

# Math Lesson – What Should I Buy?

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## Outcomes or Learning Goals

- Solve problems involving money drawn from everyday situations (9)
- Communicate information about money concepts (9)
- Round money values to stated accuracies (e.g. the nearest cents, dollar) in applications drawn from everyday situations (9)
- Write money values as decimals, and round money values appropriately, in solving problems found in everyday contexts (10)
- Use estimation strategies involving addition, subtraction, multiplication and division to round money values appropriately within a given context (9)
- Demonstrate the effective use of a calculator in operations with decimals (9/10)
- Estimate the change for a transaction (9)
- Solve problems involving sales tax (10)
- Communicate, orally and in writing, the solutions to money problems and the results of investigations, using appropriate terminology, symbols and form (10)
- Round decimal values appropriately in solving problems drawn from everyday situations (10)

## Grade Levels 7 - 10

MAT1LZ – Locally Developed Math grade 9

MAT2LZ – Locally Developed Math grade 10

## Context & Rationale

Planning for purchases and balancing needs and wants are life skills everyone needs to develop for financial success. This is particularly true for newcomers with limited prior schooling because many of them are forced to live on limited incomes. 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, “What Should I Buy?” introduces the financial literacy concepts of planning for purchases, making good choices, taxes and comparison shopping. It reinforces these through Sunita’s use of the mathematical strategies of rounding and estimation. This text can be used to create and solve problems related to estimation and rounding, the calculation of sales taxes, total price and change. It can also provide students with the opportunity to explore decimals on a calculator.

This text also provides opportunities for student communication through discussion, journaling, creating lists, or story writing.

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

## 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

## Lesson Sequence

| Part 1 Minds on/Prior Learning (15 - 20 minutes)  | What to Prepare  |
|---|--|
| <p style="text-align: center;"><b>Activity</b></p> <p>Ask students to work on their own or with a partner. Tell them; “On a scrap piece of paper, jot down 3-5 times you have used math in the last few days. Beside each item, record an “A” if you calculated the actual answer or an “E” if you estimated.” (It would be good for the teacher to share an example.) Have students share and discuss. They will likely notice that in our everyday lives, we use estimation most of the time.</p> <ul style="list-style-type: none"><li>• Have students find the items Sunita bought and their costs. Record them on a chart or display board</li><li>• Use one example to review rounding. (Students should be familiar with the rules of rounding already. They should have an anchor chart or other resource to refer to for support.)</li></ul> <p>Ask – “What amount do you think Sunita got when she rounded the prices? Work with your partner(s) to find out. When you are finished, use the calculator to see how close your estimate is to the actual cost.”</p> <ul style="list-style-type: none"><li>• Students work with a partner or group to solve the problem</li></ul> | <ul style="list-style-type: none"><li>• Copies of “What Should I Buy?” (or scanned text on SmartBoard)</li><li>• Students in pairs or small groups</li><li>• Calculators (minimum 1 per group)</li><li>• Anchor chart – rounding</li><li>• Number lines or hundreds charts</li></ul> <p><b>Prior Knowledge Needed:</b></p> <ul style="list-style-type: none"><li>• Values of coins and bills</li><li>• How to calculate and add taxes to an item</li><li>• Ability to round</li><li>• Adding sums of money with decimals</li><li>• Using a calculator</li><li>• Writing money with \$ and decimal points</li></ul> |
| <p style="text-align: center;"><b>Assessment</b></p> <p>Observe student partners to see how readily they perform the task.</p> <ul style="list-style-type: none"><li>• Can they read the money amounts properly?</li><li>• How do they decide whether to round up or down?</li><li>• Three bags of milk – Do they forget to include the extra bags? How do they round to find the answer for three bags?</li><li>• Listen for math vocabulary. (<i>round, up/down, amount, estimate, dollars, cents, etc.</i>)</li></ul> <p>Bring group back together to share their findings.</p> <p>Ask – “What was your estimate? Does everyone agree? Why/why not?”</p> <ul style="list-style-type: none"><li>• If groups forgot/didn’t round the cost of 3 bags of milk correctly, ask a successful group to share what they did</li></ul>   | <p>Make a note of any students who will need additional support. Find a group who has estimated the cost of 3 bags of milk correctly to share with the class at the end of the activity.</p>   |

