Analysing Graphs of Linear Relations

Suggested Timing
100–120 minutes

Materials
• cardboard circle
• coloured counters
• square tiles

Blackline Masters
BLM 9–3 Chapter 9 Warm-Up
BLM 9–5 Section 9.1 Extra Practice
BLM 9–6 Section 9.1 Math Link

Mathematical Processes
☑ Communication (C)
☐ Connections (CN)
☑ Mental Mathematics and Estimation (ME)
☑ Problem Solving (PS)
☑ Reasoning (R)
☑ Technology (T)
☑ Visualization (V)

Specific Outcomes
PR1 Graph and analyze two-variable linear relations.

Category	Question Numbers
Essential (minimum questions to cover the outcomes)	1, 3, 4, 6, 9, Math Link
Typical	1, 3, 4, 6, 8–13, Math Link
Extension/Enrichment	1, 3, 13–18

Planning Notes

Have students complete the warm-up questions on **BLM 9–3 Chapter 9 Warm-Up** to reinforce material learned in previous sections.

As students examine and discuss the hieroglyphics photo, remind them that graphs and hieroglyphics are ways to tell a story. Ask students questions such as
• How do graphs tell a story?
• How are graphs and hieroglyphics similar? different?

Literacy Link Read the Literacy Link on page 332 with students. Invite students to share what they remember about relationships from their work in grade 7.

Explore the Math

In this exploration, students examine the cost of pizzas according to the number of toppings. In #4a), students are asked to identify three ways of representing data. Some students may be able to identify four methods:
• in words
• with a graph
• using a concrete model
• in a table of values

Note that the cardboard circles should have an approximate radius of 5 cm.

Method 1 Divide the class into groups of three and have them work through the exploration and questions together. Once they have completed the steps, have each group compare their results with those of another group.

The graph shows the cost of Tony's medium pizzas.

Cost of Tony's Pizzas

On the graph, t represents the number of extra toppings and C represents the cost in dollars.

1. a) Use a cardboard circle and coloured counters to model a medium pizza with extra cheese, pineapple, and ham.
b) Explain how your model could represent the cost of a medium pizza with three toppings. What cost does your model show?

Strategies
Model It

2. Look at the graph. What is the cost of a medium pizza with three toppings? How does this compare with your answer in #1b)?

3. a) From the graph, make a table of values that shows the cost of a medium pizza with zero to six toppings.
b) What headings did you use for your table? Why?

Literacy Link
A *table of values* is a chart showing two sets of related numbers.

Reflect on Your Findings

4. a) What are three ways you can represent data?
b) Which way do you prefer? Why?

You can arrange a table of values horizontally or vertically. In a horizontal table, the top row should show the x-coordinates from a graph.

x	1	2	3	4
y	5	10	15	20

In a vertical table, the first column should show the x-coordinates from a graph.

x	y
1	5
2	10
3	15
4	20

Example 1: Make a Table of Values From a Graph

The graph shows the total cost in relation to the number of baseballs you buy.
a) Describe patterns you see on the graph.
b) Make a table of values from the graph.
c) If the relationship continues, what is the cost of 14 baseballs?

Tech Link
You can use a spreadsheet program to create a table.

Cost of Baseballs

Solution
a) The patterns can be described in the following ways:
• The graph provides data on the cost of baseballs. One ball costs $3, two balls cost $6, three balls cost $9, …
• The points appear to lie in a straight line.
• The graph shows that to move from one point to the next, you go one unit horizontally and three units vertically.

Cost of Baseballs

b)

Number of Baseballs, b	1	2	3	4
Total Cost, C ($)	3	6	9	12

Strategies
Solve an Equation

c) The graph shows that the cost increases by $3 for each baseball purchased. Let b represent the number of baseballs. The cost could be represented by $3b$.

$$\text{Cost of 14 baseballs} = 3(14)$$
$$= 42$$

The cost of 14 baseballs is $42.

Show You Know
The graph shows the number of triangles in relation to the figure number in a pattern.
a) Describe patterns you see on the graph.
b) Draw a triangle pattern that matches the graph.
c) Make a table of values from the graph.
d) If the pattern continues, how many triangles are in Figure 99?

