Understanding and using information presented in the form of graphs, tables or maps is an important part of everyday life in our community. Graphs help us learn about how prices are changing or the fortunes of political parties are fluctuating. We use tables in various guises, such as timetables, tables of postage rates and tax tables. Maps also feature regularly in our lives, as we encounter floor plans in shopping malls and public buildings, use street maps to find our way around towns and cities, or study weather maps in the hope that they may enlighten us about what clothes to wear or activities to plan. It is appropriate, therefore, that children begin to experience and understand graphs, tables and maps from an early age, learning how to extract and interpret information from them, and also how to create them.

The study or use of graphs, tables or maps is featured in several learning areas of the *New Zealand Curriculum Framework*: mathematics, science, technology, social sciences and English. The use of graphs, tables and maps is also included within both numeracy skills and information skills.

During the planning for national monitoring, a decision was taken that skills in the use of graphs, tables and maps should be brought into sharp focus by assessing and reporting on these skills separately, in one year of the four year assessment cycle.

This chapter reports the results of twenty-seven tasks relating to graphs, tables and maps, all administered to individual Māori students in both general education settings and Māori immersion settings. Of these tasks, five were administered in one-to-one interview format and sixteen in stations format (where students worked independently on a series of paper and pencil tasks, many of which included the use of hands-on materials or visual information). The last six tasks were administered in paper-and-pencil format during a team and independent session.

National monitoring results are reported task by task so that results can be understood in relation to what the students were asked to do. To allow comparisons of performance between the 1999 and 2003 assessments, however, nine of the twenty-seven tasks have been designated *link tasks*. Student performance data on these tasks are presented in this report, but the tasks are described only in general terms because they will be used again in 2003.
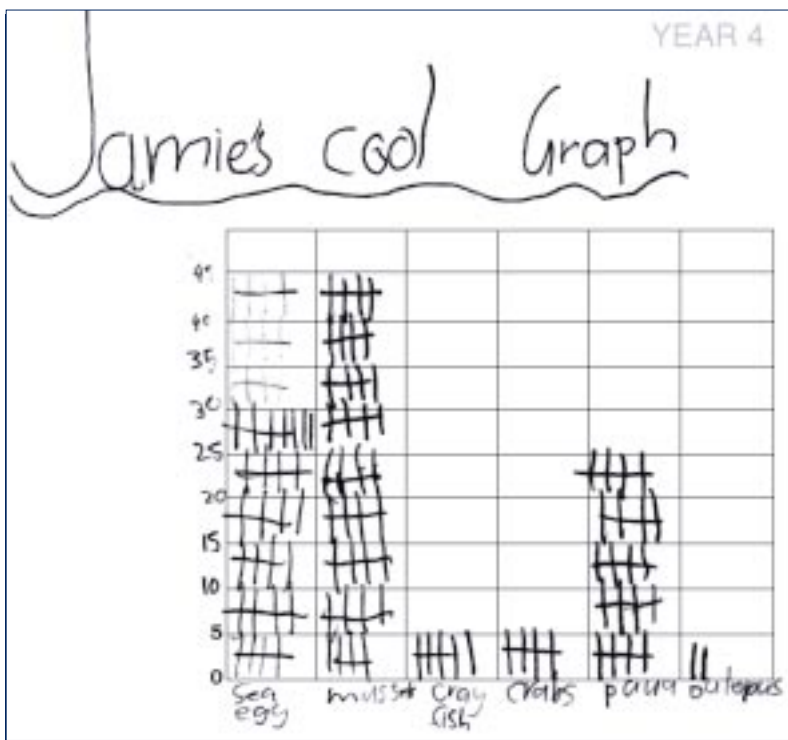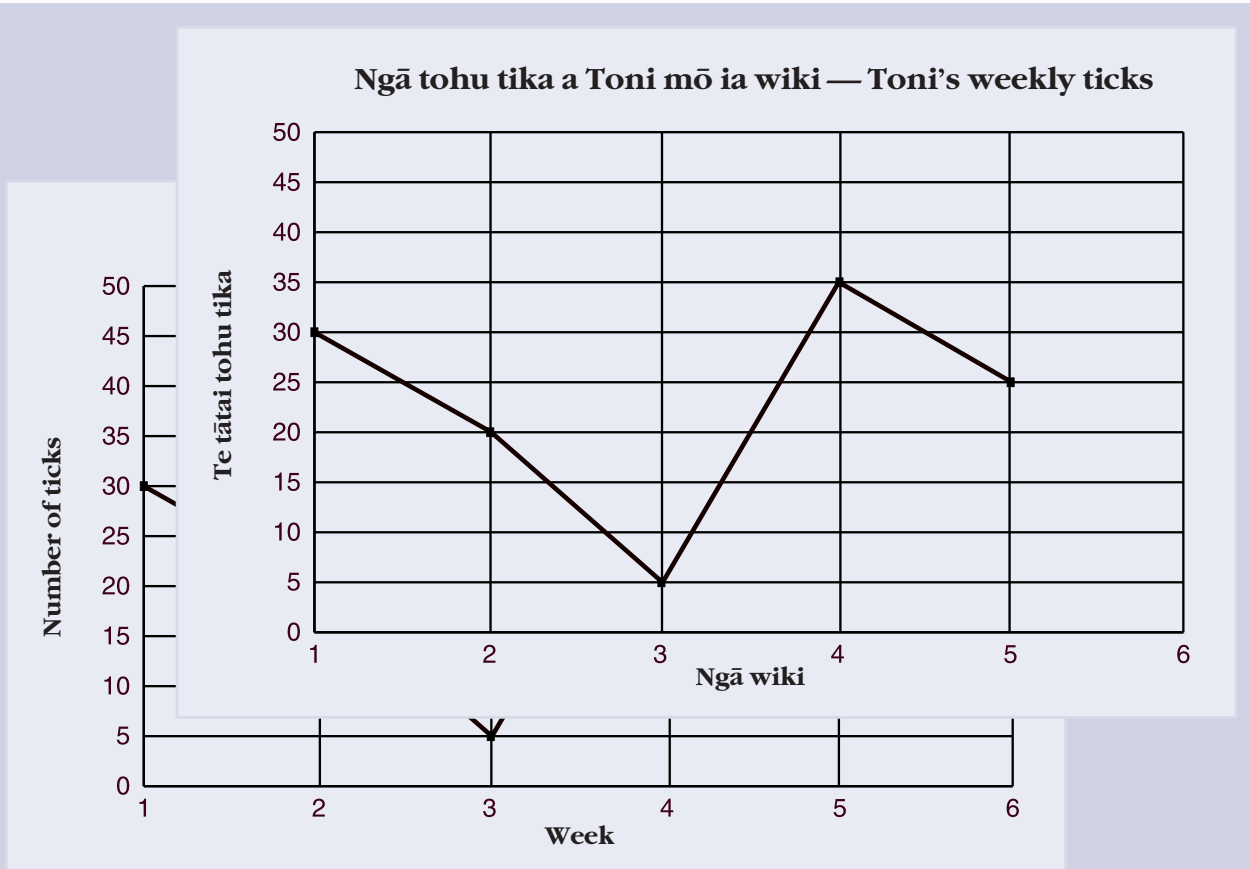
Five of the twenty-seven tasks reported here had significant problems with the Māori translations or task administration procedures. These problems are clearly identified in the commentaries for the tasks. This left twenty-two tasks on which the performance of Māori students in general education and Māori students in Māori immersion settings could be compared. The two categories of students performed equally well on seventeen tasks, with students in immersion programmes scoring statistically significantly higher on one task and Māori students in general education scoring statistically significantly higher on four tasks. These comparisons must be viewed with considerable caution, for the reasons discussed in Chapter 2.

Ngā Whiwhinga Whakahau a Toni — Treats for Toni

Approach: Independent
Focus: Interpreting a line graph.
Resources: None

Ngā tohu tika a Toni mō ia wiki — Toni's weekly ticks

Te tātai tohu tika / Ngā wiki

Number of ticks / Week

Questions/Instructions:

When Toni does something good or kind, Toni's mother puts a tick on a chart.

On Friday Toni's mother counts the ticks.

For every 10 ticks, Toni can choose a treat.

Kia pai te mahi, te atawhai rānei a Toni, ka tuhia e tōna māmā he tohu tika ki runga i tētahi mahere.

I te Rāmere, ka tātai tōna māmā i ngā tohu tika.

Mō ia huinga tekau, ka whiwhi a Toni i tāna e hiahia ana.

1. How many ticks did Toni get on week
   I te wiki tuatahi, e hia ngā tohu tika a Toni?

	% responses GEd	MI
30	91	88

2. Which week did Toni not get a treat?
   Ko tēhea te wiki, kāore a Toni i whiwhi?

	% responses GEd	MI
week 3	64	19

3. Which week did Toni get 25 ticks?
   Ko tēhea te wiki i whiwhi ai a Toni i te rua tekau ma rima tohu tika?

	GEd	MI
week 5	85	85

4. How many treats could Toni choose on week 2?
   I te wiki tuarua, e hia ngā whiwhinga, hei kowhiringa mā Toni?

	GEd	MI
2	66	27

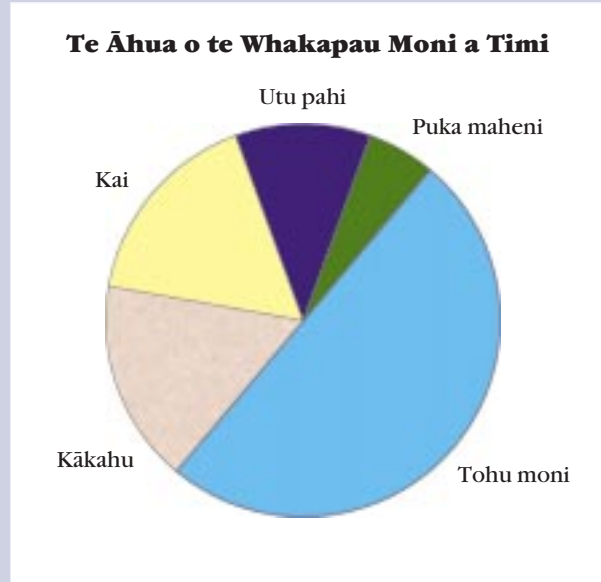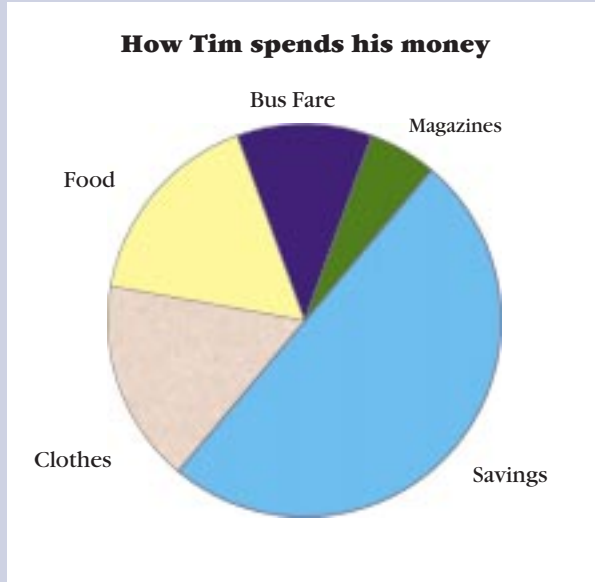| Total score:	GEd	MI
4	49	15
3	21	16
2	19	56
0-1	11	19

Commentary:

There were substantial problems with the Māori translations of questions 2 and 4, clearly reflected in the results obtained. Accordingly, statistical comparison of the results was not appropriate.

