**Financial Literacy Lesson Plan**

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| **Connections to Financial Literacy**   * *Consumer protection and awareness as students consider the actual cost of installment purchases and service contracts;* * *Understanding needs and wants as students reflect upon the appropriateness of purchasing by installment or service contracts.* | | |
| **Unit 1: Day 1: How Much Will It Really Cost?** | | **Subject/Course**  **MPM 1D Principles of Mathematics**  **Grade 9 Academic**  **MFM 1P Foundations of Mathematics Grade 9 Applied** |
| Curriculum Expectations | | Learning Goals |
| **Linear Relations**  **Overall Expectations**  By the end of this course, students will:  • apply data-management techniques to investigate relationships between two variables;  • demonstrate an understanding of the characteristics of a linear relation;  • connect various representations of a linear relation.  **Specific Expectations:**  *Understanding Characteristics of Linear Relations*  - construct tables of values, graphs, and equations, using a variety of tools (e.g. graphing calculators, spreadsheets, graphing software, paper and pencil), to represent linear relations derived from descriptions of realistic situations.  - compare the properties of direct variation and partial variation in applications, and identify the initial value (e.g., for a relation described in words, or represented as a graph or an equation)  - determine other representations of a linear relation, given one representation (e.g., given a numeric model, determine a graphical model and an algebraic model; given a graph, determine some points on the graph and determine an algebraic model);  **Mathematical Process Focus: Connecting**: students will make connections between the mathematical concepts they have been learning and applications to financial situations. | | At the end of this lesson, students will be able to:   * Connect their understanding of linear relations to investigate the total cost over time of an installment purchase or a service contract (e.g., cell phone plan); * Represent their investigation in at least 2 ways (e.g., numeric, graphical). |
| Instructional Components and Context | | |
| Readiness: Students can   * create a table of values and a graph of this data from a description of a situation involving linearly related data * communicate the meaning of the terminology below either before or after the Action activity.  Terminology linear relation  direct variation  partial variation  initial value  installment purchase  service contracts | Teacher’s Note The lesson times listed in this lesson are suggestions. Times will vary depending on the prior knowledge of your students with the concepts and/or ideas presented. Materials  * Pencil, paper, calculator, graph paper * Project Cards: Sufficient copies of each * BLM 1.1:Project Cards * How Much Will It Cost Really: Project 1: Don’t Pay a Dime Time for a Tablet * How Much Will It Cost Really: Project 2: Play Now Pay Later * How Much Will It Cost Really: Project 3: Talk and Text Now Pay Tomorrow * BLM 1. 2 Assessment Rubric (Checkbric): How Much Does It Cost REALLY * Teacher Resource Sheets 1 - 3: answers to project card problems * Optional: computer with spreadsheet software, graphing calculator, computers with Internet access * Chart paper, document camera (ELMO) or overhead projector | |

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| **Minds On (15 minutes)** | **Connections** |
| **Groups of 4 ⇒ Think, Pair Share**  Students respond to the question: **What are some things that can be purchased and paid for over time?** Pairs brainstorm answers to this question. If necessary explain the concept of installment purchases and service contracts. After 10 minutes each group presents their ideas to the class. Lead a whole class discussion the advantages and disadvantages of these types of purchases. | afl  Check students understanding of the concept of installment purchases and service contracts. |
| **Action!** **(45 minutes)** |  |
| **Groups of 2 ⇒ Investigate: How Much Will It Cost REALLY?**  Each pair of students selects one of the following activity options and completes the task to determine the total cost of an installment purchase or service contract.   1. a. Search the internet for details of an installment purchase   (e.g. ATV or tablet computer) or service contract (e.g. cell phone  plan) and use this information to create a table of values that  represents this relation.  OR  b. Use a Project card (BLM 1.1) with given information about an  installment purchase or service contract to create a table of values  that represents this relation.  OR  c. Provide flyers that include information on an installment purchase.   1. Students complete the following:    1. A data chart showing each installment.    2. Graph of the data using a spreadsheet computer program, graphing calculator or by hand on graph paper.    3. Determine the additional cost when paying over time.    4. Reply to these questions: Does this data represent a linear relation? Give reasons for your answer. Determine if it is a direct or partial relation and determine the initial value.    5. Optional: determine the algebraic representation of your graph. | **DIapplesmallParallel Tasks**  Giving the student choices provides the opportunity for them to select an item of interest to investigate. Also students can select from questions with different levels of complexity. (Note: It is appropriate to modify the numbers in the task for students who find the provided numbers difficult.)  DIapplesmall  #2e provides an opportunity for students who are ready to represent the problem algebraically. All students can benefit from this during consolidation. (Note: the algebraic representation could be a follow up lesson). |

