

Math Lesson – Applying to College

Outcomes or Learning Goals

The story *Applying for College* supports students in understanding the benefits, and the cautions, of having a credit card. The related math problems involve calculating the interest charges owed to a credit card company when the monthly balance is not paid in time.

Grade Level

MAT1LZ – Locally Developed Math grade 9

MAT2LZ – Locally Developed Math grade 10

Context & Rationale

In the story *Applying for College*, Nazim learns how credit cards can be helpful. He also learns some important lessons related to owning a credit card: never spend more money than you have (or that you can earn), and always pay the full amount on your credit card bill each month. The context provides an opportunity for students to calculate potential interest charges when a credit card balance is not paid in full.

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)
- use literacy skills (reading, writing, listening and speaking) to obtain and communicate information about money sense (Gr. 9)
- write money values, using correct units (Gr. 9)
- round money values to stated accuracies, in applications drawn from everyday situations (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)
- 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 (Gr. 9, 10)
- round decimal values appropriately within a given context (Gr. 9, 10)
- solve problems involving percentages in practical situations (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)
- solve problems that involve determining whole number percents, using a variety of tools (Gr. 7)
- solve problems involving percent that arise from real-life contexts (Gr. 8)

Additional References:

Targeted Implementation and Planning Supports for Revised Mathematics (TIPS4RM)

This Ministry resource offers ways of thinking about mathematics education, connects to current research, and includes grade-level support materials for educators working with students in Grades 7 to 10.

TIPS4RM Grade 7, Unit 7: Fractions, Decimals and Percent

<http://www.edu.gov.on.ca/eng/studentssuccess/lms/files/tips4rm/gr7Unit7.pdf>

TIPS4RM Grade 8, Unit 5: Fractions, Decimals and Percent

<http://www.edu.gov.on.ca/eng/studentssuccess/lms/files/tips4rm/gr8Unit5.pdf>

TIPS for English Language Learners in Mathematics

This Ministry resource offers additional support materials for educators working with English Language Learners in Grades 7 to 10.

Grade 7 <http://www.edu.gov.on.ca/eng/studentssuccess/lms/files/ELLgr7.pdf>

Grade 8 <http://www.edu.gov.on.ca/eng/studentssuccess/lms/files/ELLgr8.pdf>

Grade 9 <http://www.edu.gov.on.ca/eng/studentssuccess/lms/files/ELLgr9.pdf>

Grade 10 <http://www.edu.gov.on.ca/eng/studentssuccess/lms/files/ELLgr10.pdf>

Cooperative Education Financial Literacy Lessons

The Ontario Cooperative Education Association has developed a number of Financial Literacy lesson plans. These lessons have been designed to support teachers in implementing financial literacy education in the integration portion of Cooperative Education, but which can be adapted for English Language Learners. This lesson supports understanding of credit.

http://www.ocea.on.ca/UploadedFiles/files/financial_literacy_lesson_3_-_credit.pdf

Lesson Sequence

Part 1 Minds On/Prior Learning (15 minutes estimated for this section)	What to prepare
<p>Activity</p> <p>1. Remind students of the book they have read, <i>Applying for College</i>.</p> <p>2. Nazim will need a credit card when he is at college. Do you know anyone with a credit card? How are they used? What do you need to be careful about? Credit cards are helpful only if you pay off the entire amount owing every month. If you do this, there is no additional charge. If you do not pay the entire amount, you must pay high interest charges on the amount you have not paid. Interest charges from credit card companies are about 20% per year. To compare, banks would charge about 5 or 6% to loan you money. This is much less!</p> <p>3. Let's think about the 20% per year interest charge. Turn and talk to an elbow partner about this situation: If Nazim carried a balance of \$100 on his credit card:</p> <ul style="list-style-type: none">• what would be the interest charge for one year? (20% of \$100 = \$20)• what would be the interest charge on \$100 for one month? ($\\$20 \div 12$ months = \$1.67) <p>Present questions one at a time. Students may be able to do these calculations mentally, or may need scrap paper or a device to do the calculation. As students share their answers and explain their thinking, record solutions on the board for students to refer to during the Work On It portion of the lesson.</p>	Copies of the book <i>Applying for College</i>
<p>Assessment</p> <p>For the class in general, assess:</p> <ul style="list-style-type: none">- understanding of how a credit card is used, how interest payments are incurred, and how a monthly interest charge would be calculated- fluency of simple multiplication facts (100 X 20)- strategies used to multiply and divide- ability to round up decimal to an appropriate amount; when discussing money, this would be to the nearest hundredth- ability of students to explain their thinking/solution	Checklist or anecdotal log to track assessment data

<p>Part 2 – Work On It (30 minutes estimated for this section)</p>	
<p>Work in small groups - 2 per group.</p> <p>1. If Nazim had a credit card, balance of \$1,200.00 one month, and paid only \$700.00:</p> <ol style="list-style-type: none"> How much money would he still owe? How much would the credit card company charge him in interest if he owed that amount for a year? What would be the charge if he owed that amount for one month? What would the bank charge you if you borrowed the same amount of money for one year? <p>Differentiating Instruction</p> <p>Select different balances: if students are paired homogenously, then each pair could be given a different balance with which to calculate interest charges.</p> <p>To make the problem open-ended, have students determine the balance of money owing on the credit card, and then calculate the interest charges.</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>Blank paper for students to record thinking and solution.</p> <p>Weekly grocery store flyers (optional for Problem 1)</p>
<p>Assessment</p> <p>For each student, observe and document:</p> <ul style="list-style-type: none"> - understanding of how a monthly interest charge would be calculated - strategies used to multiply and divide - ability to round up decimal to an appropriate amount; when discussing money, this would be to the nearest hundredth - ability of students to explain their thinking/solution 	<p>Checklist or anecdotal log to track assessment data</p>

<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, 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"> - understanding of how a monthly interest charge would be calculated - computational strategies used to multiply and divide - ability to round up decimal to an appropriate amount; when discussing money, this would be to the nearest hundredth - 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"> - develop fluency in basic multiplication and division facts - use a variety of strategies & tools to solve problems involving percent - communicate thinking and reasoning <p>Select problems for future exploration based on student learning needs.</p>	<p>Checklist or anecdotal log to track assessment data</p>
<p>Follow up Problems/Learning Opportunities</p> <ol style="list-style-type: none"> 1. Look at a credit card application form. What information does the credit card company want? Why do you think they need this information? 2. Based on what you have learned about credit cards, when would be an appropriate time in someone’s life to apply for a credit card? Explain your thinking. 3. Do you think you are ready to have a credit card? Why or why not? 	<p>Sample credit card application forms</p>