Te Tahua a Timi — Tim's Budget

Approach: One to one
Focus: Interpreting a pie graph.
Resources: Graph

How Tim spends his money

Bus Fare
Magazines
Food
Clothes
Savings

Te Āhua o te Whakapau Moni a Timi

Utu pahi
Puka maheni
Kai
Kākahu
Tohu moni

Questions/Instructions:

	% responses	
	GEd	**MI**

Give student the graph.

Tim works as a paper boy and earns $30 per week.

He made this graph to show what he spends his money on.

Ko te mahi a Timi he tohatoha nūpepa, ana ka whiwhi ia i te $30 mō ia wiki.

I mahia e ia tēnei kauwhata, kia kite ai ia i pau ana moni ki te aha.

1. How does Tim use most of his money?
   Whakapau pēhea ai a Timi i te nuinga o ana moni?

		savings	91	85

2. What does he spend the least amount on?
   Whakapau iti rawa atu ia, ki te aha?

	magazines	99	98

	% responses	
	GEd	**MI**

3. What items does he spend the same amount on?
   Whakapau ōrite ai ia ki ēhea?

	clothes & food	99	94

4. If Tim spent all of his clothes money on food, would he spend more on food or on savings?
   Ki te whakapaungia e Timi te katoa o ngā moni hoko kākahu ki te hoko kai, ka nui kē tana whakapau ki te hoko kai, ka nui kē atu rānei, tana tohu moni?

	savings	86	85
Total score: 4		84	75
	3	12	17
	0–2	4	8

Commentary:
Overall the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

Rangi

Approach: One to one
Focus: Reading a street map effectively.
Resources: Map, street list, red pencil.

Question/instructions:	% responses	
	GEd	**MI**

Give the student the map and the street list.

Here is a map of Rangi.

Anei te mahere o Rangi.

1. First of all find East School, then tell me the name of the street it is on.

   Tuatahi, kimihia Te Kura Rāwhiti, kātahi ka kī mai ki a au te ingoa o te tiriti kei reira te kura.

	GEd	MI
found school	98	100
Mill Street	98	100

2. Now use the index to find what part of the map Rimu Street is on. Tell me the grid reference. For example the grid reference for West School is A2.

   Nā, whakamahia te <u>kuputohu</u> [index] kia kitea ai kei tēhea wāhi o te mahere te Tiriti o Rimu. Kī mai ki a au he aha te <u>whainga raumata.</u>[grid reference]. Hei tauira, he A2 te whainga raumata mo te Kura Hauāuru.

	GEd	MI
B3	98	96

Give the student the red pencil, and the recording book folded open to the map.

3. Now show me the shortest way to get from Rangi College gate to the swimming pool. Draw it on the map with the red pencil.

   Nā, whakaaturia mai te ara poto rawa mai i te tomokanga o te Kura Tuarua o Rangi ki te <u>kōpua kaukau</u> [swimming pool]. Tuhia ki runga i te mahere mā te pene rākau whero.

	GEd	MI
correct route	40	50

Rangi Map Grid Reference Index
Te Mahere o Rangi Kuputohu Whainga Raumata

A
Anne St B4

B
Bee St C1

C
Cot Rd A1

D
David Cres A1
Dee Rd A2

E
Early St B2

G
Graham St B3
Grey St B2

H
Holmes Rd C4

I
Iti Pl C4

J
Janice Pl C2

K
Kea Lane C2

L
Lester Rd A4
Linda St C1
Liz Pl C2

M
Mill St C3
Miriam Rd A2

N
Ngaio Rd B3

O
Oak Pl C3

P
Park St C2

R
Rata St B4
Rewa St A4
Rimu St B3
Rua St A3

T
Tahi St B2
Terry Rd C3
Toru St A3

W
Webb St A4
Whites Rd B3

Y
York St A3

Places of Interest
Cemetery B2
East School C3
Rangi College A3
Swimming Pool C2
Tui Park C1
West School A2

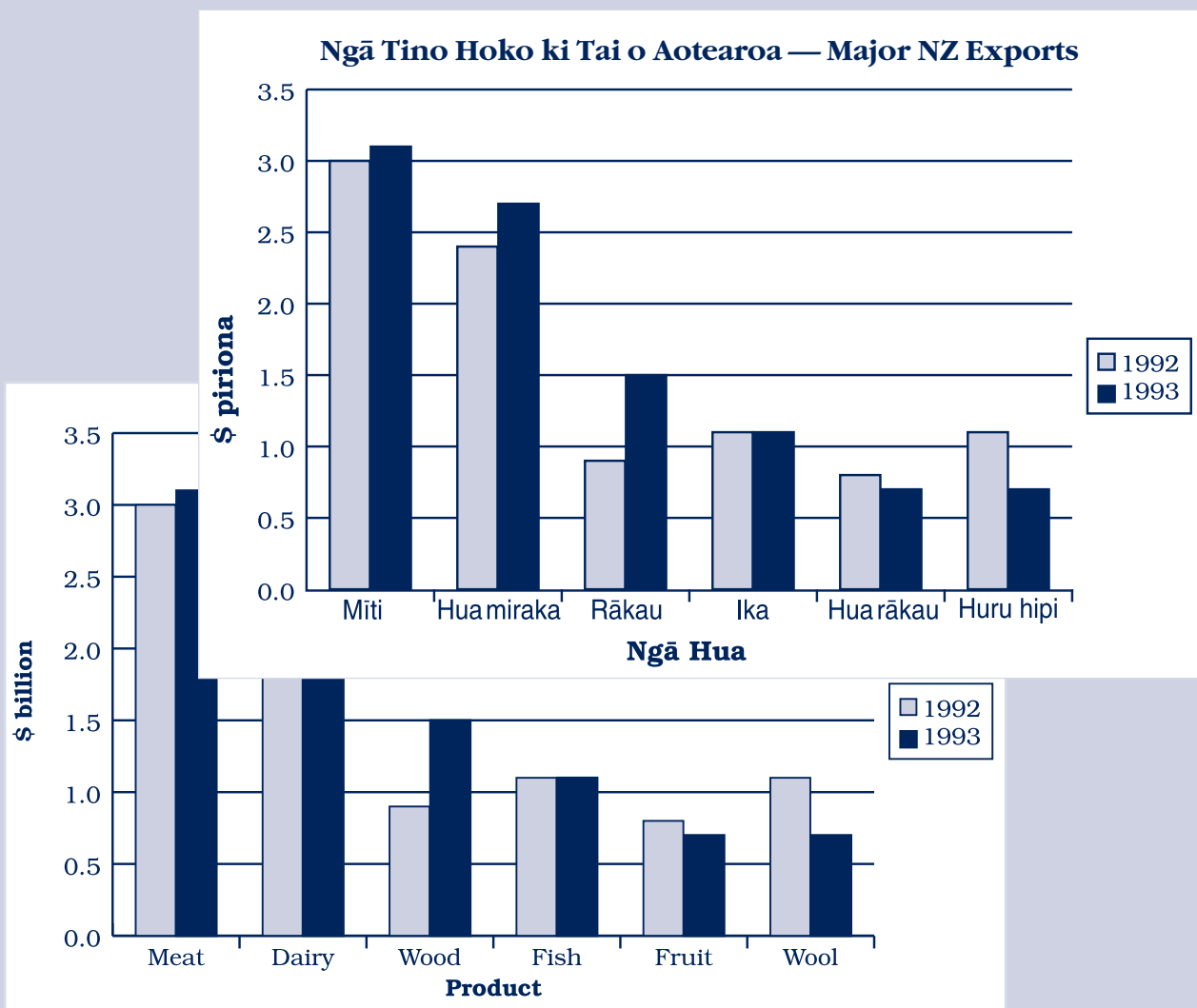Map of Rangi
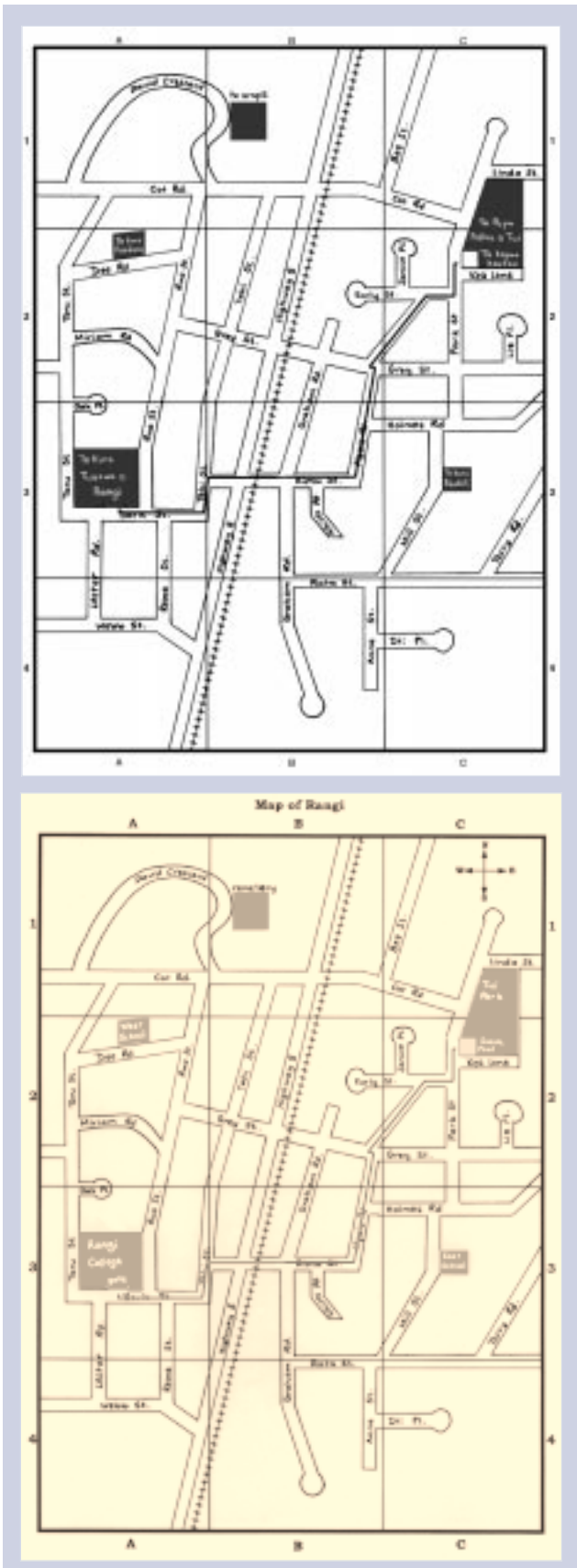
Commentary:

Overall the results obtained by MI and GEd students were not statistically significantly different.