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| **Consolidation** **(15 minutes)** |  |
| **Groups ⇒ Presentation: How Much Did It REALLY Cost?**  While students are working through the Action, select at least 1 pair for each scenario to prepare their solution for presentation to the class. Provide chart paper, document camera (ELMO) or overhead transparency for presentation purposes. Students will show and explain their answers to question 2 a, b, and c from Action. Also ask open questions such as:     1. Does the total cost of the purchase surprise you? Why/why not? 2. Can you afford this purchase? Explain. 3. Why is the total cost when purchased over time different from the cash cost?   **Individual ⇒ Reflection: How Much Did It REALLY Cost?**  Students answer individually in their journals (home) or on an exit card:   1. How many hours would you have to work part-time to earn enough to make the payments? Specify the hourly wage on you based this calculation. 2. What other purchase options might you consider rather than installment purchase or service contracts? Discuss the pros and cons of each. | aal  Students will reflect on the conclusions made from this activity and how this might affect their future purchasing decisions.  aol  Teachers could collect student work including data tables, graphs and conclusions and assess their work based on a rubric (sample provided). |

**BLM 1.1 Project Cards:**

How Much Will It Cost Really: Project 1: Don’t Pay a Dime Time for a Tablet:



A local Computer Store is offering a special purchase option on a tablet computer in 12 easy monthly payments of only $68.99 with no money down. The regular purchase price is $499 plus 13% HST.

a) Create a table of values showing the total amount paid after each month.

b) Create a graph of this relationship. Use technology or pencil and graph paper.

c) Is this a linear relationship? Explain. Is it a direct or partial variation? Give reasons for your answer. State the initial value.

d)What is the total cost of the purchase? How much more does it cost to buy the tablet by installments compared to paying in full at the time of purchase?

How Much Will It Cost Really: Project 2: Play Now Pay Later

**ATV 1**

Play Now Power Sports Outlet is offering a special purchase option on its most popular ATV. You can get this ATV now for $349 down and 24 easy monthly payments of $341. The regular purchase price is $5995 plus 13% HST.

a) Create a table of values showing the total amount paid after each month

b) Create a graph of this relationship. Use technology or pencil and graph paper. Complete the table for the first year and the last payment (24 months) only.

c) Is this a linear relationship? Explain. Is it a direct or partial variation? Give reasons for your answer. State the initial value.

d) What is the total cost of the purchase? How much more does it cost to buy the ATV by installments compared to paying in full at the time of purchase?

How Much Will It Cost Really: Project 3: Talk and Text Now Pay Tomorrow

Cellular Phone 23

You can purchase a SMT Phone from a cellular phone service provider for $199 with no contract obligation or pay $99 for the phone if you sign up for a 2 year contract. The least expensive contract rate is $50 per month which includes 200 anytime talk minutes and up to 500MB data for texting and web surfing. The least expensive no contract option is $30 per month which includes 50 minutes talk time, 100MB data and text messages at $0.15 each. Assume the 13% HST is included in all prices.

a) Using the contract option, create a table of values showing the total amount paid after each month. Assume there are no overage charges. Complete the table for the first year and the last payment (24 months) only.

b) Create a graph of this relationship for the first year. Use technology or pencil and graph paper.

c) Is this a contract payment method a linear relationship? Explain. Is it a direct or partial variation? Give reasons for your answer. State the initial value.

d) What is the total cost of the service contract purchase for two years? How much more does it cost to buy the phone plan by the 2 year contract method compared to no contract option if you sent 100 text messages each month and there were no overage charges for data?

