

Math Lesson – Where is my Bank Card?

Outcomes or Learning Goals

This Math lesson encourages students to reflect on various aspects of taking responsibility for their finances. Bank cards allow us to purchase goods and services without needing to have cash on hand, and without having to fill in a cheque. They help us keep control of our finances in that we need to have the money in our bank account in order for a purchase to go through. Also, they are replaceable, unlike lost money. On the down side, bank cards usually charge a service fee each time they are used. Keeping track of purchases and fees is an important aspect of financial literacy.

Grade Level

MAT1LZ – Locally Developed Math grade 9

MAT2LZ – Locally Developed Math grade 10

Context & Rationale

The book *Where is my Bank Card?* provides an opportunity for students to calculate banking fees associated with bank cards. It is important for newcomers to have a bank account, be aware of transaction fees, and track and reflect on banking fees they personally incur.

Related Topics/Units

- interpret, write and round decimal numbers with understanding in everyday money situations (Gr. 9)
- solve problems drawn from everyday situations involving money, demonstrating skill and understanding of the use of decimal numbers (Gr. 10)
- communicate information about money concepts/sense (Gr. 9, 10)
- write money values, using correct units (Gr. 9)
- enter decimal numbers correctly on a numerical key pad and read and interpret decimal numbers correctly from a display (Gr. 9)
- demonstrate the effective use of a calculator in operations with decimals (Gr. 9, 10)
- judge the reasonableness of calculations involving decimals, through estimation using mental mathematics, where appropriate (Gr. 9)
- identify, record and monitor daily purchases to determine personal weekly expenditures (Gr. 9)
- verbalize their observations and reflections regarding money sense and ask questions to clarify their understanding (Gr. 9, 10)
- communicate, orally and in writing, the solutions to money problems and the results of investigations, using appropriate terminology, symbols and form (Gr. 9, 10)
- explain their reasoning used in problem solving and in judging reasonableness (Gr. 9, 10)
- develop, select, and apply problem-solving strategies while posing and solving problems (Gr. 9)
- solve problems drawn from everyday situations involving percent, ratio, and rate (Gr. 9, 10)
- communicate information about proportional reasoning (Gr. 9)
- round decimal values appropriately within a given context (Gr. 9, 10)

- calculate rates in activities drawn from their experiences (Gr. 9)
- solve problems involving rates (Gr. 9, 10)
- communicate, orally and in writing, the solutions to proportional reasoning problems and the results of investigations, using appropriate terminology, symbols and form (Gr. 9)

Number Sense and Numeration Skills from the Ontario Mathematics Curriculum, Grades 1-8 (2005), that link well to this lesson and would support the needs of limited prior formal learning students are:

- add and subtract decimal numbers to hundredths, including money amounts, using concrete materials, estimation, and algorithms (Gr. 5)
- demonstrate an understanding of simple multiplicative relationships involving whole-number rates, through investigation using concrete materials and drawings (Gr. 5)
- represent relationships using unit rates (Gr. 6)

Additional References:

Big Ideas and Questioning K-12: Proportional Reasoning

http://www.edugains.ca/resources/LearningMaterials/ContinuumConnection/BigIdeasQuestioning_ProportionalReasoning.pdf

This Ministry resource identifies the key concepts in proportional reasoning across each division. Questions connected to each big idea are provided in the resource as a means for differentiating instruction while provoking and clarifying thinking.

Lesson Sequence

Part 1 Minds On/Prior Learning (15 minutes estimated for this section)	What to prepare
<p>Activity</p> <p>1. Number String Warm Up</p> <p>This number string mini-lesson is based on a number string in <i>Minilessons for Early Multiplication and Division</i>, p. 40, by Catherine Twomey Fosnot. This number string encourages students to use “friendly multiplication facts” as partial products to find the answers for more challenging problems (the distributive property). Present one fact at a time, and record answers and thinking in a T-chart.</p> <p>Use the context of buying tickets for a large group of students at the cost of \$7.00 per ticket. Do one problem at a time, and encourage students to use the first few problems in the string to solve problems later in the string. Model the recording of student thinking on a T-chart.</p> <p>One ticket costs \$7.00. We can record it as 1×7. (Record on T-chart) How much would the cost be for:</p> <ul style="list-style-type: none"> 10 tickets 5 tickets 20 tickets 25 tickets 40 tickets 	<p>Copies of the book <i>Where is my Bank Card?</i></p>

100 tickets
 95 tickets
 250 tickets
 230 tickets

The completed T-chart should look something like this when finished:

# of tickets	cost in \$	
1	7	1×7
10	70	10×7
5	35	5×7
20	140	$(10 \times 7) \times 2$
25	175	$(20 \times 7) + (5 \times 7)$
40	280	$(20 \times 7) \times 2$
100	700	100×7
95	665	$(100 \times 7) - (5 \times 7)$
250	1750	$(25 \times 7) \times 10$
230	1610	$(250 \times 6) - (20 \times 7)$

State: "This T-chart or table is called a ratio table (also may be referred to as a rate table). This might be a tool you use when solving today's problem."