Triangles in a Pattern

Method 2 Divide the class into four groups and have each group represent the data about Tony's Pizzeria using one of the four methods (see bulleted list on previous page). Have each group share their results, explaining what they did and how their method shows the data. As a class, discuss which methods are more effective and less effective for representing this particular data and why.

Literacy Link Direct students' attention to the Literacy Link on page 333. Also, discuss the thought bubble on that page, which gives more information about tables of values.
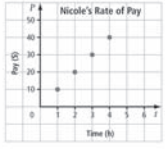
Example 1

Example 1 leads students to look at the information on a graph in several ways and identify different patterns on the graph.

The activity includes making a table of values from the graph. Students must understand that tables of values can be arranged vertically or horizontally. They should also realize that the data from each axis of the graph must be placed in specific positions in a table of values. Make sure that all students understand this convention. As practice, you might want to give a graph and ask students to create a horizontal or vertical table of values for that graph.

Part c) requires students to continue the pattern shown on the graph. Students could find the answer by extending the graph or by determining an expression for cost in terms of the number of baseballs.

Example 2

This example is similar to Example 1 and reinforces the skills introduced there. Part d) is included to get students thinking about whether it is possible, from a common sense perspective, to have points between those shown on the graph. This is not intended as a formal study. Students are not expected to understand discrete and continuous variables but rather simply to identify an argument for or against additional points. This may help them to understand the information that is available from the graph.

Literacy Link With students, read the Literacy Link on page 335. Students studied linear equations in grade 7, so they may recall that linear relations result in a graph that lies along a straight line. Have them share examples of linear equations that they remember from prior learning.

Meeting Student Needs

• Have students work through Example 1 in pairs. After they feel confident, students should individually try the Show You Know, checking their responses against those of their partner.
• Teach this section over two periods, focusing on one example in each period. Give an additional set of questions with each example.
• If students have difficulty remembering what the term *linear relation* means, point out to them that *linear* contains the word *line*.
• Have students work with data that relates to something that they are familiar with. For example, show students a picture of a beaded article, such as a traditional Inuit parka, and have them make a table of values relating the number of red beads to the number of blue beads.

ELL

• Explain the following terms in context: *pictorial writings*, *tombs*, *relationships*, *sets of data*, *toppings*, *headings*, *triangles*, *part-time*, and *hourly rate of pay*.
• Have students list a variety of different pizza toppings so that English language learners understand what the graph is about.
• For the Show You Know activities, allow English language learners to write their ideas in their first language, and then discuss them in English orally using visuals. You may also wish to give them a word bank that includes words such as *increasing*, *horizontally*, and *vertically*.

Common Errors

• Some students may reverse the order of the *x*-coordinates and *y*-coordinates when making their table of values.

R$_x$ Remind students that the first coordinate in an ordered pair is the *x*-coordinate or horizontal coordinate. It should always be placed in the first column or row of the table. The second coordinate is the *y*-coordinate or vertical coordinate.

• Some students may incorrectly describe patterns on a graph.

R$_x$ Remind students that when you describe a pattern, you tell what it relates to, where it starts, and how it changes.

Answers

Explore the Math

1. a) Answers may vary.

   b) Answers may vary. Example: The pizza costs $9 and each of the three toppings that are represented cost $1, which makes a total of $12. The cost shown by the model is $12.

2. The cost of a medium pizza with three toppings is $12. Answers may vary. Example: The cost is the same as the answer in #1b).

3. a)

Number of Toppings	Cost ($)
0	9
1	10
2	11
3	12
4	13
5	14
6	15

   b) Answers may vary. Example: I used the headings Number of Toppings and Cost because they were used on the graph.

4. a) Answers may vary. Check that students identify three of four possible ways to represent data: on a graph, with a concrete model, in a table of values, with words.

   b) Answers may vary. Example: I prefer a graph because you can see the patterns on the graph.