Ngā Tino Hoko ki Tai o Aotearoa — Major New Zealand Exports

Approach: Independent
Focus: Interpreting a bar graph.
Resources: None

Ngā Tino Hoko ki Tai o Aotearoa — Major NZ Exports

Questions/instructions:		% responses	
		GEd	**MI**
1. Which product earned the most money for New Zealand?			
Riro mai ai te nuinga o te moni mō Aotearoa i tēhea hua?			
	meat	96	90
2. How much money did New Zealand earn from exporting wood in 1993?			
E hia ai te rahi o te moni i riro mai i a Aotearoa, mō te hoko rākau ki tai, i te tau 1993?			
correct number 1.5		81	79
units attached: both *$* and *billion*		25	8
either *$* or *billion*		41	35

		% responses	
		GEd	**MI**
3. Which product had the biggest increase in export earnings ($ billion) from 1992 to 1993?			
Ko tēhea te hua hoko ki tai, nui kē atu te pikinga o āna whiwhinga [$ piriona] mai i te tau 1992 ki te 1993?			
	wood	49	15

Commentary:

The Māori word "hua" was used in questions 1 and 3, and in two product names. This appears to have mislead some MI (Māori Immersion) students. Accordingly, statistical comparison of MI (Māori Immersion) and GEd (General Education) performance was not appropriate.

Te Pikiniki o te Kura — School Picnic

Approach: Station
Focus: Interpreting an extended weather forecast chart.
Resources: Extended weather forecast chart.

Question/instructions:

A school in Wellington is planning to have a picnic during one of the school days this week.

Look at the extended forecast on the chart.

Kei te whakaaro tētahi kura o Te Whanga-nui-ā-Tara ki te pikiniki ā tētahi o ngā rā kura o te wiki.

Titiro ki te mahere matapae roa.

Extended forecast

| | rain likely | rain possible | rain unlikely |

	Sun	Mon	Tue	Wed	Thu
Auckland	light winds, mostly fine	light winds, fine	moderate S, showers	light SW, becoming fine	variable winds, mostly fine
Wellington	variable winds, fine	fresh N, some cloud	fresh S, showers	moderate S, risk of showers	moderate NW, mostly fine
Nelson	light winds, fine	moderate N, some high	moderate SW, few showers	light SW, some cloud	moderate N, mostly fine
West Coast	light winds, fine	SW change, showers later	fresh SW, shwrs clearing	light S, mostly fine	moderate SW, risk of showers
Fiordland	light winds, fine	SW change, showers later	fresh SW shwrs clearing	light S, some cloud	moderate SW, risk of showers
Marl-borough	coastal NE, fine	coastal NE, some high	moderate SW, few showers	coastal NE, some cloud	coastal NE, mostly fine
Canterbury	coastal NE, fine	coastal NE, cloud	moderate SW, few showers	coastal NE, some cloud	coastal NE, mostly fine
Otago and Southland	coastal NE, fine	SW change, showers later	fresh SW, shwrs clearing	light S, some cloud	moderate S, risk of showers
South Coast	light winds, mostly fine	SW change, showers later	fresh SW, shwrs clearing	light S, some high cloud	moderate S, risk of showers

© The Press   Design by Standout Maps and Graphics

	% responses	
	GEd	**MI**
1. Which days would be best for the picnic?		
Ko ēhea **ngā rā** tino pai mō te pikiniki?		
Monday and Thursday	28	7
Monday, Thursday and Sunday	20	7
Monday or Thursday (with or without Sunday)	28	36
other	24	50

	% responses	
	GEd	**MI**
2. Why do you think they are the best days?		
He aha koe i whakaaro ai koinei ngā rā tino pai?		
fine / rain unlikely / no rain	83	48

He mahere matapaenga roa

		ua terā tonu pea	ua terā pea	ua kaore pea

	Rātapu	Mane	Tūrei	Wenerei	Tāite
Tāmaki-makau-rau	hau kōhengi, paki te roanga atu	hau kōhengi, paki	tonga āhua kaha, tūāua	tonga mā uru kōhengi, taihoa ka paki	hau tāupe, paki te roanga atu
Te Whanganui-ā-Tara	hau tāupe, paki	raki tio, ētahi kapua	tonga tio, tūāua	tonga āhua kaha, tērā ka tūāua	raki mā uru āhua kaha, paki te roanga atu
Whakatū	hau kōhengi, paki	raki āhua kaha, he kapua teitei	tonga mā uru āhua kaha, tūāua ruarua	tonga mā uru kōhengi, he kapua	raki āhua kaha paki te roanga atu
Te Tai-ō-Poutini	hau kōhengi, paki	tonga mā uru kōrure tūāua ā-taihoa ake nei	tonga mā uru tio, tūāua, taihoa ka mahea	tonga kōhengi, paki te roanga atu	tonga mā uru āhua kaha, tērā pea he tūāua
Te Whakataka Kārehu-a-Tamatea	hau kōhengi, paki	tonga mā uru kōrure tūāua ā-taihoa ake nei	tonga mā uru tio, tūāua, taihoa ka mahea	tonga kōhengi, he kapua	tonga mā uru āhua kaha, tērā pea he tūāua
Wairau	pākihiroa takutai, paki	pākihiroa takutai, he kapua teitei	tonga mā uru āhua kaha, tūāua ruarua	pākihiroa takutai, ētahi kapua	pākihiroa takutai, paki te roanga atu
Waitaha	pākihiroa takutai, paki	pākihiroa takutai, he kapua	tonga mā uru āhua kaha, tūāua ruarua	pākihiroa takutai, ētahi kapua	pākihiroa takutai, paki te roanga atu
Otāgo me Murihiku	pākihiroa takutai, paki	tonga mā uru kōrure, tūāua ā-taihoa ake nei	tonga mā uru tio, tūāua, taihoa ka mahea ake	tonga kōhengi, he kapua	tonga āhua kaha, tērā pea he tūāua
Takutai	hau kōhengi, paki te roanga atu	tonga mā uru kōrure, tūāua ā-taihoa ake nei	tonga mā uru tio, tūāua, taihoa ka mahea ake	tonga kōhengi, he kapua teitei	tonga āhua kaha, tērā pea he tūāua

You win a free holiday for a week and can choose any place on the chart.

You want to have fine weather.

Ka waimarie koe ki tētahi hararei kore utu mō te wiki, ā, māu anō e whiriwhiri tētahi wāhi kei runga i te mahere.

E hiahia rangi pai ana koe.

3. Which would be the **best** place for your holiday?

   Ko tēhea te wāhi **tino pai** mō tō hararei?

	% responses	
	GEd	**MI**
Nelson or Marlborough or both	65	45

4. Why do you think this would be the best place for your holiday?

   He aha koe i whakaaro ai koinei te wāhi tino pai mō tō hararei?

	% responses	
	GEd	**MI**
fine / no rain plus additional appropriate detail	27	7
fine / no rain	43	25

Commentary:

The Māori terms used to describe the weather were distinctly more complex than the corresponding English versions. Accordingly, statistical comparison of MI (Māori Immersion) and GEd (General Education) performance was not appropriate.

Bay Express

Approach: Station
Focus: Interpreting a train timetable.
Resources: Train timetable.

The Bay Express

- Comfortable carpeted carriages, most with panoramic windows
- Both table and airline seating and at seat service
- Light meals, snacks, beer, wine, spirits soft drinks avaiable for purchase
- Special meals can be ordered at the time of reservation (diabetic/wheat free/vegetarian) for purchase on-board – 48 hours advance booking required
- Informative commentary on points of interest en route
- Observation lounge at rear of most trains

Daily Timetable

Wellington – Napier
Train 0600

Arrives 1.22pm Napier

1.05pm	Hastings
12.15pm	Waipukurau
10.54am	Woodville
9.33am	Levin
8.21am	Porirua

Departs 8.00am Wellington

Napier – Wellington
Train 0601

Wehe atu 2.05pm Ahuriri

| 2.29pm | Hastings |

Information:

CALL FREE on

The Bay Express

- Comfortable carpeted carriages, most with panoramic windows
- Both table and airline seating and at seat service
- Light meals, snacks, beer, wine, spirits soft drinks avaiable for purchase
- Special meals can be ordered at the time of reservation (diabetic/wheat free/vegetarian) for purchase on-board – 48 hours advance booking required
- Informative commentary on points of interest en route
- Observation lounge at rear of most trains

Wātaka ā-rā

Whanganui-ā-tara – Ahuriri
Train 0600

Tae mai 1.22pm Ahuriri

1.05pm	Hastings
12.15pm	Waipukurau
10.54am	Woodville
9.33am	Taitoko
8.21am	Porirua

Wehe atu 8.00am Whanganui-ā-tara

Ahuriri – Whanganui-ā-tara
Train 0601

Wehe atu 2.05pm Ahuriri

2.29pm	Hastings
3.16pm	Waipukurau
4.41pm	Woodville
5.59pm	Taitoko
7.18pm	Porirua

Tai mai 7.36pm Whanganui-ā-tara

Information:

CALL FREE on 0800 TRAINZ   17

Questions/instructions:

Look at *The Bay Express* timetable.

Use the timetable to help you answer the questions.

Tirohia te wātaka o te "Bay Express".

Whakamahia te wātaka hei āwhina ki te whakahoki i ngā pātai.

