

Math Lesson – Time to Save!

Outcomes or Learning Goals

- Solve problems involving money drawn from everyday situations
- Write money values, using correct units
- Demonstrate the effective use of a calculator in operations with decimals
- Communicate information about money sense
- Create a savings plan
- Verbalize their observations and reflections regarding money sense and ask questions to clarify their understanding
- Explain their reasoning used in problem solving and in judging reasonableness
- Develop, select, and apply problem-solving strategies while posing and solving problems
- Explore and identify rates drawn from their experiences (e.g., rate of pay)

Grade Levels

MAT1LZ – Locally Developed Math grade 9

MAT2LZ – Locally Developed Math grade 10

Context & Rationale

In the book *Time to Save!*, students read about Lara, a student who opens a savings account and a chequing account as she prepares to start college. Students are ready to learn how these services work as they begin to pursue activities that require the use of financial services. Solving problems in real-life contexts, such as those provided in this lesson, helps newcomer English Language Learners, especially those with limited prior formal schooling, to develop mathematical skills and financial concepts that they can use immediately in their daily lives.

Related Topics/Units

The story *Time to Save!*, provides various opportunities for students to learn about the use of bank accounts and how savings and chequing accounts can serve them. Students can apply mathematical skills and financial concepts such as the calculation of deposits and withdrawals; development of a savings plan; use of decimals and appropriate operations on a calculator; application of the relationships of repeated addition, multiplication, and division; comparison of hourly pay rates, and the creation of multi-step problems. These are all possible topics likely to emerge from the questions students formulate based on the picture prompts. In addition, these problems adapt well to differentiation needs and can be used to introduce, practise, review, or consolidate concepts. Finally, these discussions related to bank accounts can be extended to further exploration of financial decisions: how to identify a need to save, organize a savings plan, plan a budget, and compare different bank account options. The ad used in the math prompt could also launch discussions about hourly pay, salaries, and the minimum wage.

Number Sense and Numeration Skills from the *Ontario Elementary Mathematics Curriculum* that link well to this lesson and would support the needs of limited prior formal learning students are:

- Estimate, count, and represent (using the \$ symbol) the value of a collection of coins and bills with a maximum value of \$100 (Gr. 4)
- Solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 10 000 (Gr. 4)
- Add and subtract three-digit numbers, using concrete materials, student-generated algorithms, and standard algorithms
- Add and subtract money amounts up to \$100 (Gr. 4)
- 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 unit rates (Gr. 4)

Resources

Accompanying Powerpoint: *"Time to Save! Math Prompts"*

From ***Time to Save*** Unit Materials:

Poster – *Banking Verbs* Poster – *Kinds of Bank Accounts*

Lesson Sequence

Part 1 Minds on/Prior Learning (15 - 20 minutes)	What to Prepare
<p style="text-align: center;">Activity</p> <p>Remind students of the book they read, <i>Ready To Take Off</i>. Tell them they will be making and solving math problems by using some ideas from the story.</p> <p>Ask – Has anyone ever saved up for something? How did they do it?</p> <p>Provide a simple example: A student receives \$5 per week as an allowance. The student is saving up for a class trip that costs \$30. How long might it take to have enough money for the trip?</p> <p>Have students discuss the problem with their elbow partners, and invite someone to share a strategy and solution.</p> <p>Begin the “<i>Time to Save!</i> Math Prompts”, Powerpoint to activate prior knowledge and to foster creation of the math problems for the lesson. If desired, the teacher may use the following prompts with the slides.</p> <p>NOTE: Allow students to represent their solutions visually and in a variety of ways: jumps on a number line, repeated addition, multiplication expression etc.</p> <p>Slide #2 Why does Lara have this expression on her face? (<i>She found out she needs to spend \$500 on books for college – maybe she doesn't have enough in her bank account.</i>)</p> <p>Slide #3 What information do we learn from the Coffee Shop ad</p> <p>Slide #4 What math questions come to mind? Responses to anticipate: (varying levels of difficulty) <i>How much money will Lara need to earn? How long will it take Lara to save up for the books after she starts her job?</i> (<i>practice using estimation – ie. estimate at \$10/hour</i>) <i>How many hours will Lara need to work in order to buy the books? What would the deposits look like in her savings account while she saves up for her books?</i></p>	<ul style="list-style-type: none">• Hard copy or computer view of a bank statement showing deposits and balance• Accompanying Powerpoint “<i>Time to Save!</i> Math Prompts”• Math kit - bills and coins• Display board and/or chart paper and markers• Students seated with an elbow partner <p>Prior Knowledge Needed:</p> <ul style="list-style-type: none">• Values of coins and bills• Writing money with \$ and decimal points• Understanding of addition and subtraction• Understanding of relationship of repeated addition and multiplication• Understanding of hourly rates• Adding and multiplying decimals on a calculator