Show You Know: Example 1

a) Answers may vary. Example: The graph provides data on the number of triangles in a pattern. Figure 1 has three triangles, Figure 2 has six triangles, Figure 3 has nine triangles, … . The points appear to lie in a straight line. The graph shows that to move from one point to the next, you go one unit horizontally and three units vertically.

b) Answers may vary. Example:

Figure 1   Figure 2   Figure 3   Figure 4
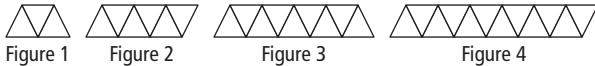
c)

Figure Number	Number of Triangles
1	3
2	6
3	9
4	12

d) 297

Show You Know: Example 2

a) Answers may vary. Example: The graph provides data on the cost of notebooks. The cost of one notebook is $2, the cost of two notebooks is $4, the cost of three notebooks is $6, … . The points appear to lie in a straight line. The graph shows a linear relation. To move from one point to the next on the graph, you go one unit horizontally and two units vertically.

b) The cost per notebook is $2. Answers may vary. Example: The cost for any number of notebooks is $2 times the number of notebooks

c)

Number of Notebooks	Cost ($)
1	2
2	4
3	6
4	8

d) Answers may vary. Example: No, it is not possible to have points between the ones on the graph. You can only buy a whole number of notebooks.

Assessment	Supporting Learning
Assessment *as* Learning	
Reflect on Your Findings Listen as students discuss what they discovered during Explore the Math. Try to have students explain what is most important in the activity and generalize the conclusions about their findings.	• Show students that the steps they completed in the Explore the Math will help them to answer #4a). How is the information presented in the question? (In words) What way is used to represent the data in question #1a)? (Cardboard model) In #2? (Graph) In #3a)? (Table of values) • Students should feel comfortable with all three formats: graphs, tables, and models. Some students may benefit from verbalizing what is different about each format. • In #4b), encourage students to take a position and support it in some way. Remind students that their position can change depending on the situation. • In their groups, have students share and discuss the responses to #4b) with the class. It may be beneficial to discuss the advantages and disadvantages of each. This discussion may assist students who are still uncertain about one of the formats.
Assessment *for* Learning	
Example 1 Have students do the Show You Know related to Example 1.	• Encourage students to verbalize their thinking. • You may wish to have students work with a partner. • Encourage alternative wordings for describing the patterns formed on a graph. • Ensure that all students use the correct labels for rows and columns in their tables of values and that the labelling is based on the axes of the graph. • Refer students to Example 1, which provides a similar question pattern. • Some learners may find it beneficial to verbalize the pattern in the graph. Ask them questions such as "How do you get from one point to the next?" • Having some students draw or model the triangle pattern may help them to describe the pattern and lead them to determine the answer to part d). • Students may find it helpful to use the class responses as springboards to prepare their own answers.
Example 2 Have students do the Show You Know related to Example 2.	• Encourage students to verbalize their thinking. • You may wish to have students work with a partner. • Allow students to use manipulatives, such as square tiles or coloured counters, to model the situation. • Suggest that students use a different layout for their table of values from what they used in Example 1. • If students have difficulty with part b), remind them that *cost per notebook* is found by determining the value of the second or vertical coordinate when the first or horizontal coordinate is 1. • It may be beneficial to discuss the response to part d) with the entire class. Have students generate further examples of when it would and would not be appropriate to use points between those on the graph. Some learners may benefit from making a list of the suggestions in their Foldable.

Key Ideas

- You can use the coordinates of the points on a graph to make a table of values.
- The top row or left column in a table of values has the same label as the horizontal axis. The second row or right column has the same label as the vertical axis.

Time Worked, t (h)	1	2	3
Pay, P ($)	12	24	36

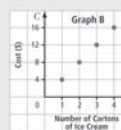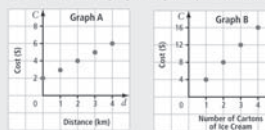| Time Worked, t (h)	Pay, P ($)
1	12
2	24
3	36

Pay Received for Time Worked
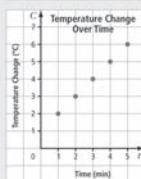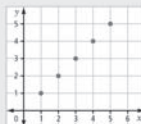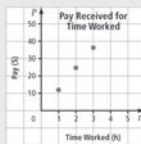
- When you describe a pattern, tell what it relates to, where it starts, and how it changes.
- A linear relation is a pattern made by a set of points that lie in a straight line.

