

Overarching Question: What important lessons can we learn from science and math that can help us live mino bimaadiziwin?

Overarching Challenge: Use Indigenous knowledge and western knowledge to develop a guide that includes helpful advice for living mino bimaadiziwin. (For example, communicate five important tips or lessons in the format of your choice.)

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?

Lesson Challenge: Compare different ways of organizing information to create a budget that will help you make the best financial decision.

Lesson Summary: In this lesson, you will compare different ways of organizing information to create a budget that will help you make the best financial decision.

Big Idea: Gathering and organizing mathematical information helps us manage everyday problems and respond to them effectively.

Materials: calculator, coloured pencils/pens/highlighters



Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?

Lesson Challenge: Compare different ways of organizing information to create a budget that will help you make the best financial decision.

Start Your Thinking

A family of four is planning to visit Thunder Bay for 2 nights and 3 days. They have a family budget of \$1200 to cover their expenses while there, including accommodations, food, and activities. They also want to make sure they have money left to spend on clothing and household items they need to buy while in the city. Everyone has been thinking of things they want to do while in Thunder Bay. The adults in the family have started a list of possible expenses, including things to do/places to visit and a motel for the stay.

Trip to Thunder Bay—Expenses

- Super 8 Motel for 2 nights: \$458.00 (parking, free high-speed internet, breakfast included, no pool)
- David Thompson Astronomical Observatory, Night Sky Program for 4: \$36
- Cineplex movie night for 4: tickets \$60, snacks \$50
- Art gallery tour: free
- Hiking at Anemki Wajiw (Mount McKay): \$10 (permit)
- Hiking at Kakabeka Falls: \$12.25 (day-use fee)
- Walking tour of Thunder Bay: free
- Shopping: \$200 for clothes and household items
- Lunches and dinners: \$300

How would you organize the information to help the family make a sound financial decision about what activities to do in Thunder Bay?

I would use

- a table
- a graph
- another representation:

Math 9

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?



Use the space below to organize the information using your preferred representation.



Think About the Lesson Challenge

In this lesson, you will compare different ways of organizing information to create a budget to help make the best financial decision.

Good mathematicians organize mathematical information and details so that they can better complete a task, solve a problem, or make comparisons. When you considered how to best organize the details of a budget, did you think like a good mathematician?



Did you think about...

- how to sort the information into helpful groups or categories? For example,
 - did you place all information about accommodations in one category and meals in another?
- how to sort the information in a mathematically meaningful way? For example,
 - did you calculate totals that you can compare to the total budget for the trip?
- how to visually show the information to make it simpler to understand? For example,
 - did you use a clearly labelled table or graph?

Math 9

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?

Grow Your Thinking

The children in the family decide to create a different budget for the trip using both a table and a circle graph. Let's look at each representation and see which one you would find most helpful when making a financial decision about what activities a family can do in Thunder Bay.

Use the chart on the next page to think like a mathematician and consider how well the table

- sorts the information into helpful groups or categories
- sorts the information in a mathematically meaningful way
- visually shows the information to make it simpler to understand

Representation 1: Table

Children's Budget Summary				
Destination: Thunder Bay			Budget: \$1200	
Length of Stay: 3 days and 2 nights				
		Day 1	Day 2	Day 3
Accommodations must provide enough space and amenities that the whole family can enjoy.		<u>Days Inn and Suites</u> for 2 nights: \$515.67 Free parking, high-speed internet, pool and fitness centre, breakfast included		
Food plan for family	Breakfast	at home	included	included
	Lunch	\$50	\$50	\$50
	Dinner	\$80	\$100	at home
Super-fun activities are entertaining and engaging for the whole family.		David Thompson Astronomical Observatory, Night Sky Program \$36 (4 people)	Movie Night \$110 (4 people)	Splish Splash Water Park \$23/person for 2 hours
Shopping		\$50	\$50	\$0
Total				\$1183.67

Math 9

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?



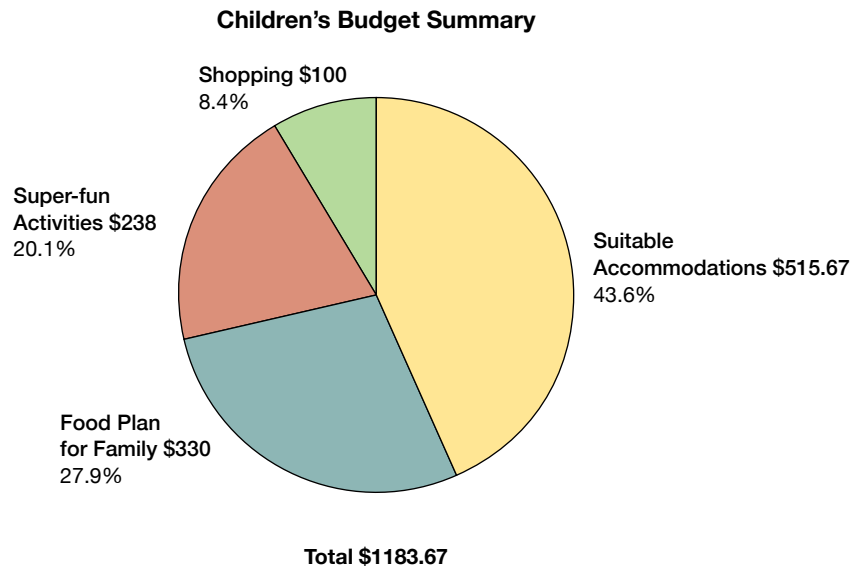
Criteria	Evidence for...	Evidence against...
<ul style="list-style-type: none"> Sorts the information into helpful groups or categories 		
<ul style="list-style-type: none"> Sorts the information in a mathematically meaningful way 		
<ul style="list-style-type: none"> Visually shows the information to make it simpler to understand 		