Part 1 Minds on/Prior Learning (15 - 20 minutes)	What to Prepare
<p>To provide more challenge, Slides #6 and #7 can be added.</p> <p>Slide #6 – dates that might be interpreted as when Lara starts her job and when she needs to purchase her books.</p> <p>Slide #7 – collection of all 4 prompts. Responses to anticipate: <i>Will Lara be able to make enough money to buy the books by the 28th?</i></p> <p><i>What are some possible weekly work schedules to help her make enough money by the 28th? What would a savings plan look like that would include her wages as well as other deposits and withdrawals?</i></p> <p><i>(The teacher might want to explain that deductions would be taken from the \$10.25, but disregard the deductions for this lesson.)</i></p> <p>As a class, co-create the question to be solved and post in an accessible location or record on Slide #5 to remain displayed.</p> <p>Differentiation needs: For students who are struggling or requiring a more challenging question, the teacher can have the students use fewer or more slides to create a question or change the numbers involved to more “friendly” ones.</p> <p>Consider choosing an alternate, easier parallel question for some students to explore.</p>	
<p style="text-align: center;">Assessment For Learning</p> <p>Observe student remarks and questions during the discussion of the slides and creation of questions:</p> <ul style="list-style-type: none"> • Do students understand how hourly/weekly rates work? • Do students understand a target amount and how to save up in order to reach the amount? • During the question creation discussion, which students created an easy question or more challenging question? What might have been the factors influencing the students who created the easy questions? • What vocabulary strengths/needs are evident during the class discussion and partner talk? 	<p>Make a note of any students who will need additional support or would benefit from a more challenging problem.</p>

Part 1 Minds on/Prior Learning (15 - 20 minutes)

What to Prepare

Part 2 – Work on it (25 – 30 minutes)

Before beginning work:

- Read/review/co-create appropriate terms for the math word wall. (*earn, account, deposit, balance, hourly rate, per hour, per week, amount, coin, bill, dollars, cents, total, etc.*)
- Show class various materials they might choose to use when solving their problem: *calculator, calendar sheets, hourly pay*
- Grid chart paper, markers

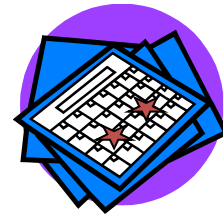
Keep Slide #5 displayed for student reference during the work period.

Activities During Work Period

- Students work with partners and record question, work, and final answer on chart paper.
- Grid chart paper works well when working with decimals and money.
- Teacher visits partners to clarify the question they are answering and remind students of the picture and information in the ad.
- Challenge students who solve their problem quickly to think of more information they could add to Lara's situation, such as other expenses (in addition to saving) that she needs to cover with her coffee shop earnings.
- The teacher may choose to have the students work with a partner or in small groups, depending upon the composition of the class.

Supply a Variety of Tools:

- Blank calendar: ie. each week = \$100
If I only get 10 hours... etc.



- Calculator
- Ratio table ie. \$10/hour, 10 hours/week

Weeks	Earned Money\$
1	100
2	200
5	500

Part 1 Minds on/Prior Learning (15 - 20 minutes)	What to Prepare
<p style="text-align: center;">Assessment</p> <p>Allow students time to get started and then move around the room to observe each group. Listen to the discussions.</p> <ul style="list-style-type: none"> • Are they using math vocabulary? (<i>save up, amount, total, earn account, balance, deposit, hourly pay, etc.</i>) • Are students writing the money amounts correctly? • Note which students require support to clarify the meaning of the question, organize work, choose a strategy. • For those students using an algorithm, probe their reasons for choosing the particular operation and numbers. • Observe which groups use similar approaches/organization. Select varying examples to be shared in Part 3. • Do students know to subtract the current balance of \$90 to determine how much needed to be earned? • Do students understand what to do with the hourly rate of \$10.25? 	
Part 3 – Conclude and Share Solutions (15 - 20 minutes)	
<p style="text-align: center;">Activity</p> <p>Bring the class back together.</p> <ul style="list-style-type: none"> • Choose different groups to share their questions and answers, beginning with the easier questions. • Discuss with groups what their final answer is. How do they know it is right? Does it seem reasonable? (NOTE: Great opportunity to check in on students understanding of this concept. Can help determine instructional next steps.) • Ask students to help create a list of different ways the problem was solved. (Picture, recording on calendar, table, repeated addition, multiplication, subtraction, division, etc.) • For those groups choosing to use an algorithm, ask them to explain why they selected the particular operation and numbers. • Discuss the different ways students organized their work. Which ways seemed to work well? (List, table, sequence of steps) 	
<p style="text-align: center;">Follow up</p> <p>Exit Ticket – Provide a brief explanation of the “saving up” activity on BLM#1.</p>	<p>Exit Ticket: BLM #1</p>

Part 1 Minds on/Prior Learning (15 - 20 minutes)	What to Prepare
<p style="text-align: center;">Assessment</p> <p>Check student results for Exit Ticket.</p> <ul style="list-style-type: none"> • Did students write money amounts correctly? • Did they use the calculator confidently and accurately? • Did students know to subtract their current savings from the target amount? • Did students understand how to organize the amounts of money for deposit? • Did students know that the final balance should be equal to their amount in #2? 	

Resources

Accompanying Powerpoint “*Pay the Fine Math Prompts*”

BLM #1 Exit Ticket – Time to Save

Name: _____

Date: _____

What would you like to save up for?	
What is the amount you need?	
How much money have you saved already in your account?	
Where might you get money for your deposits?	
<p>Show how you can save up for this amount in your savings account:</p>	
<p>Balance in my savings account: _____</p>	