- Sometimes, it is possible to have points between the ones on a graph. Ask yourself, "Does it make sense to have other values between those on the graph?"

Could there be points between the ones on the graph? For example, is it possible to determine the temperature at $2\frac{1}{2}$ min?
Is it possible to read a temperature as part of a degree, such as 3.5 °C?

Temperature Change Over Time

Communicate the Ideas

1. Tell whether you think it is reasonable to have points between the ones on each graph. Explain your answer.
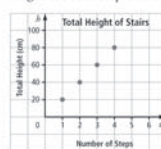
Graph A

Graph B

2. Draw a graph of a linear relation. Use integer values only. Label your graph. Write a brief description that matches the information on your graph.

3. Use an example to show one way that a graph and a table of values are different and one way that they are similar.

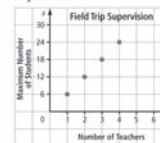## Check Your Understanding

Practise

For help with #4 and #5, refer to Example 1 on page 334.

4. The graph shows the increase in total height for each step of a staircase.

Total Height of Stairs

a) Describe patterns you see on the graph.
b) Make a table of values from the graph.
c) If the pattern continues, what is the total height on step 10?

5. The graph shows the maximum number of students allowed on a field trip based on the number of teachers available to supervise.

Field Trip Supervision

a) Describe three patterns on the graph.
b) Make a table of values from the graph.
c) If there are eight teachers available for a field trip, what is the maximum number of students who can go?

Key Ideas

The Key Ideas provide a detailed summary of what is most important in section 9.1. Have students prepare their own summary of the Key Ideas and record them in their chapter Foldable. Encourage them to use different examples from the ones in the student resource.

Communicate the Ideas

Have students work individually or in small groups to answer the questions. In #1, students indicate whether they think it is reasonable to have points between those provided on two different graphs. This question requires an interpretation of what each graph is about.

For #2, students make a graph of a linear relation and then must come up with a description that matches their graph.

In #3, students are asked to show one way that a graph and a table of values are similar and one way that they are different.

Meeting Student Needs

- Students should be discouraged from copying the Key Ideas and should limit their summary to what is important to them and/or what they are less familiar or comfortable with.

ELL

- For #1 of Communicate the Ideas, make sure that English language learners understand that *carton* is a word for the container/box that ice cream comes in.

Answers

Communicate the Ideas

1. Answers may vary. Example: It is reasonable to have points between the ones on Graph A since it is possible to travel distances that include a part of a kilometre. It is not reasonable to have points between the ones on Graph B since it is not possible to buy part of a carton of ice cream.

2. Answers may vary. Example: The graph shows the cost of tickets to the school dance.
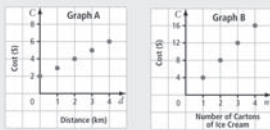

Cost of Tickets for School Dance
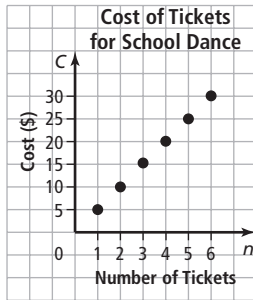
3. Answers may vary. Example: A graph and a table of values are different because the graph shows a picture of the data, which can help to determine a pattern, whereas the table of values does not. A graph and a table of values are similar because the values in the table are represented by the points on the graph. The graph from #2 shows the same data as the following table of values:

Number of Tickets	Cost ($)
1	5
2	10
3	15
4	20
5	25
6	30

Assessment	Supporting Learning
Assessment *as* Learning	
Communicate the Ideas Have all students complete #1 and #3. Check student responses for conceptual understanding.	• Consider having students work in pairs or groups. • Check each student's answer to #1. If students find this question challenging, encourage them to look at Graph B first, remind them that values between those given would be fractional, and ask them to think about whether you can buy part of a carton of ice cream. • Have students share their answers to #3 in a class discussion.

1. Tell whether you think it is reasonable to have points between the ones on each graph. Explain your answer.
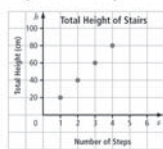
Graph A

Graph B

2. Draw a graph of a linear relation. Use integer values only. Label your graph. Write a brief description that matches the information on your graph.