How helpful is the table for making financial decisions about what activities to do in Thunder Bay? Place an X on the scale to show your thinking.

Not at all helpful
Somewhat helpful
Very helpful

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?

Representation 2: Circle Graph



Criteria	Evidence for...	Evidence against...
<ul style="list-style-type: none"> Sorts the information into helpful groups or categories 		
<ul style="list-style-type: none"> Sorts the information in a mathematically meaningful way 		
<ul style="list-style-type: none"> Visually shows the information to make it simpler to understand 		

How helpful is the circle graph for making financial decisions about what activities to do in Thunder Bay? Place an X on the scale to show your thinking.



Which representation, the table or the circle graph, do you think is most helpful?

The most helpful representation is _____
because...

Math 9

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?

Pull Your Thinking Together

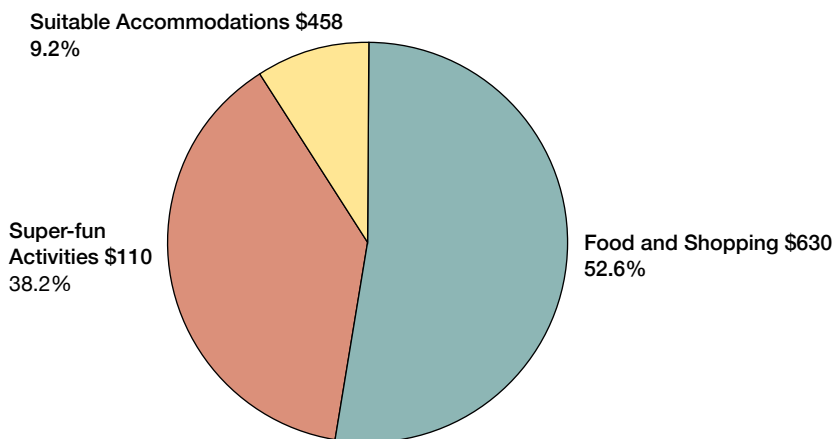
The adults in the family created this budget to match the list on page 2. They represented it in a table and in a circle graph. However, you notice that the information in the circle graph has *not* been organized and represented effectively.

Adults' Budget Summary				
Destination: Thunder Bay			Budget: \$1200	
Length of Stay: 3 days and 2 nights				
		Day 1	Day 2	Day 3
Suitable accommodations must provide adequate space and amenities that the whole family can enjoy.		Super 8 Motel for 2 nights		
		\$458.00 Parking, free high-speed internet, breakfast included No pool		
Food plan for family	Breakfast	at home	included	included
	Lunch	\$50	\$50	\$50
	Dinner	\$100	\$100	at home
Super-fun activities are entertaining and engaging for the whole family.		Tour of Art Galleries free	Movie Night \$110 (4 people)	Walk Around Thunder Bay free
Shopping		\$50	\$150	\$80
Total				\$1198

Math 9

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?

Adult's Budget Summary



Total \$1198

Use the criteria to assess how the information in the table has been misrepresented in the circle graph.



Criteria	Evidence for...	Evidence against...
<ul style="list-style-type: none"> Sorts the information into helpful groups or categories 		
<ul style="list-style-type: none"> Sorts the information in a mathematically meaningful way 		
<ul style="list-style-type: none"> Visually shows the information to make it simpler to understand 		

What are your suggestions for how to fix the circle graph?

Math 9

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?

Practise the Thinking

A group of friends are planning a weekend trip to a nearby cottage resort with lots of amenities. They have a budget of \$1000 for four people. Use the list of expenses below to complete the table and select which activities the friends could choose to stay within their budget.

Then, check the accuracy of your table using the circle graph on the next page.

