast different attributes of shapes.

Classify shapes by spatial features.

Recognise shapes in another setting and give reasons why you recognise them to be those shapes.

On your planned walk, photograph signs in your area and print out the pictures.

Sketch the signs that you come across. On a table, note the shape, attributes, purpose.

In groups, get students to sequence them in the order of the walk. Place in order on a storyboard.  
Get students to classify (students can select the categories, e.g. shape, colour, warning, information etc).  
Print your photos out and get students to make up a picture classification map (in pairs/groups).  
Explain why certain signs are the colour and shape that they are.

### **Position and orientation**

Get students to plan a route that the class will walk around so that students can estimate and calculate distance.

Define 'direction'.

Describe all of the different ways there are to find your way.

Develop a vocabulary list of the word specific to mapping and direction (turns, half turns, quarter turns etc).

Set up an obstacle course in the classroom and in pairs get some students to write directions. Blindfold the other students and see if they can direct the blindfolded one through the course only from the written directions.

Repeat this activity outside but draw a street system on a court area.

Get students to have several attempts at writing new sets of directions.

Define 'map'. Describe all of the attributes of a map.

Identify positions on a map.

Place positions on map.

#### [How maps work](#)

On a map of the classroom, school or local area, map a pathway and get students to match with accurate directions.

In pairs, get students to draw their own pathways and in pairs write directions for each example.

Look at the chosen walk that students have identified. Get each pair of students to write a set of directions to follow. Put into a table format so they can tick or cross if their directions are incorrect enroute.

Reflect on their directions back in class and rewrite any that were incorrect.

Define 'compass'.

#### [How compasses work](#)

Identify the points of the compass.

Define 'co-ordinates' with students.

Grid the school off on a school map and get students to write their own co-ordinates.

Get students to explore Google Street Maps and get them to write directions and leave by the computer to see if other students can follow their directions.

## Assessment

### Learning area: mathematics and statistics

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|--|--|
|  | I can make a generalisation about the attributes of all shapes.  |
|  | I can explain the attributes of shapes and explain similarities and differences between shapes. I can explain about polyhedral and flat surfaces and cross sections. |
|  | I can sort many shapes by appearance, describe them and match them. I understand planes and flat surfaces.   |
|  | I can sort one shape by appearance and can match this shape.   |
|  | I need help to sort shapes by appearance.  |

### Key competency: using language, symbols and text

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|--|--|
|  | I can put these ideas into another context by creating something new using formulae, and can make estimations using generalisations.                   |
|  | I can make connections between different units of measurement when measuring distance and explain these connections e.g. similarities and differences. |
|  | I can accurately measure distances using conventional and unconventional methods.  |
|  | I can accurately measure distances using conventional methods.   |
|  | I need help to measure distances accurately.   |



## Internet resources

[Geometry and measurement \(NZMaths\)](#)

## Thinking resources

After your walk, reverse the order of the route that you took and see if you can record the backwards route accurately.

What if we did not have traditional maps? List as many other ways as possible to find your way around a place you have never been to before.

Enlarge a walking map of the route you walk to school and place items of interest or that you know on it.

P.M.I.: We should only ever be able to move in a straight line.

Select an area of your map and modify it to be kid-friendly.

## What if questions

*Use these questions for class or group discussions or for writing.*

What if every sign that we had was exactly the same shape?

What if all signs had to be black and white?

What if we did not have maps to find our way around?

What if the circle was not invented?

What if everything we looked at was a flat plane and there was no dimension?