3. Use an example to show one way that a graph and a table of values are different and one way that they are similar.
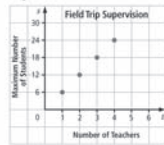
Check Your Understanding

Practise

For help with #4 and #5, refer to Example 1 on page 334.

4. The graph shows the increase in total height for each step of a staircase.

Total Height of Stairs

a) Describe patterns you see on the graph.
b) Make a table of values from the graph.
c) If the pattern continues, what is the total height on step 10?

5. The graph shows the maximum number of students allowed on a field trip based on the number of teachers available to supervise.

Field Trip Supervision

a) Describe three patterns on the graph.
b) Make a table of values from the graph.
c) If there are eight teachers available for a field trip, what is the maximum number of students who can go?

For help with #6 and #7, refer to Example 2 on page 335.

6. Tessa and Vince go shopping at Bulk Bin. The graph shows the cost of banana chips.

Cost of Banana Chips at Bulk Bin
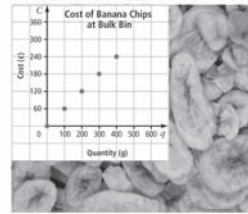
a) Describe patterns shown on this graph. Does the graph show a linear relation? Explain.
b) Make a table of values from the graph.
c) Is it reasonable to include a point on the graph that shows the cost of 250 g of banana chips? Explain.

7. The graph shows the height of a stack of cubes in relation to the number of cubes.

Stack of Cubes
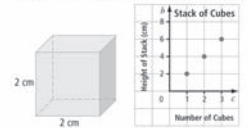
a) Describe patterns on the graph. Does the graph show a linear relation? Explain.
b) Make a table of values from the graph.
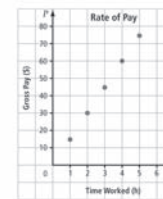c) Is it reasonable to include a point for $c = 2.5$? Explain.

Apply

8. a) Make a table of values for the ordered pairs on the graph.

b) Assume the pattern continues. Extend your table, using the next three whole number values for x.
c) Describe the patterns on the graph.
d) What is the value of y when the value of x is 9?

9. The graph shows the rate of pay based on the number of hours worked.

Rate of Pay

a) Make a table of values from the graph.
b) What is the hourly rate of pay shown on this graph?
c) Do you think it is reasonable to include a point for $t = 3.5$ h?

Check Your Understanding

Practise

Students may be given a choice between #4 or #5 and #6 or #7 since these pairs of questions are similar. Ask students which questions they selected and why.

Students may work individually or in pairs on the questions in the Practise.

Apply

The Apply questions provide a range of contexts for the graphs of linear relations. Select questions based on whether the context is of interest or familiar to students. Also, let students have some choice in the questions they will complete. For example, assign #9, #10, and #14, and then have students select two additional questions from those remaining.

Literacy Link The Literacy Link on page 339 will help students recall how to determine the perimeter of a square, which will assist them in understanding Apply #12. You might have students draw on grid paper a few of the other squares in the table that accompanies #12. This way, they can model that a square with a side length of 2 cm has a perimeter of 8 cm, a square with a side length of 3 cm has a perimeter of 12 cm, etc.

Extend

Both Extend questions provide a graph showing data for two individuals. In #17, students are asked to determine where the lines of points will meet. In #18, students are asked questions about when each individual's money reaches a specified level. This requires students to extend the graphs or use other strategies to determine the answers.

10. The graph shows part of a linear relation that represents the cost to purchase sugar flowers for a cake.


Cost of Flowers
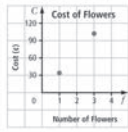
a) Is it reasonable to have points between the ones on the graph? Explain your answer.
b) How many points could there be between the two shown on the graph? Explain your answer.

11. The graph shows the simple interest for one year at 5% for different dollar amounts invested.

Annual Interest at 5%
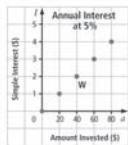
a) What are the coordinates for point W?
b) What does each coordinate for point W represent?
c) Describe patterns on the graph.
d) If the pattern continues, what is the simple interest earned on $180 after one year?