| Part 1 Minds on/Prior Learning (15 - 20 minutes)  | What to Prepare   |
|---|---|
| <p style="text-align: center;"><b>Part 2 – Work on it (25 – 30 minutes)</b></p>   | <p><b>Before beginning work:</b></p> <ul style="list-style-type: none"> <li>• Ensure students have a strategy to add and/or round multiples of the same amount</li> </ul>   |
| <p style="text-align: center;"><b>Activities During Work Period</b></p> <p>Ask – “Who has had to buy something, or share your money with a group of friends? Tell us about it?”</p> <ul style="list-style-type: none"> <li>• After 2-3 students share their experiences, show Poster - <b>What Should We Buy?</b></li> </ul> <p>Ask the students; “How many different combinations (or sets) of choices can you find that the group can afford?. When they have finished, they should check their answers with a calculator and record them as well beside their estimates.</p> <p><b>NOTE: For groups that are doing the calculations without including the tax, they can be told that the restaurant is having a special “Tax Free” day.</b></p>  | <p><b>Supply a Variety of Tools:</b></p> <ul style="list-style-type: none"> <li>• Students in pairs or small groups</li> <li>• Chart paper, markers, “play money”, calculators (for the end of the activity)</li> </ul> |
| <p style="text-align: center;"><b>Assessment</b></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"> <li>• Are they using math vocabulary? (<i>dollars, amount, total, value, worth, etc.</i>)</li> <li>• Are they able to round accurately?</li> <li>• How do they make choices about which items they can afford?</li> <li>• How do students organize their written communication? (chart, table, diagram, concrete-style pictures, etc.)</li> <li>• Two items on the board cost the same amount. What strategy to students use? Do they multiply or use repeated addition?</li> <li>• Pay attention to any observations students make regarding addition of tax</li> </ul> | <p>Make note of which students are coping easily with the activity and which ones need additional support. – select at least one of each group to share at the end of the activity.</p>                                 |

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

#### Activity

Bring the class back together.

Ask – “What was difficult about this problem? What strategies did your group use to make it easier?”, “When did you add the tax? Did you add it to each item at the beginning, or calculate it for the total, at the end?”

- Post one groups work and ask; “What strategies did this group use to help them solve the problem? Turn and talk to a partner.” Teacher – listen in as partners share. Invite students to share their thinking. This activity provides students with an opportunity to notice how other students communicated their thinking. Prompt with “What did they do that made it easy to understand their strategy?”
- If some groups used inefficient strategies for rounding the same-priced items, make sure you have someone who used an effective strategy share

#### Follow up

Have students work independently.

- Orally, or in their math journals or workbooks have students respond to the questions “What did you learn from today’s problem?”
- **Day 2** – review concepts, Challenge them to choose a flyer and estimate at least 2 different groups of items they could buy for \$20. (Students will need to record the items and prices, or hand in the flyer with their work. Add the challenge, “How much change will they receive with each order? What combinations of coins and bills could make the change?”

- Flyers from fast food restaurants or grocery stores
- Math workbooks, journals or both

#### Day 2

- New flyers, catalogues, “play” money

#### Assessment

Check student results for the Follow up activity.

- Which students have understood the concept, and which will need further practice?
- Did the student round/estimate successfully? If not, what was the source of the difficulty?
- Are students using appropriate math language in their responses?

Note any skills or math terms which need to be reviewed.

# What Should We Buy?

Five people have \$22.00 to share. What could they buy? (with 13% tax, without tax)

|  |   |
|--|---|
| <p><b>1</b> <b>DOUBLE CHEESEBURGER</b><br/>with MED FRIES and MED DRINK</p>  <p><b>\$3.79</b></p>     | <p><b>2</b> <b>BACON CHEESEBURGER</b><br/>with MED FRIES and MED DRINK</p>  <p><b>\$3.59</b></p>      |
| <p><b>3</b> <b>FRIED CHICKEN SANDWICH</b><br/>with MED FRIES and MED DRINK</p>  <p><b>\$4.29</b></p> | <p><b>4</b> <b>4 PIECE CHICKEN STRIPS</b><br/>with MED FRIES and MED DRINK</p>  <p><b>\$3.79</b></p> |