**BLM 1.2 Assessment Rubric (Checkbric): How Much Does It Cost REALLY**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Internet Websites or Project Card Used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Check appropriate level of Achievement*

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| Component | Getting Started  **T & F - Pole Vaulter 14** | On Your Way  **T & F - Pole Vaulter 13** | Reaching High  T & F - Pole Vaulter 11 | Over the Top  T & F - Pole Vaulter 15 |
| Table of Values |  |  |  |  |
| Graph |  |  |  |  |
| Total Cost and Calculation of extra cost |  |  |  |  |
| Characteristics of the Relation |  |  |  |  |
| Conclusions and personal reflections |  |  |  |  |

# Teacher Reference Sheet 1 for BLM 1.1 Project 1: (Answers)

How Much Will It Cost Really: Project 1: Don’t Pay a Dime Time for a Tablet:

a)

|  |  |
| --- | --- |
| Month | Total Amount Paid |
| 1 | $68.99 |
| 2 | $68.99 + $68.99 or $68.99 x 2 = $137.98 |
| 3 | $68.99 x 3 = $206.97 |
| 4 | $275.96 |
| 5 | $344.95 |
| 6 | $413.94 |
| 7 | $482.93 |
| 8 | $551.92 |
| 9 | $620.91 |
| 10 | $689.90 |
| 11 | $758.89 |
| 12 | $827.88 |

b)

Tablet.wmf

c) The total cost of the purchase is $827.88 when paid for by installments.

The total cost if paid for in full when purchased is:

HST: $499 x 0.13 = $64.87

Total cost is $499 + $64.87 = $563.87

The additional cost to buy on an installment plan is $264.01 [$827.88 - $563.87]

d) This is a linear relationship since the graph is a straight line and the finite differences are the same. It is a direct variation because the initial value is zero.

# Teacher Reference Sheet 2 for BLM 1.1 Project 2: (Answers)

How Much Will It Cost Really: Project 2: Play Now Pay Later

a)

|  |  |
| --- | --- |
| Month | Total Amount Paid |
| 0 | $349 |
| 1 | $349 + $341 = $690 |
| 2 | $349 + 2 x $341 = $1031 |
| 3 | $1372 |
| 4 | $1713 |
| 5 | $2054 |
| 6 | $2395 |
| 7 | $2736 |
| 8 | $3077 |
| 9 | $3418 |
| 10 | $3759 |
| 11 | $4100 |
| 12 | $4441 |
| 24 | $349 + 24 x $341=$8533 |

ATV.wmf

c) The total cost of the purchase is $8533 when paid for by installments.

The total cost if paid for in full when purchased is:

HST: $5995 x 0.13 = $779.35

Total cost is $5995 + $779.35 = $6774.35

The additional cost to buy on an installment plan is $1758.65 [$8533 - $6774.35]

d) This is a linear relationship since the graph is a straight line and the finite differences are the same. It is a partial variation because the initial value is not zero. The initial value is $349.

# Teacher Reference Sheet 3 for BLM 1.1 Project 3: (Answers)

How Much Will It Cost Really: Project 3: Talk and Text Now Pay Tomorrow

a)

|  |  |
| --- | --- |
| Month | Total Amount Paid |
| 0 | $99 |
| 1 | $99 + $50 = $149 |
| 2 | $99 + 2 x $50 = $199 |
| 3 | $249 |
| 4 | $299 |
| 5 | $349 |
| 6 | $399 |
| 7 | $449 |
| 8 | $499 |
| 9 | $549 |
| 10 | $599 |
| 11 | $649 |
| 12 | $699 |
| 24 | $99 + 24 x $50 = $1299 |

b)

Cell.wmf

c) The total cost of the 2 year contract is $1299.

The total cost if the no contract option is selected is:

Total cost = Initial cost + (monthly fee + texting charge) x 24 months

= $199 + ($30 + 100 x $0.15) x 24

= $1279

The additional cost to buy using the contract option is $20 [$1299 - $1279]

d) This is a linear relationship since the graph is a straight line and the finite differences are the same. It is a partial variation because the initial value is not zero. The initial value is $99.