12. The graph shows the perimeter of a square in relation to the length of its side.

Perimeter of Squares
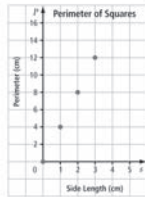
a) Copy the table and fill in the missing values for s and P.

| Side Length, s (cm)	Perimeter, P (cm)
0	0
1	4
2	
	12
4	
5	
	32
28	
	124

b) Describe the patterns on the graph.
c) Are any other points possible between those shown on the graph? Explain.
d) Does the graph represent a linear relation? Explain.

Literacy Link

Perimeter of a Square
$P = 1 + 1 + 1 + 1$
$P = 4$
The perimeter is 4 cm.

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**13.** The graph shows the cost of dried apricots at Bulk N Save.
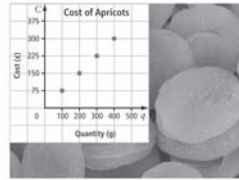
Cost of Apricots

a) Make a table of values from the graph.
b) Describe patterns on the graph.
c) Use the graph to estimate the cost of 350 g of dried apricots.
d) What is the actual cost of 350 g of dried apricots? Round your answer to the nearest cent.
e) Compare your answers in parts c) and d).

14. The graph below represents the relationship between the number of boxes of almonds a student sells for a school fundraiser and the profit in dollars for the school.

School Fundraiser Profits
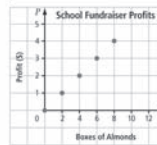
a) Make a table of values from the graph.
b) Describe three patterns on the graph.
c) How much profit does the school make on two boxes of almonds?
d) What is the value of P when the value of b is 2? How does this answer relate to your answer in part c)?

15. The following graph represents the number of words Tom can type in relation to the time in minutes.
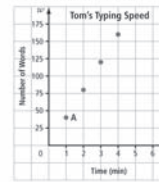
Tom's Typing Speed

a) For the ordered pair (2, 80) tell what each coordinate represents.
b) What is the typing speed in words per minute for point A?
c) Does this graph represent a linear relation? Explain.
d) Would most people's typing speed result in a linear graph? Explain.

16. Alena gathered data comparing the amount of time she spent studying for her tests and the marks she received.

Test Score Based on Study Time
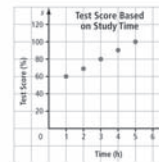
a) Make a table of values from this graph.
b) Does the graph appear to be a linear relation? Why?
c) Will Alena's scores continue increasing at this same rate with more and more time spent studying? Why?

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Web Link

Meeting Student Needs

- Providing choices in what questions students will complete helps them take responsibility for their learning and may improve their attitude toward mathematics.
- Encourage all students to use materials to model the situation depicted on a graph. This helps develop a connection between a real-life situation and the graph or table of values.

- It may be better for your class to have students work in pairs to complete the Practise questions for Example 1 immediately after working on that example. Follow the same procedure for Example 2. Then, have students complete the Apply activities independently after the Example 1 and 2 work is completed.
- For Practise #5b), some students may need assistance in understanding that the values for t are found on the horizontal axis.
- For Apply #8d), some students may need assistance in recalling their work with ordered pairs in grade 7.
- Provide **BLM 9–5 Section 9.1 Extra Practice** to students who would benefit from more practice.

ELL

- For Apply #10, you may need to help some students to understand what sugar flowers are and what they are used for. Point them out in the photo in the student resource.

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Extend

17. At Ciao Restaurant, Mario works in the kitchen for $10 an hour. Susie works as a server. She gets $30 monthly clothing allowance plus $8 an hour.

Rates of Pay for Mario and Susie
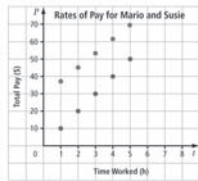
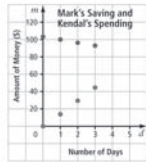**a)** Which colour of points provides information about Susie's wages?

b) Make a table of values with three columns showing Time Worked (h) and Total Pay ($) for Susie and Mario.

c) If the pattern continues, at what point will the two sets of points meet?