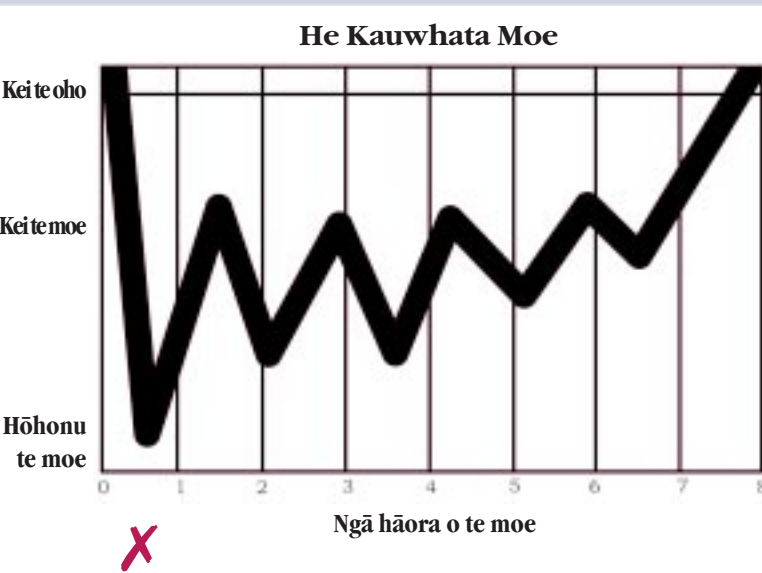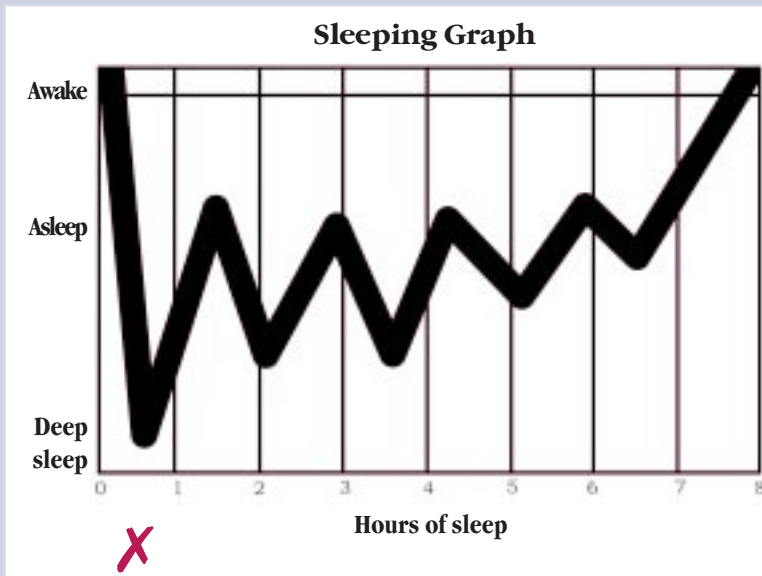|	% responses	
	GEd	MI
1. If you live in Napier and you want to go to Levin, which train would you catch?		
Mehemea kei Ahuriri koe e noho ana, ā, kei te pīrangi haere koe ki Taitoko, ka hopu koe i tēhea tereina?		
0601 Napier to Wellington	58	47
2. What time should your train leave Napier?		
He aha te wā wehe atu tō tereina i Ahuriri?		
2.05pm	68	56
3. What time should you arrive in Levin?		
He aha te wā ka tae atu koe ki Taitoko?		
5.59pm	61	40
4. What time should the train leave Levin to go back to Napier?		
He aha te wā ka wehe atu ai te tereina mai i Taitoko ki te hoki ki Ahuriri?		
9.33am	47	36
5. What time should you arrive in Napier?		
He aha te wā ka tae koe ki Ahuriri?		
1.22pm	75	56
Used units: always	82	67
sometimes	15	26
Total score: 7	30	13
5–6	29	31
3–4	31	34
0–2	10	22

Commentary:

Overall, MI (Māori Immersion) students scored statistically significantly lower than GEd (General Education) students on this task.

Te Moe — Sleeping

Approach: Independent
Focus: Interpreting a line graph.
Resources: None

Sleeping Graph

Awake
Asleep
Deep sleep

Hours of sleep

He Kauwhata Moe

Kei te oho
Kei te moe
Hōhonu te moe

Ngā hāora o te moe

Questions/instructions:	% responses	
	GEd	**MI**

Here is a graph that gives information
about a person's sleep.

Have a good look at the graph.

Anei tētahi kauwhata e whakaatu ana i te moe a tētahi tangata.

Me āta titiro ki te kauwhata.

|	**GEd**	**MI**
1. When did the deepest sleep occur? Put a cross under the line where the deepest sleep occurred. *Ko tēhea te wā i tino hōhonu ai te moe? Tuhia he rīpeka ki raro iho o te rārangi i hōhonu rawa atu te moe.*		
marked middle of first hour	90	81
2. How long did the person sleep for? *E hia te roanga moe o te tangata nei?*		
7.5 to 8 hours	52	57
Total score: 2	47	55
1	49	28
0	4	17

Commentary:
Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

Taraiwa Hararei — Holiday Drive

Approach: Independent
Focus: Interpreting a time/distance line graph.
Resources: None

Questions/instructions:

Kate went on a car trip with her family. Back at school Kate made a graph to show how far her family travelled and how long it took them.

I haere a Keita me tōna whānau ki tētahi hararei mā runga motokā. I te hokinga mai o Keita ki te kura ka hangaia e ia he kauwhata hei whakaatu i pēhea rawa te tawhiti o tā rātou haere ko tana whānau, ā, e hia hāora te roa.
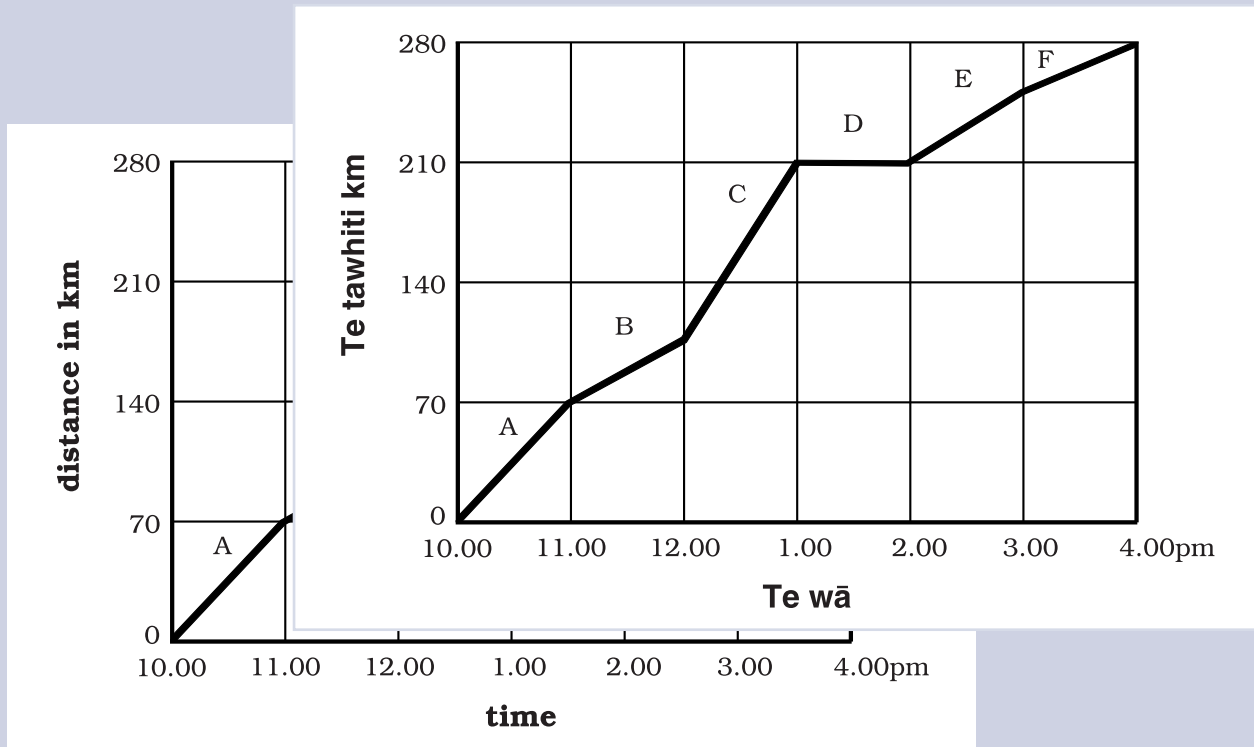
Look at the graph to help you answer the questions.

Tirohia te kauwhata hei āwhina i a koe ki te whakahoki i ngā pātai.

		% responses
		GEd	**MI**

1. How far did Kate's family travel in the first hour?

   I te hāora tuatahi i pēhea te tawhiti o te haere a Keita me tōna whānau?

	GEd	MI
70 km	79	64
70	10	16

2. Which letter on the graph shows when the family stopped for lunch?
   Ko tēhea pū i te kauwhata e whakaatu ana nō nahea te whānau i tau ai ki te kai?

	GEd	MI
D	39	52

3. Which letter on the graph shows when they travelled the fastest?
   Ko tēhea pū i te kauwhata e whakaatu ana i te tino tere rawa o tā rātou haere?

	% responses	
	GEd	MI
C	51	58

4. How far had they gone after 3 hours?
   I pēhea te tawhiti o tā rātou haere i te hipatanga o te toru hāora?

	GEd	MI
210 km	57	32
210	11	26
Total score: 5–6	39	34
3–4	37	36
1–2	20	20
0	4	10

Commentary:

Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

Ngā Rawa Kura a te Kaitiora — Pirate Treasure

Approach: Station

Focus: Interpreting a map, including grid references, and recording responses on the computer.

Resources: Macintosh Powerbook 5300cs computer, mouse, headphones, mousepad, Hypercard® program.
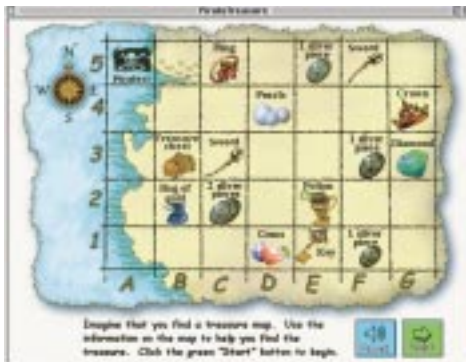
Questions/instructions:	% responses	
	GEd	MI
Students had two chances to get each instruction correct. If they still had it wrong they were shown the correct answer before moving on to the next instruction.		
Imagine that you find a treasure map. Use the information on the map to help you find the treasure. Click the green button to start.		
Me whakaaro pohewa noa, kua kitea e koe he mahere rawa kura. Whāia ngā mōhiohio o te mahere hei āwhina i a koe, ki te kimi i ngā rawa kura. Pāwhiria te pātene kākāriki 'Tīmata'.		
Your boat lands on B4. Click to show where you are.		
Ka tau tō waka i te E4. Pāwhiria, kia whakaaturia mai kei hea koe.		
1st attempt	87	77
2nd attempt	3	8
It's good to take a compass with you. Click on the compass.		
He pai tonu te mau kāpehu. Whakaaturia ai tērā kei hea te raki, te tonga, te rāwhiti me te hauāuru. Pāwhiria atu te kāpehu.		
1st attempt	88	62
2nd attempt	10	27
Using your compass travel 2 places east. Click to show where you are going		
Whaia te kāpehu, kia ahu ki te rāwhiti mā te rua nekehanga. Pāwhiria, kia whakaaturia mai kei whea koe e haere ana.		
1st attempt	63	49
2nd attempt	9	11

|	% responses	
	GEd	MI
You now set off to the south. Go three places. Click to show where you are going.		
Inaianei ka ahu koe ki te tonga. Kia toru ngā nekehanga. Pāwhiria, kia whakaaturia mai kei whea koe e haere ana.		
1st attempt	77	70
2nd attempt	9	11
You now set off in a north west direction. Move two places. Click on your new position.		
Na, ka ahu koe inaianei ki te uru mā raki. Kia rua ngā nekehanga. Pāwhiria, kia whakaaturia mai tō tūranga hou.		
1st attempt	65	32
2nd attempt	12	10
Help! Pirates! They have taken your boat. Go to A2 to get your boat back. Click on A2		
Ai! Aue. He kaitiora! Kua whānakohia tō waka. Neke atu ki te A2 kia riro mai anō tō waka. Pāwhiria te A2.		
1st attempt	81	75
2nd attempt	11	17
Total score: 12	36	9
10–11	29	31
7–9	20	32
4–6	14	22
0–3	1	6

Commentary:

Overall, MI (Māori Immersion) students obtained statistically significantly lower scores than GEd (General Education) students on this task.

