

Math Lesson – Htee Moo’s Shoes

Outcomes or Learning Goals

- Solve problems involving money drawn from everyday situations (9/10)
- Communicate information about money concepts (9)
- Write money values, using correct units (9)
- Identify different combinations of coins and bills that would result in a given amount of money (9)
- Demonstrate the effective use of a calculator in operations with decimals (9/10)
- Communicate information about money sense (10)
- Verbalize their observations and reflections regarding money sense and ask questions to clarify their understanding (10)
- Explain their reasoning used in problem solving and in judging reasonableness (9/10)

Grade Levels 7-10

MAT1LZ – Locally Developed Math grade 9

MAT2LZ – Locally Developed Math grade 10

Context & Rationale

Learning to make wise choices with money is an ongoing challenge for many teens, but it is especially difficult for newcomers. Identifying and solving problems in a real-life context will help English Language Learners, particularly those with limited prior schooling, navigate the Ontario financial system and develop the knowledge and skills they require to be financially successful.

Related Topics/Units

The story “Htee Moo’s Shoes” includes references to several financial topics which can be used to teach mathematical and financial skills in context. This text can be used to create and solve problems related to estimation and rounding, multiple representations of the same sum of money using different coins or bills, the calculation of sales taxes, total price and change. It can also provide students with the opportunity to explore decimals on a calculator. The lesson provided here is targeted to multiple representations of the same sum of money and using calculators.

The concepts of impulse buying, making good choices and planning for future purchases could also be linked to this story and provide opportunities for discussion, journaling, story writing or roleplaying.

Number Sense and Numeration Skills from the *Ontario Elementary Mathematics Curriculum* that link well to this lesson and 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 \$10 (Gr. 3) and \$100 (Gr. 4)
- Count forward by 1's, 2's, 5's, 10's, 25's, and 100's from various starting points (Gr. 3)
- Add and subtract money amounts by making simulated purchases and providing amount for change up to \$100 (Gr. 4)
- Relate multiplication of one-digit numbers to real-life situations (Gr. 3)
- Demonstrate an understanding of simple multiplicative relationships involving unit rates (Gr. 4)
- Add and subtract decimal numbers to hundredths, including money amounts, using concrete materials, estimation, and algorithms (Gr. 5)
- Multiply decimal numbers by 10, 100, 1000 (Gr. 5)

Process Expectations:

- Problem solving: develop, select and apply problem-solving strategies as students pose and solve problems and conduct investigations to help deepen mathematical understanding learning tools and appropriate computational strategies to investigate mathematical ideas and to solve problems
- Selecting Tools and Computational Strategies: select and use a variety of concrete, visuals and electronic

Concepts such as the merits of fines in various circumstances and the acceptance of inherent responsibilities as part of an agreement, as well as the possible consequences for noncompliance, could be explored further through research and debate activities.

Useful Resources

Ministry of Education Ontario: Guides to Effective Instruction in Mathematics, Grade 4-6:

Volume 1: ***Big Ideas*** for an explanation of the key concepts in number sense and numeration across the junior grades, as well as appropriate models and tools that support students in understanding these concepts

Volume 2: ***Addition and Subtraction*** – addresses key concepts, computational strategies, estimation and addition and subtraction of decimals. It also contains sample lessons

Volume 3: ***Multiplication*** – addresses understanding of multiplicative situations, learning basic facts, multiplying by multiples of 10, computational strategies, strategies for multiplying decimals. It also includes instructional strategies and sample learning activities

Minilessons for Early Multiplication and Division; by W. Uittenbogaard, C. Fosnet---This resource provides short 10-15 minute lessons which support students acquiring basic facts and mental computational skills.

Lesson Sequence

Part 1 Minds on/Prior Learning (15 - 20 minutes)	What to Prepare
<p style="text-align: center;">Activity</p> <p>Write \$100/\$100.00 on the board. (With or without the decimal point, depending upon the readiness of the class.)</p> <p>Ask – “How many different ways can you think of to make \$100?” What are some of the combinations of bills you could have to make this amount? (<i>Possible challenge – “What if you had loonies and toonies?”</i>)</p> <p>Have students work with an elbow partner to create at least one possible combination of bills/or coins and bills to show the amount.</p> <p>If students are working with “play” money, have them model the amount on their desks. If not, they should draw simple pictures or make a chart to indicate how many of each bill/coin they have on a piece of chart paper. (See example chart in BLM 1 and 2 – Ways to Make \$200)</p>	<ul style="list-style-type: none">• Students in pairs• Canadian “play” money, hundreds charts, base 10 blocks, calculators• Display board and/or chart paper and markers <p>Prior Knowledge Needed:</p> <ul style="list-style-type: none">• Values of coins and bills• Ability to count by multiples of 10• Adding sums of money with decimals• Using a calculator• Writing money with \$ and decimal points e.g. \$200
<p style="text-align: center;">Assessment</p> <p>Observe student partners to see how readily they perform the task.</p> <ul style="list-style-type: none">• Which students can add the numbers mentally?• Which students use the manipulative materials? (Which do they prefer?)• Which students choose an “easy” or “more challenging” solution?• Share responses as a group• Ask - “How did you check to see if your answer was reasonable/correct?” “How can you prove the combination of money you have really has the value of \$100?”	<p>Make a note of any students who will need additional support or would benefit from a more challenging amount/approach to the problem.</p>