Expenses

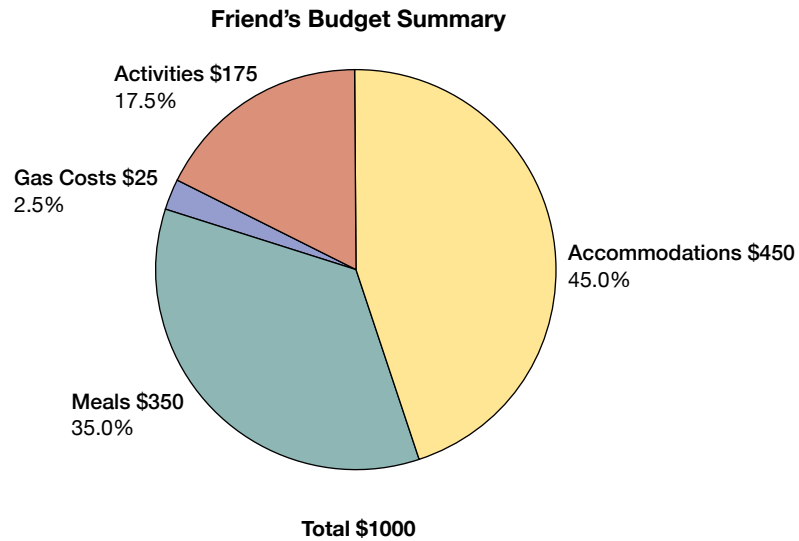
- Cottage rental (3 days, 2 nights; breakfast included): \$450
- Lunch: \$50 per day (for 4 people)
- Dinner: \$100 per day (for 4 people)
- Water park access: \$25 day pass per person
- Boat rental: \$50 per day
- Mini golf: \$6.25 per person
- ATV rentals: \$20 per person
- Bicycle rentals: \$5 per person
- Gas: \$25 round trip



Friends' Weekend Budget				
Destination: Sunset Bay			Budget: \$1000	
Length of Vacation: 3 days and 2 nights			Transportation: Car (owned by a friend)	
		Day 1	Day 2	Day 3
Accommodations must provide adequate space and amenities that the friends can enjoy.				
Meals	Breakfast			
	Lunch			
	Dinner			
Activities				
Gas costs				
Total				\$1000

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Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?



Use the criteria to help you identify any improvements you could make to your table.



Criteria	Evidence for...	Evidence against...
<ul style="list-style-type: none"> Sorts the information into helpful groups or categories 		
<ul style="list-style-type: none"> Sorts the information in a mathematically meaningful way 		
<ul style="list-style-type: none"> Visually shows the information to make it simpler to understand 		

How helpful is the table for making financial decisions? Place an X on the scale to show your thinking.



What improvements would you make to your table?

Lesson Question: What is the best way to represent information to help you make financial decisions: a table or a graph?



Reflect on Your Thinking

Think About the Lesson Challenge

In this lesson, you compared different ways of organizing information to create a budget to help make the best financial decision possible. Look back to the start of the lesson and your initial decision on page 2.



What representation would you *now* use to help the family make a financial decision?

I would use

- a table
- a graph
- another representation:

because...

Did your thinking change from the start of the lesson to the end of the lesson? Why?

Think About the Overarching Challenge

If you completed the launch lesson (“What lessons can we learn from science and math that can help us live *mino bimaadiziwin?*”), you probably started a Thoughtbook. In this Thoughtbook, you began thinking about ways to respond to the challenge: **Begin creating helpful advice for living *mino bimaadiziwin*.**

After you’ve finished the math lessons, you’ll use what you’ve learned to respond to that challenge. You can use the format of your choice—a song, a traditional art form, photographs, a poem, whatever you think would be best—to describe the actions we can take to live in a good way with the land.

Revisit your Thoughtbook now, and think about what you’ve learned in this lesson:

- What actions would you add to your Thoughtbook?
- Would you change any of the ideas that you already have in your Thoughtbook?

If you haven’t already started a Thoughtbook, you can answer these questions on page 13.

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To complete this lesson, take a moment to reflect on your learning.



Success Criteria	How well am I doing?
I can sort the information into helpful groups or categories.	<div style="display: flex; justify-content: space-between; align-items: center;"> 1 2 3 4 </div> <hr style="border: 1px solid black; margin: 5px 0;"/> <div style="display: flex; justify-content: space-between;"> I'm still working on it I've got it </div> <p>Examples that support my rating:</p>
I can sort the information in a mathematically meaningful way.	<div style="display: flex; justify-content: space-between; align-items: center;"> 1 2 3 4 </div> <hr style="border: 1px solid black; margin: 5px 0;"/> <div style="display: flex; justify-content: space-between;"> I'm still working on it I've got it </div> <p>Examples that support my rating:</p>
I can visually show the information to make it simpler to understand.	<div style="display: flex; justify-content: space-between; align-items: center;"> 1 2 3 4 </div> <hr style="border: 1px solid black; margin: 5px 0;"/> <div style="display: flex; justify-content: space-between;"> I'm still working on it I've got it </div> <p>Examples that support my rating:</p>

Math 9

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My Thoughtbook: What lessons can we learn from science and math that can help us live mino bimaadiziwin?



Use words, symbols, or pictures to describe three pieces of helpful advice that we can learn from science and math that could help us live mino bimaadiziwin.