He Mahere Hopuni — Camp Map

Approach: Station
Focus: Reading a map and using a map scale.
Resources: Map, ruler.
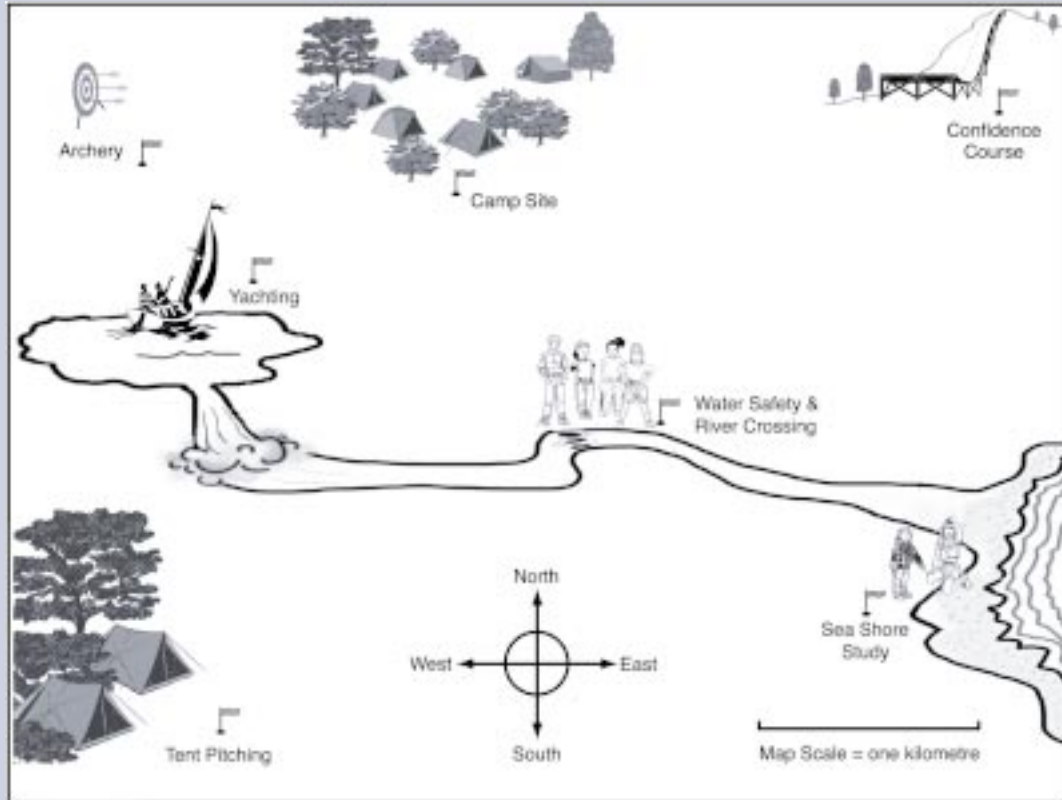
Questions/instructions:

Here is a map of a camp site and activities. Look at the **map scale** and the **compass** to help you answer the questions.

Anei he mahere o te papa hopuni me ngā ngohe. Tirohia te **mahere āwhata** [scale] me te **kāpehu** [compass] hei āwhina i āu whakautunga pātai.

Put a ring around the letter beside the best answer.
Porohitatia te pū e tika ana.

	% responses	
	GEd	**MI**

1. About how far is it from the camp site to the yachting?

E hia te tawhiti atu o te pere rua mai i te papa hopuni?

a. 1 kilometre	1 kiromita	a	60	80
b. 2 kilometres	e 2 kiromita			
c. 3 kilometres	e 3 kiromita			
d. 5 kilometres	e 5 kiromita			

(ringed: a.)

	% responses	
	GEd	**MI**

2. About how far is it from the camp site to the tent pitching?

E hia te tawhiti atu o te pūpahi mai te papa hopuni?

a. 1 kilometre	1 kiromita			
b. 2 kilometres	e 2 kiromita			
c. 3 kilometres	e 3 kiromita	c	48	54
d. 5 kilometres	e 5 kiromita			

(ringed: c.)

3. Which distance is the smallest?
Ko tēhea te haere iti?

a. between camp site and seashore study?
mai i te papa hopuni ki te tūhura taha moana?

b. between camp site and tent pitching?
mai i te papa hopuni ki te pūpahi?

c. between camp site and water safety?
mai i te papa hopuni ki te marutau wai?

(ringed: c.) c 91 73

	% responses			% responses	
	GEd	**MI**		**GEd**	**MI**
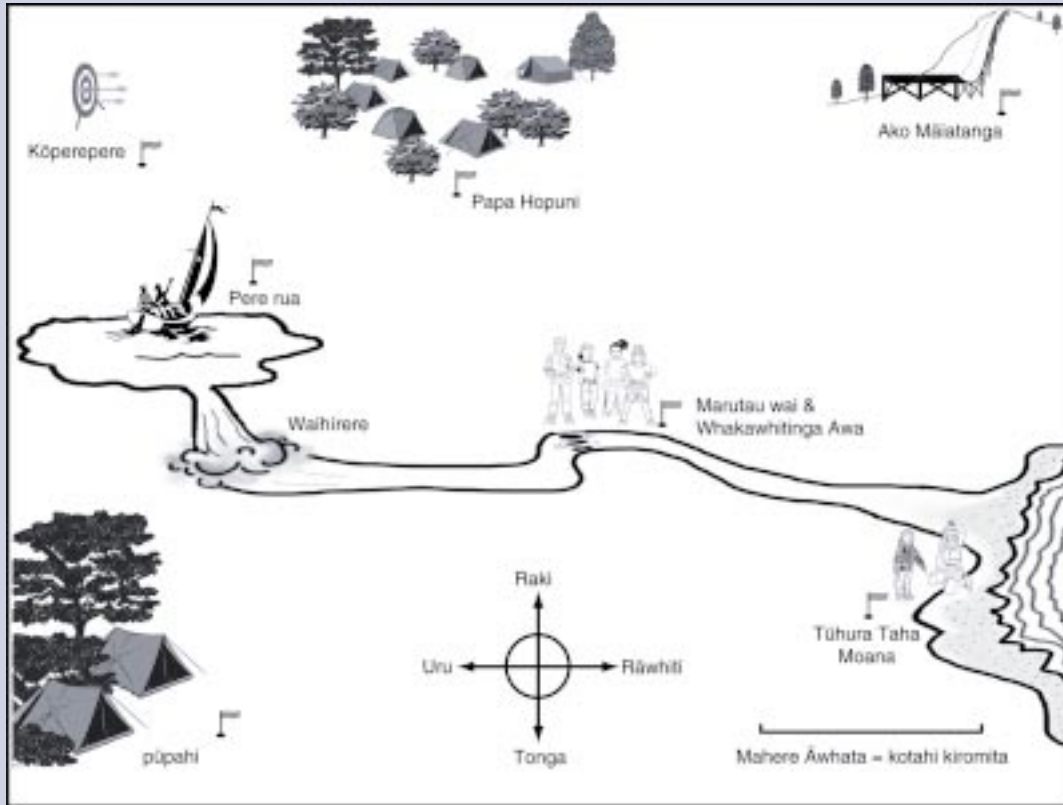
4. In which direction does the river flow from the waterfall to the sea shore?

   Rere pēhea ai te awa mai i te waihīrere ki te taha moana?

			GEd	MI
a. North	Raki			
b. South	Tonga			
c. East	Rāwhiti	c	88	78
d. West	Uru			

5. Which activity is west of the camp site?

   Ko tēhea te ngohe kei te uru o te papa hopuni?

   Write your answer on the line.

|	GEd	MI
archery	61	41
yachting or tent pitching	21	22

Commentary:

Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

He Whare — Houses

Approach: Station

Focus: Pictures numbered 1 to 5, house plan.

Resources: Understanding a house plan and relating it to the house's appearance.
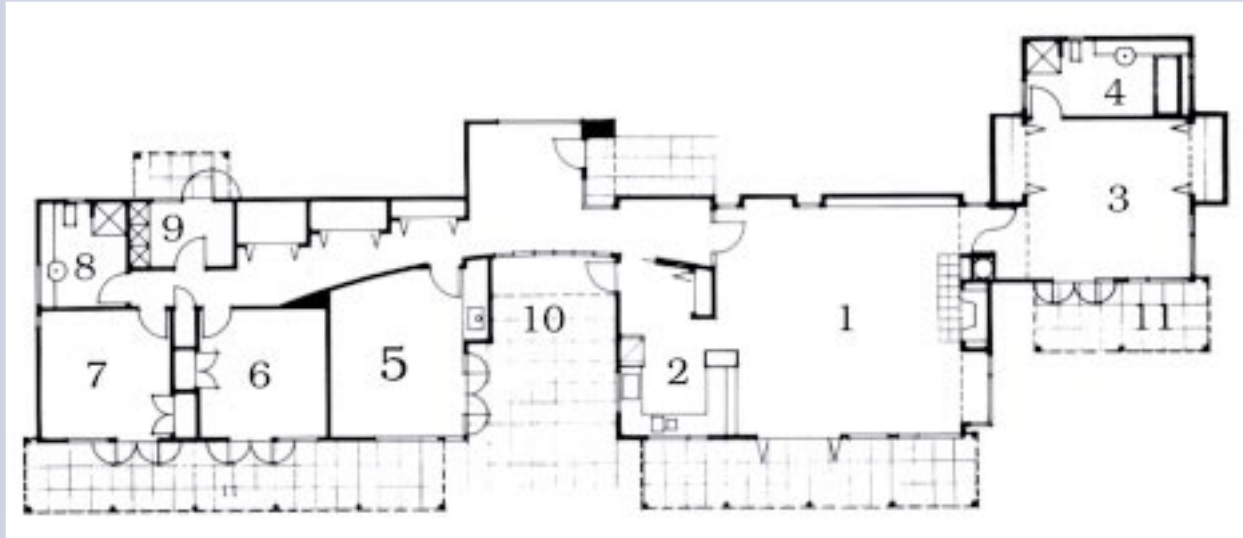
Questions/instructions:

1. Look at the five pictures of houses.
   One of these pictures matches the plan.
   Record the number of the picture.

   Tirohia ngā whakaahua whare e rima.
   Ka hāngai tika tētahi o ēnei whakaahua
   ki te mahere.
   Tuhia te tau o taua whakaahua.