18. Mark begins saving $15 a day to buy a three-month gym membership for $90. Kendal has $105 in the bank and spends $5 a day to go to the gym. The graph shows how much money they have over the first three days.

Mark's Saving and Kendal's Spending

a) Which colour of points provides information about Mark?

b) When will Kendal run out of money?

c) When will Mark have saved enough money to buy the membership?

MATH LINK

Whatever adventure you are looking for, it can be found in Western and Northern Canada. Adventures include polar bear tours in Churchill, Manitoba, aurora borealis adventures in the Northwest Territories, and white-water rafting in Yukon Territory.

You are going on a polar bear adventure tour. The graph shows the cost of the trip.

a) Describe any patterns on the graph.

b) Make a table of values from the graph.

c) Assume the pattern continues. Extend your table of values to include the cost of a tour for eight days.

d) Suppose it is possible to upgrade to better accommodations for a one-time fee of $300 plus the regular $400 per day. Make a new table of values for deluxe tours that last from one to eight days.

e) Compare the data in the two tables of values. How are they similar? How are they different?

Polar Bear Adventure

9.1 Analysing Graphs of Linear Relations • MHR **341**

Common Errors

- Some students may describe a pattern incorrectly.
- R_x Emphasize a three-step approach:
  - What is the pattern about?
  - Where does it begin?
  - How does it change from one item to the next?
- Some students may extend patterns incorrectly.
- R_x Reinforce that each element in a pattern is generated from the previous one but that it may be necessary to look at three or more consecutive items in the pattern.

Answers

Math Link

a) Answers may vary. Example: The cost of the polar bear adventure tour increases $400 for every extra day of the adventure. The points appear to lie in a straight line. To move from one point to the next on the graph, you go 1 unit horizontally and 400 units vertically.

b), c)

Number of Days	Cost ($)
0	0
1	400
2	800
3	1200
4	1600
5	2000
6	2400
7	2800
8	3200

d)

Number of Days	Cost ($)
0	300
1	700
2	1100
3	1500
4	1900
5	2300
6	2700
7	3100
8	3500

e) Answers may vary. Example: The data in the two tables of values are similar because the rate of increase for both tables of values is $400 per day. The data in the two tables of values are different because the starting value for the first table is (0, 0) and the starting value for the second table is (0, 300).

Assessment	Supporting Learning
Assessment *for* Learning	
Practise and Apply Have students do #4, #6, and #9. Students who have no problems with these questions can go on to the remaining Apply questions.	• Students who find #4 and #6 challenging will need additional coaching with Examples 1 and 2. Coach students through #4 and #6 and then have them complete #5 and #7. Check back with students to make sure that they are more confident in their understanding. • Encourage students to use concrete materials, such as square tiles or coloured counters, to model what is shown on the graphs. This will help students to understand what the graph is telling them. • Some students may benefit from orally describing the graphs. Copying the graphs and drawing in the vertical and horizontal moves may also assist some learners to identify the pattern. As they draw the moves, have them verbalize their thinking. • Students who find #9 challenging should employ similar strategies as listed above. Have students verbalize when it is appropriate to use values between points before they attempt to answer part c).
Math Link The Math Link on page 341 is intended to help students work toward the chapter problem wrap-up titled Wrap It Up! on page 363.	• It is not necessary for students to do the Math Link. However, it may be beneficial for some students to complete it as it relates to the Wrap It Up! at the end of the chapter. • Reinforce that the Math Link is mathematically identical to both Examples 1 and 2 but simply involves a different situation. • Students who need help getting started could use **BLM 9–6 Section 9.1 Math Link**, which provides scaffolding for this activity.
Assessment *as* Learning	
Math Learning Log Have students respond to the following prompts: • How are graphs and tables of values similar and different? • I can get the following information from a graph …	• Encourage students to select an example of a table of values and accompanying graph from section 9.1 and use it to help identify similarities and differences. • Encourage concrete and kinesthetic learners to use manipulatives to model graphs. • Depending on students' learning styles, have them provide oral or written answers. • Encourage students to look back over their work for ideas to help them answer the questions. • Encourage students to use the What I Need to Work On section of their chapter Foldable to note what they continue to have difficulties with.