Part 1 Minds on/Prior Learning (15 - 20 minutes)	What to Prepare
<p style="text-align: center;">Part 2 – Work on it (25 – 30 minutes)</p>	<p>Before beginning work:</p> <ul style="list-style-type: none"> Review key money/math vocabulary prior to beginning activity Read/ review appropriate terms on the math word wall. (<i>value, amount, coin, bill, dollars, cents, worth, total, sum, etc.</i>)
<p style="text-align: center;">Activities During Work Period</p> <p>Have a student briefly summarize the story of <i>Htee Moo's Shoes</i>.</p> <ul style="list-style-type: none"> Show students the Ways to Make \$200 Poster or refer them to money visuals already posted in the classroom Remind them that Htee Moo had \$200 to spend, but the text didn't say what bills or coins he had Challenge them to come up with as many options as possible. Leave the problem as open-ended as possible so that students may choose to work out amounts with coins as well as bills You may choose to have the students work with a partner or in small groups depending upon the needs of the class 	<p>Supply a Variety of Tools:</p> <ul style="list-style-type: none"> Give BLM 1 – Ways to Make \$200 to students who need organizational support, or lack experience writing money with decimals. (Or display it on a SmartBoard or overhead) More proficient students can create their own diagram or table to track their results or use BLM 2
<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 discussion.</p> <ul style="list-style-type: none"> Are they using math vocabulary? (<i>dollars, amount, total, value, worth, etc.</i>) Ask students to tell you the value of different combinations of bills (or coins if they are using any). If a group is adding multiple bills of the same value, ask them if they can think of a faster way to calculate the amount. E.g. <i>"Is there a faster way to find out the value of four twenty dollar bills?"</i> Do students realize they can use multiplication instead of repeated addition? Make note of which students are coping easily with the activity and which ones need additional support. If the sum of \$200 is too high, encourage students to select a more comfortable amount Pay attention to any observations students make regarding which quantities of bills they think would be most commonly used (twenties from an ATM) or easiest to carry, etc. Pay attention to the strategies students use to add money. E.g. start with largest dollar amounts, make "friendly" numbers (ie. 10's, 25, 20, 75) 	<ul style="list-style-type: none"> Students need easy access to concrete materials or chart paper and markers to record their diagrams and ideas

Part 3 – Conclude and Share Solutions (15 - 20 minutes)

Activity

Bring the class back together.

Ask – “What combinations of bills did you find?”

- Choose groups that worked on lower amounts first. Encourage them to share one or two combinations. Record the quantities of bills and the total amount on a chart similar to BLM – **Ways to Make \$200**
- Give 2 – 4 groups the chance to briefly share their results, depending upon the range of amounts chosen

Ask – “How do you know your answer is reasonable? What strategies did you use to check your work?” (If you observed students multiplying and/or adding the sums have them explain what they did. If they used calculators, ask them to review how to add)

- Go back to your chart. Choose one of the examples and ask students to give the value for the number of bills in each column – e.g. “What is the value of two \$50 bills? Write the amount in the 50 column using a dollar sign and decimal point. What is the value of 3 \$20 bills? Write that amount in the 20 column beside it etc.
- Demonstrate how to add the sums of money by lining up the decimal points

- Students need prior experience adding decimals in money if you choose to include the final part of the activity listed here
- Grid paper can be helpful in assisting students to line up places and decimal points. Be sure to demonstrate how to set up money questions prior to having the students use the grid

Follow up

Have students work independently to pick an amount of money and record how many different ways they can make the same sum.

- Encourage them to add and/or multiply the sums together to confirm the total value
- Exit Ticket – You have \$75. Which bills or coins would you like to have? Show the number of bills and their values. Give reasons for your answer

Follow up lesson: Making Change

- Htee Moo had \$200 and the shoes cost him \$113. What change would Htee Moo get back from his \$200 when purchasing the red shoes? What possible combinations of bills and coins might the sales clerk give him?

- Math journals or workbooks
- Exit Ticket could be on loose paper or in their books

Part 3 – Conclude and Share Solutions (15 - 20 minutes)

Assessment

Check student results for the Follow up activity.

- Which students have understood the concept, and which will need further practice?

Collect the exit tickets (or interview students).

- Were students able to organize their work effectively?
- Were the calculations correct?
- Did they give valid reasons for their choice of bills/coins?

Resources

- Ways to Make \$200 Poster
- BLM 1 – Ways to Make \$200
- BLM – Ways to Make \$_____

Ways to Make \$ 200



\$200



How many different combinations (groups) of bills and/or coins can you find to make a total of \$200?