2. If your bedroom is room 6, which
   room will you go through to get to
   the master bedroom?

   Mena ko te tau 6 tō taiwhanga moe
   [bedroom] haere ai koe mā tēhea taiwhanga
   kia tae ki te taiwhanga moe matua?

	% responses	
	GEd	**MI**
picture 2	63	67
room 1 (living room)	62	39
Total score: 2	43	24
1	38	59
0	19	17

Commentary:

Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

Kei te Aha Kē? — What's Happening?

Approach: Station

Focus: Interpreting a bar graph.

Resources: Graph
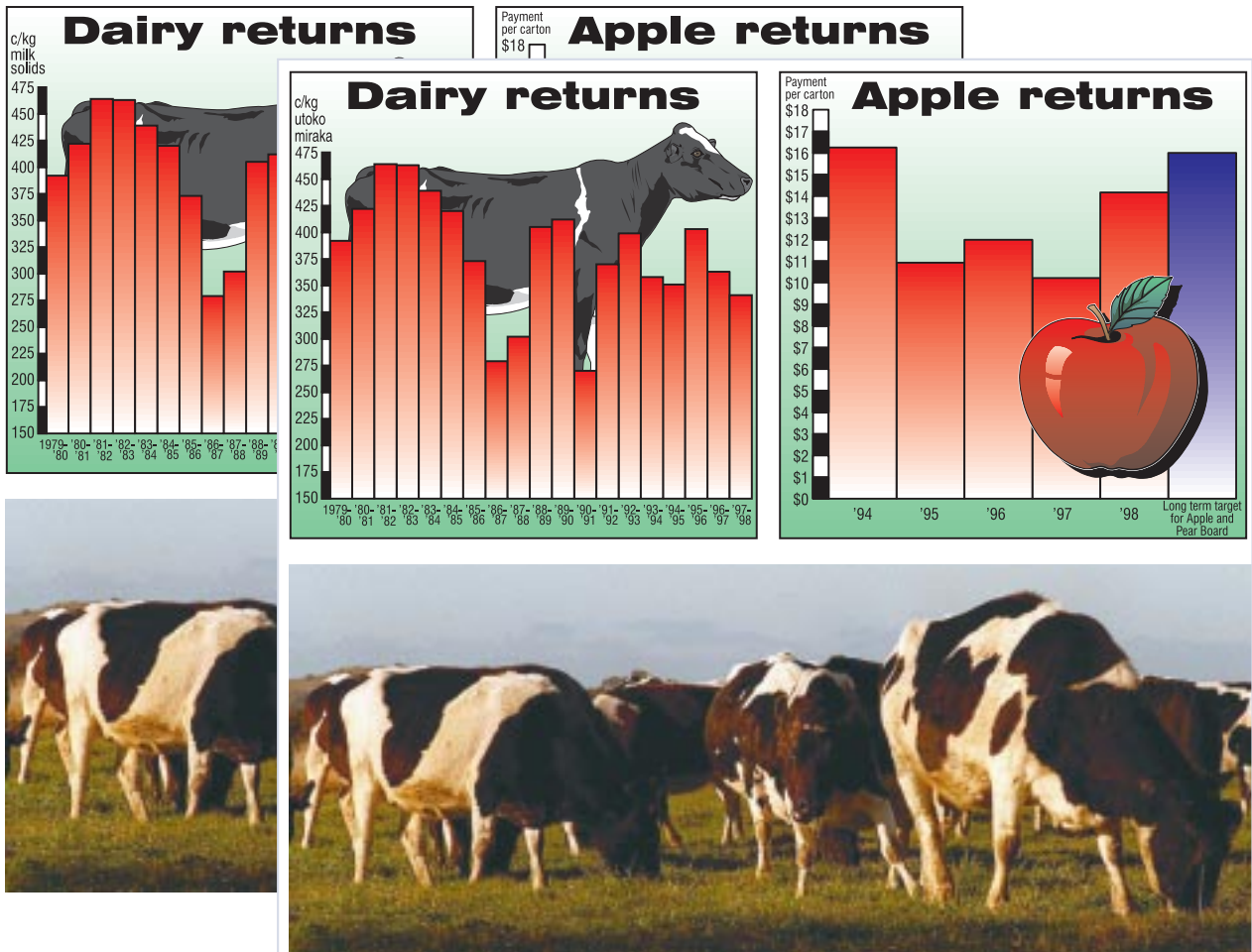
Questions/instructions:

Look at the graph and answer the questions.

Tirohia te kauwhata kātahi ka whakautu ai i ngā pātai.

	% responses	
	GEd	MI

1. Which year was the hardest for an apple farmer?

Ko tēhea te tau tino uaua rawa atu ki te <u>kaiahuwhenua</u> [farmer] āporo?

	GEd	MI
1997	66	61

2. How much did a farmer get for a box of apples in 1994?

E hia te whiwhinga a te kaiahuwhenua mō tētahi <u>pouaka</u> [carton] āporo i te tau 1994?

	GEd	MI
$16 – $16.50	74	77
16 – 16.5	9	5

3. In which years were farmers paid 275 cents for each kg of milk solids?

Ko ēhea tau i utua ai te 275 hēneti ki ngā kaiahuwhenua mō ia kirokarama <u>utoka miraka</u> [milk solids]?

	GEd	MI
both 86–87 & 90–91	7	2
one of 86–87, 90–91	71	68

4. What were the best years for a New Zealand dairy farmer?

Ko ēhea ngā tau tino pai rawa atu ki tētahi <u>kaiahuwhenua miraka kau</u> [dairy farmer] o Aotearoa?

	GEd	MI
both 81–82 & 82–83	29	18
one of 81–82, 82–83	48	37

Commentary:

Overall, the results obtained by MI (Māori immersion) and GEd (General Education) students were not statistically significantly different.

Mēhiko—Mexico

Approach: One to one
Focus: Interpreting a map of Mexico and Central America.
Resources: Map of Mexico, ruler.

Questions/instructions:

In this activity we'll be looking at this map of Mexico. Have a look at the map. Then I'll ask you some questions.

Mo tēnei mahi ka titiro tāua ki tētahi mahere o Mēhiko. Tirohia te mahere. Nā. He pātai āku ki a koe.

Give student map.
Allow time to look at the map.
If necessary help student to locate places.

1. Look at Mexico City.
   Using the key to help you, tell me two facts about Mexico City.

   Titiro ki Mēhiko — te tāone nui. Mā te whakamahi pū wāhi [key/signs] hei āwhina i a koe, kōrerohia mai kia rua ngā kōrero pono mō Mēhiko — te tāone nui.

	% responses	
	GEd	MI
2000–4000m above sea level	57	21
capital city	72	60
Other correct facts: 2 or more	3	0
1	21	7

2. If I was to travel from Mexico City to Leon, approximately how far would that be? There is a ruler here if you want to use it.

   Ki te takahia e au te nuku o te whenua mai Mēhiko — te tāone nui ki Leon, pēhea rawa te tawhiti? He tauine kei konei, ki te hiahia koe.

	GEd	MI
300–330km	26	28
300–330	2	0

3. The map shows that Mexico has several neighbours.
   Tell me two neighbours of Mexico.

   E whakaatu mai ana te mahere, e hia kē ngā hoa noho tata o Mēhiko. Kōrerohia mai kia rua o ōna hoa noho tata.

	% responses	
	GEd	MI
U.S.A.	67	70
Honduras	25	28
Guatemala	20	19
other correct	3	2
Number correct: 2 or more	43	37
1	30	44

4. Show me where the highest area of land is in Mexico.

   Whakaaturia mai kei hea te nuku whenua [area of land] teitei rawa atu, i Mēhiko.

	GEd	MI
identified correct area	73	60

5. What city is close to 100 degrees longitude and 25 degrees latitude?

   Ko tēhea te tāone nui, tata atu ki te 100 putu ahopou [degrees longitude] me te 25 putu ahopae [latitude]?

	GEd	MI
Monterrey	17	56

Commentary:

A substantial number of MI (Māori Immersion) students were given extra help with this task. Accordingly statistical comparison of MI (Māori Immersion) and GEd (General Education) students was not appropriate.

He Kōwhiringa Kākahu — Choosing a Garment

Approach: Station

Focus: Using a complex table involving garment use symbols.

Resources: Garment table.

Te Kōwhiritanga Kākahu — Choosing A Garment

● **tino pai rawa — Most suitable for**   ▼ **pai ana — suitable for**

			% responses
			GEd **MI**

Questions/instructions:

Use the chart to answer the questions. Garments are clothes.

Whakamahia te tutohi hei whakautu pātai.

1. Liz chose a garment with this sign.

   What activities is it **MOST** suitable for?

   I kōwhiria e Rihi tētahi kākahu e mau waitohu pēnei ana.
   He **tino pai rawa** tēnei mō ēhea mahi?

   golf and bowls   51   50

2. Put circles around the signs for the garments that are only suitable for **one** kind of activity.

   Porohitatia ngā waitohu o ngā kākahu e pai noa iho ana mō tētahi mahi **kotahi**.

   marked symbols for fishing, sailing, and motorcycling   22   21

3. Put a circle around one sign for the garment that is suitable for day walking, trekking, bushwalking, ski touring and fishing.

   Porohitatia tētahi waitohu kotahi, mō te kākahu e tika ana mō te hīkoi, te <u>tāwhai</u> [ski touring], te hīkoi ngahere, te <u>tāpoi retihuka</u> [trekking] me te hī ika.

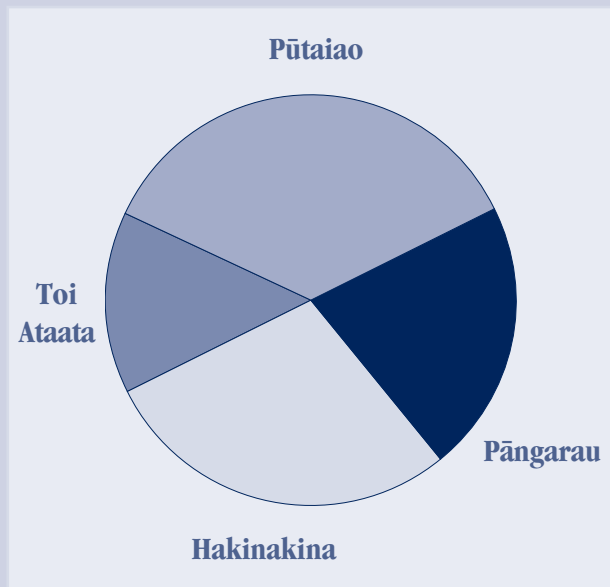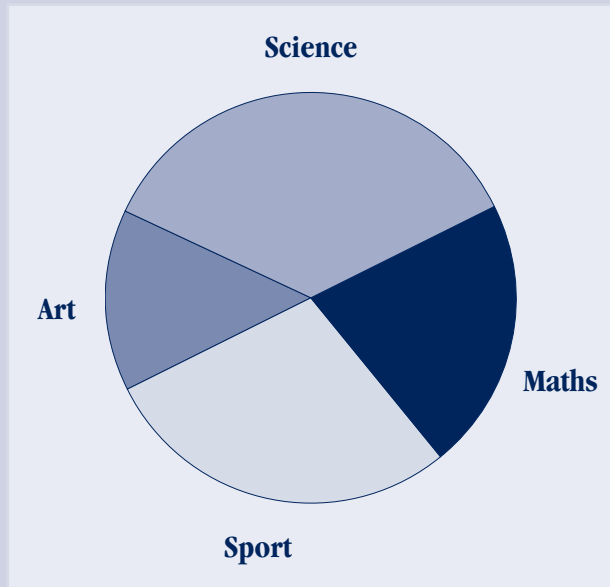   marked symbol for tramping or billy on fire   35   17

Commentary:

Overall, the results obtained by MI (Māori Immersion) and GEd (General Eductaion) students were not statistically significantly different.