If you have a class anchor chart of strategies/tools, add ratio table to your list.

2. Remind students of the book they have read, *Where is my Bank Card?*

Assessment

For the class in general, assess fluency of multiplication facts, and ability to use strategies such as doubling, halving, 10 x facts, 100 x facts, and partial products. You may be able to assess the computational fluency of a number of individual students as they share the answers to facts and explain their thinking

Part 2 - Work On It

(30 minutes estimated for this section)

Work in small groups - 2 per group.

Anas uses a bank card for two reasons: to pay for goods and services (i.e., pay for purchases), and to withdraw money from his bank account.

The bank has a service charge each time Anas uses his bank card.

If the bank charges Anas \$1.50 each time he uses his card:

- How much would Anas have to pay in service charges if he uses his card 5 times? 10 times? 25 times? (n times)
- If Anas has \$200.00 in his bank, how much would he have left after he pays for the service charges?
- The bank offers Anas another option: Anas could pay a monthly service charge of \$20, and have unlimited use of his bank card, without services charges. Should Anas use this option? Explain.

Blank paper for students to record thinking and solution.

<p>Alternate Task/Extension</p> <p>Change the service charge, and/or change the number of transactions Anas makes in one month.</p> <p>Activities During Work Period</p> <ul style="list-style-type: none"> • Students work with partners and record question, work/thinking, and answer on chart paper. • Teacher visits partners to clarify the question they are answering and to see if they have a strategy to start/continue working on the problem. • Teacher thinks about which solutions to share in the third part of the lesson, and the order in which they will be shared. Solutions selected should show a variety of strategies (and hopefully will include the ratio table). 	
<p>Assessment</p> <p>For each student, observe and document:</p> <ul style="list-style-type: none"> - use of multiplicative reasoning - computational strategies and fluency - clear representation of the problem and communication of thinking 	
<p>Part 3 – Conclude & Share Solutions (20 minutes estimated for this section)</p>	
<p>Activity</p> <p>The solutions selected (2-4) are shared, starting with the simplest strategy and moving to the most complex. Consider which tools/models/algorithms would best support the learning of the class. Also, consider clarity of communication when selecting solutions and order in which to share.</p> <p>As students share their work, encourage them to discuss <i>how</i> they solved the problem. You may wish to question the students to focus attention on a particular aspect of their solution, rather than inviting the student to share their entire process/solution. Invite other students to ask questions of the presenters.</p> <p>At the end of the sharing, have a discussion about what option might be best for Anas: transaction charges or a monthly service charge. What do your students think is best? Why?</p> <p>At the end of the sharing, highlight key learning by recording it on the whiteboard or on chart paper. The key learning may be connected to a model or strategy used to solve the problem, or to the problem itself.</p>	

<p>Assessment</p> <p>For each student, continue to observe and document:</p> <ul style="list-style-type: none"> - use of multiplicative reasoning - ability to apply use of a (new) model/tool - clear representation of the problem and communication of thinking <p>Based on your assessment for learning data, do students need additional opportunities to:</p> <ul style="list-style-type: none"> - acquire basic multiplication facts - develop mental computational skills - use a variety of strategies and tools to solve problems involving rate - communicate thinking and reasoning <p>Select problems for future exploration based on student learning needs.</p>	
<p>Follow up Problems/Learning Opportunities</p> <p>1. Do you have a bank card? Do you know what the service charge fees are for it? How many times do you use it in a month? How much are you paying?</p> <p>2. Make up your own similar problem. Or Imagine you do have a bank card. Imagine the fee, and how much you would have to pay in a month.</p> <p>It is important for students to have computational fluency when monitoring their finances. Consider teaching ten-minute mini-lessons involving number strings as frequently as possible. The mini-lessons support students in learning basic facts and mental math computational skills through conceptual understanding and thinking.</p> <p>For additional mini-lessons involving number strings refer to: <i>Minilessons for Early Multiplication and Division</i>, by Catherine Twomey Fosnot. <i>Minilessons for Extending Multiplication and Division</i>, by Catherine Twomey Fosnot.</p>	