Te Kaupapa Kauwhata Porohita — Subject Pie

Approach: Independent
Focus: Labelling a pie graph appropriately.
Resources: None

Questions/instructions:

A class at Long Road School did a class survey of favourite subjects.

The results were:

Maths	6
Science	10
Art	4
Sport	8

The pie graph shows this.

Write labels to show each subject on the graph.

I rangahaua e tētahi rōpū ākonga o Te Kura Huarahi Roa ngā kaupapa tino kaingākau ai rātou.

Ko ēnei ngā putanga iho:

Pāngarau	6
Pūtaiao	10
Toi Ataata	4
Hakinakina	8

Kei te kauwhata porohita e whakaatu mai ana.

Tuhia he tapanga mō ia kaupapa ki te kauwhata porohita.

	% responses	
	GEd	**MI**
top segment labelled science	93	90
right segment labelled maths	90	92
bottom segment labelled sport	88	92
left segment labelled art	93	94
Total score: 4	87	90
2–3	6	2
0–1	7	8

Commentary:

Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

Te Pūtea a Tio — Jo's Savings

Approach: Independent
Focus: Completing a line graph.
Resources: None

Questions/instructions:

Jo is saving money to buy a body board.

The one she likes will cost $55.

She started saving in January, and saved $8.

By the end of February she had saved a total of $17; March, $20; April, $30; May, $35; June, $42.

Kei te tohu moni a Tio hei hoko kōpapa tinana.

E $55 te utu o te kōpapa tinana tino pai ki a ia.

E $8 te moni i tohua e ia, mai i te marama o Kohi-tātea.

I te mutunga o ēnei marama e whai ake nei te katoa o ngā moni, i tohua e ia: Hui-tanguru e $17, Poutū-te-rangi e $20; Paenga-whāwhā e $30; Haratua e $35; Pipiri e $42.

Complete the graph to show how much money Jo had saved by the end of each month.

Jo's Total Savings
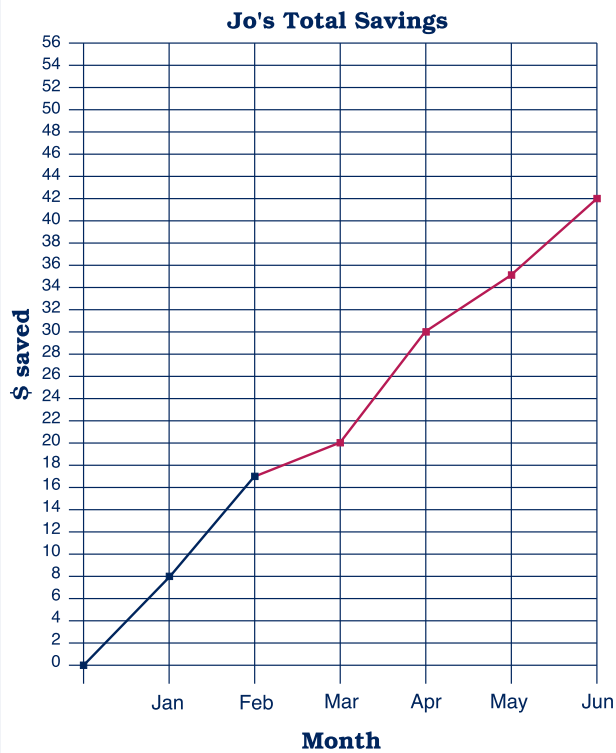
Whakaotingia te kauwhata hei whakaatu i ngā moni i tohua e Tio, i te mutunga o ia marama.

Te Katoa o te Pūtea a Tio
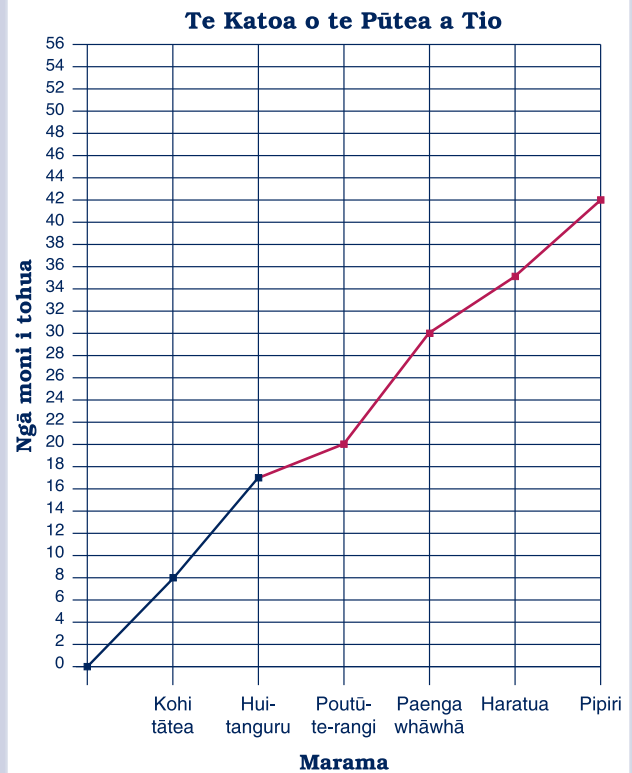
	% responses	
	GEd	**MI**
March, $20	77	78
April, $30	80	83
May, $35	66	59
June, $42	75	72
all points connected with lines	99	91

Commentary:

Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

Ngā Tae ā-Karu — Eye Colours

Approach: Station
Focus: Converting a double bar graph into a table.
Resources: Ruler, pencil.

Eye Colours

Ngā Tae ā-karu

| tama | kōtiro |
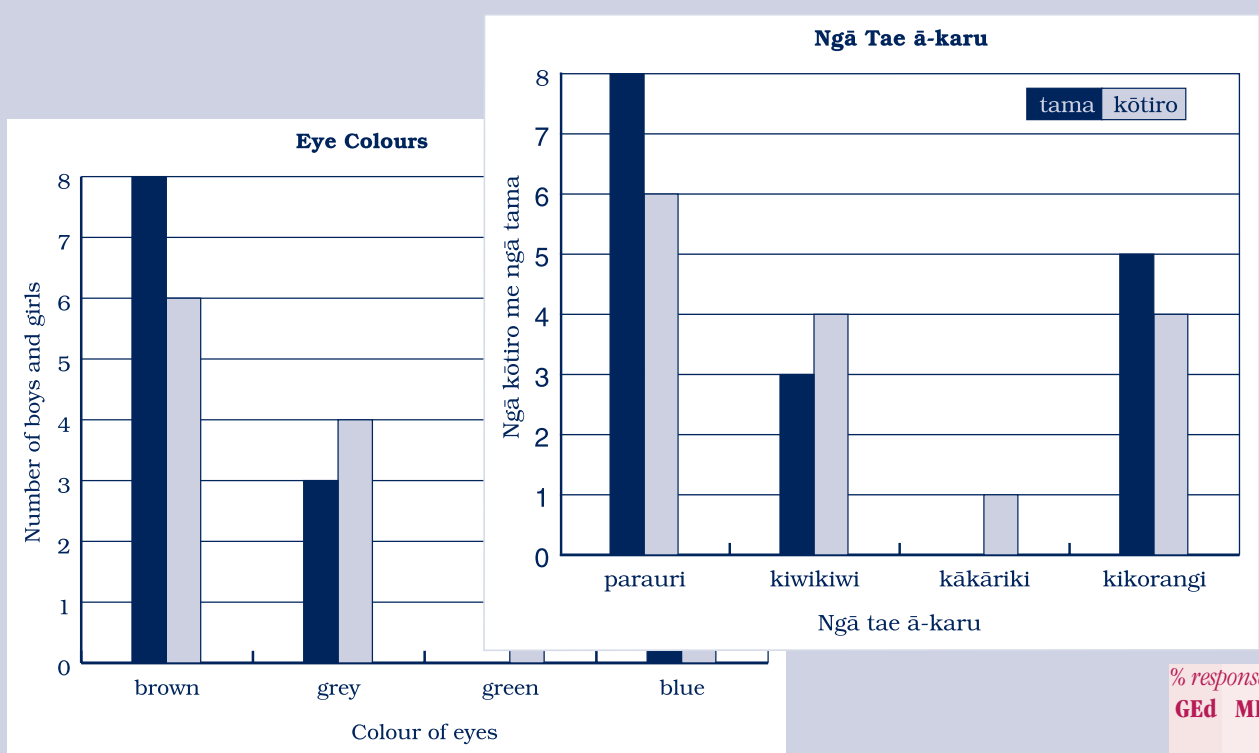
Questions/instructions:

Look at the bar graph called **Eye Colours**. The bar graph shows the different eye colours of boys and girls in Room 3.

Make a table showing eye colours of boys and girls in Room 3.

Tirohia te kauwhata pou o *Ngā Tae ā-Karu*.
E whakaatu ana te kauwhata pou i ngā tae rerekē o ngā karu o ngā tama me ngā kōtiro o te Ruma 3.

Hangaia he ripanga [table] hei whakaatu i ngā tae rerekē o ngā karu o ngā tama me ngā kōtiro o te Rūma 3.

	% responses	
	GEd	**MI**
presented information in a table format	54	45
separate rows or columns for boys and girls	50	26
separate rows or columns for the four eye colours	57	26
all cell numbers correct	41	33

Commentary:

Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

Exemplars:

Kei te Moana — Down at the Sea

Approach: Station
Focus: Using tally marks and creating a bar graph.
Resources: Picture of people gathering kai moana (sea food).

Questions/instructions:

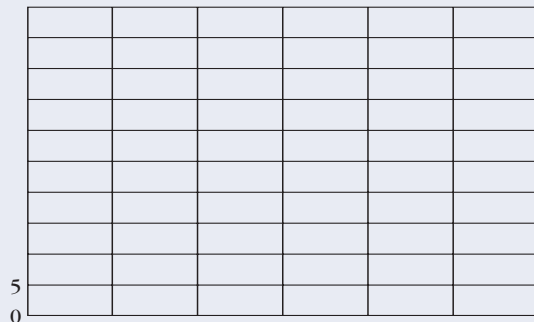On Saturday some children went down to the sea to gather sea food. When they had finished they counted the sea food.

1. Tally marks have been made for sea eggs and for mussels. Make the tally marks for the other sea foods.

SEAFOOD	TALLY
28 sea eggs (kina)	### ### ### ### ### ///
40 mussels	### ### ### ### ### ### ### ###
6 crayfish	### /
5 crabs	###
20 paua	### ### ### ###
2 octopus	//

I te Hatarei ka haere ētahi tamariki ki te kohikohi kaimoana. Ka mutu tā rātou kohikohi ka tatauria ngā kaimoana.

1. Kua tohua ngā <u>tatau</u> [tally] mō ngā kina me ngā kuku. Tohua ngā tatau mō ētahi atu o ngā kaimoana.

		% responses
NGĀ KAIMOANA	NGĀ TATUA	GEd MI
e 28 ngā kina	### ### ### ### ### ///	
e 40 ngā kuku	### ### ### ### ### ### ### ###	
e 6 ngā koura	### /	92 90
e 5 ngā pāpaka	###	92 96
e 20 ngā pāua	### ### ### ###	93 96
e 2 ngā wheke	//	96 96

(bar graph grid with vertical axis labeled 5, 0)

2. Show the information on a bar graph.

   Whakaaturia mai ēnei pārongo ki tētahi <u>kauwhata pou</u> [bar graph].

	% responses
	GEd MI
correct bar height: sea eggs	64 52
mussels	84 81
crayfish	73 58
crabs	82 83
paua	80 88
octopus	76 54

3. Write a name for your graph in the best place.

   Tuhia he ingoa ki te wāhi tino pai mō tō kauwhata.

	% responses
	GEd MI
suitable title given	47 56
title above graph	79 71

4. Write a label on the vertical side or left side of the graph.

   Tuhia he tapanga ki te <u>taha poutū</u> [vertical side], ki te taha mauī rānei o tō kauwhata.

Y axis: title & value labels	45 44
value labels only	43 46

5. Write a label on the horizontal line or bottom of the graph.
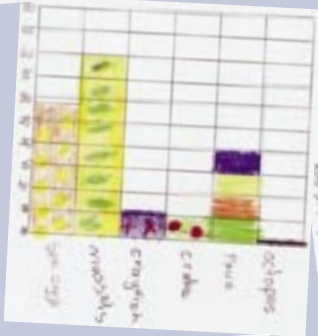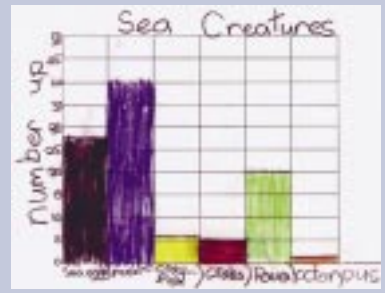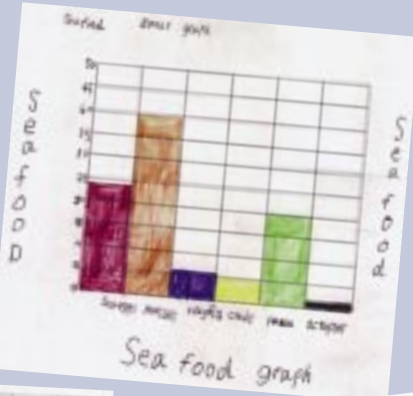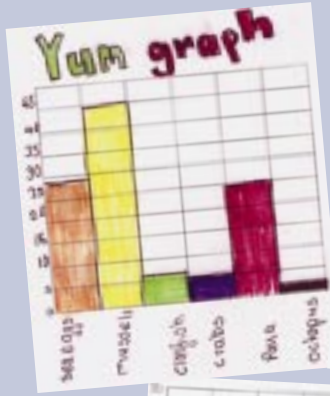
   Tuhia he tapanga ki runga i te <u>huapae</u> [horizontal line] ki raro rānei i tō kauwhata.

X axis: appropriate title	55 56

Commentary:

Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

Exemplars: Year 4: colour pencils or labelled; year 8: black pencils.
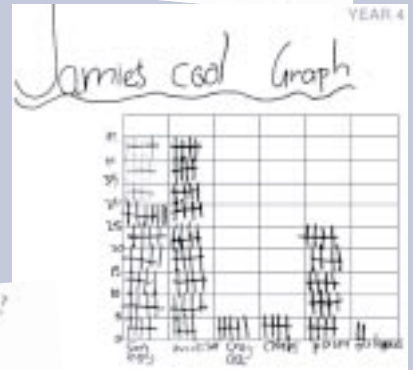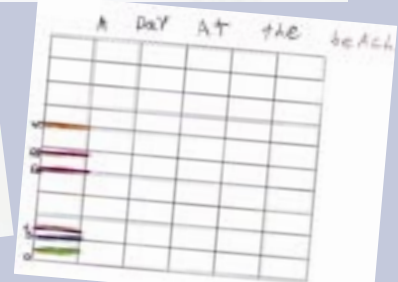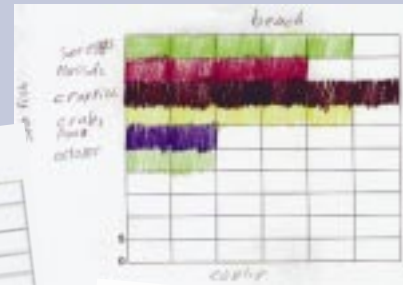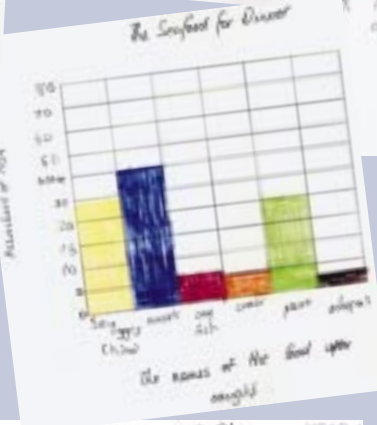
Graphs, Tables and Maps Link Tasks

LINK TASK 2

Approach: Station
Focus: Interpreting a bar graph.
Resource: Laptop computer, mouse, headphones, mousepad, Hypercard® program.

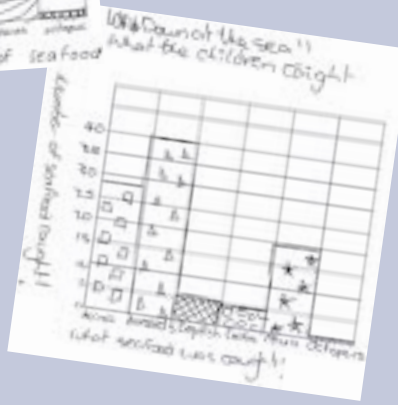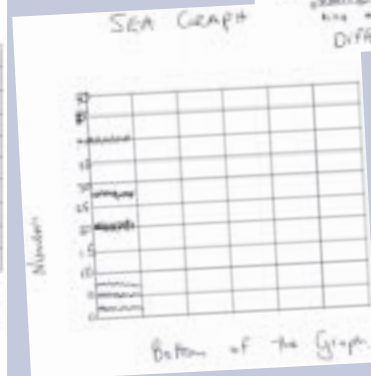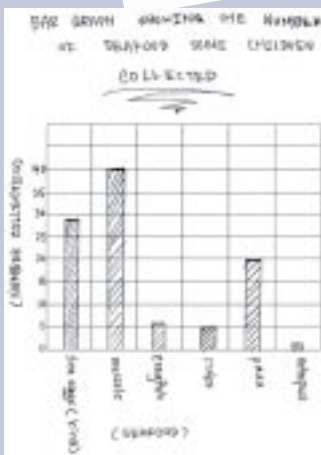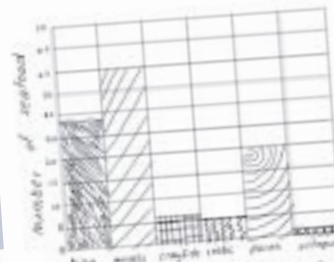|		% responses	
		GEd	**MI**
Question:	1	99	93
	2	74	47
	3	37	58
	4	85	80

Commentary:
Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

LINK TASK 3

Approach: Station
Focus: Interpreting a map.
Resource: Map

		% responses	
		GEd	**MI**
Question:	1	96	88
	2	80	13
	3	62	52
	4	70	75
	5	95	67
	6	84	54
	7	86	42

Commentary:
Overall, MI (Māori Immersion) students scored statistically significantly lower than GEd (General Education) students.

LINK TASK 4

Approach: Station
Focus: Interpreting a map.
Resource: Map

		% responses	
		GEd	**MI**
Question:	1	99	100
	2	51	61
	3	98	100

Commentary:
Overall, MI (Māori Immersion) students scored statistically significantly higher than GEd (General Education) students.

LINK TASK 9

Approach: Station
Focus: Interpreting a table.
Resource: Brochure including table.

		% responses	
		GEd	**MI**
Question:	1	88	96
	2	95	96
	3	96	93
	4	82	83
	5	22	37

Commentary:
Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

LINK TASK 10

Approach: One to one
Focus: Interpreting a table and a graph.
Resource: Table and graph.

	% responses	
	GEd	**MI**
Question: 1	70	71
2	83	75
3	76	67
4	87	53
5	85	49
6	51	16
7	51	62
8	67	24

Commentary:
Overall, MI (Māori Immersion) students scored statistically significantly lower than GEd (General Education) students.

LINK TASK 12

Approach: One to one
Focus: Interpreting a graph.
Resource: Graph

	% responses	
	GEd	**MI**
Question: 1	45	69
2	55	79
3	48	88
4	33	40

Commentary:
Many MI (Māori Immersion) students appeared to receive additional help with this task. Accordingly, statistical comparisons are inappropriate.

LINK TASK 14

Approach: Station
Focus: Constructing a graph.
Resource: 3 sets of objects, ruler.

	% responses	
	GEd	**MI**
Component: 1	83	31
2	94	96
3	91	98
4	76	94
5	45	51

Commentary:
Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

LINK TASK 17

Approach: Station
Focus: Completing a bar graph.
Resource: None

	% responses	
	GEd	**MI**
Component: 1	57	50
2	91	89
3	75	78
4	86	78
5	70	57
6	75	57
7	67	72
8	80	65

Commentary:
Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.

LINK TASK 18

Approach: Station
Focus: Completing a map.
Resource: None

	% responses	
	GEd	**MI**
Component: 1	78	65
2	83	78
3	64	63
4	83	71
5	56	63
6	78	71

Commentary:
Overall, the results obtained by MI (Māori Immersion) and GEd (General Education) students were not statistically significantly different.