Real-World Math: Solving Multi-Step Money Problems

Topic

Applying addition, percentage calculation, and rounding to solve a real-world shopping scenario.

Grade Level / Audience

Grades 4-7 / Learners needing practice with multi-step word problems involving decimals and percentages.

Time Allotment

30-45 minutes

Learning Objectives

By the end of this lesson, the learner will be able to:

- Add two or more decimal numbers to calculate a subtotal.
- Convert a percentage to a decimal.
- Calculate the sales tax for a given subtotal and tax rate.
- Round a decimal number to the nearest hundredth (cent).
- Combine steps to calculate the grand total of a purchase.

Materials Needed

- Pencil or pen
- Paper, notebook, or whiteboard
- Calculator (optional, for checking work)
- **Optional Extensions:** Play money, real grocery store flyers, real (non-perishable) food items.

Lesson Plan

1. Introduction (5 minutes)

Hook

Ask the learner: "Have you ever bought something from a store, like a snack or a toy? When you get to the register, the price you pay is almost always a little higher than the price tag says. Why do you think that is?"

Guide the discussion to the idea of "tax" – a small extra amount of money that goes to the government to pay for things like roads, schools, and parks. Explain that today, we're going to become expert

shoppers and learn how to calculate the final price of items, including tax, so we always know if we have enough money.

State the Objectives

"Today, we are going to learn how to solve a common real-world math problem. We will learn how to add item prices to get a **subtotal**, how to calculate the **sales tax**, and how to find the **grand total** you actually pay at the register."

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2. Body: Content & Practice (20-25 minutes)

Part A: I Do - Modeling the Process (5-7 minutes)

"I'm going to show you how to solve a shopping problem step-by-step. Let's pretend I'm buying a book for **$8.25** and a marker for **$1.50**. The sales tax where I am is **5%**."

1. **Find the Subtotal:** "The first step is to find the subtotal. That's just the cost of all the items added together before tax. I'll line up the decimal points to add correctly."

   ```
     $8.25
   + $1.50
   -------
     $9.75  <-- This is our subtotal.
   ```

2. **Calculate the Sales Tax:** "Next, I need to find the tax. To do math with a percentage, we first turn it into a decimal. To change 5% to a decimal, we move the decimal point two places to the left. So, 5% becomes **0.05**."

   "Now, I multiply the subtotal by the tax decimal."

   $9.75 (subtotal) × 0.05 (tax) = **$0.4875**

3. **Round to the Nearest Cent:** "Our money system only goes to two decimal places (cents). So we need to round $0.4875. We look at the third decimal place, which is a 7. Since 7 is 5 or greater, we round up the second decimal place. So, our tax is **$0.49**."
4. **Find the Grand Total:** "Finally, I add the subtotal and the sales tax together to get the grand total—the amount I'll actually pay."

   ```
     $9.75 (subtotal)
   + $0.49 (tax)
   -------
    $10.24  <-- This is our grand total!
   ```

Part B: We Do - Guided Practice (7-10 minutes)

"Great! Now let's solve Kyra's problem together. Here's the information again:"

- Cake Mix: $5.99
- Cereal: $3.99
- Sales Tax: 2%

Question 1: What is the subtotal?

"What's the very first step we need to do?" (Wait for learner to say "add the prices"). "Exactly! Let's do that now."

$5.99 + $3.99 = ?

Answer: $9.98

Success Criteria Check: The learner correctly adds the two decimals.

Question 2: How much is the sales tax?

"Okay, we have our subtotal of $9.98. What's the next step for calculating the tax?" (Wait for learner to mention the percentage). "Right, we need to work with the 2% tax. How do we write that as a decimal?" (Guide them to 0.02). "Perfect. Now what do we do with that decimal and our subtotal?" (Wait for "multiply").

$9.98 × 0.02 = ?

Answer: 0.1996

"We can't pay $0.1996. How do we round this to the nearest cent?" (Guide them to look at the third digit, 9, and round up).

Rounded Answer: $0.20

Success Criteria Check: The learner correctly converts the percent, multiplies, and rounds the result.

Question 3: What is the grand total?

"We're on the last step! We have the subtotal and the tax. What do we do now?" (Wait for "add them together").

$9.98 (subtotal) + $0.20 (tax) = ?

Answer: $10.18

Success Criteria Check: The learner correctly adds the subtotal and tax to find the final answer.

Part C: You Do - Independent Practice (5-8 minutes)

"You did an amazing job with that! Now it's your turn to be the expert shopper all by yourself. Solve this problem. Take your time and remember the steps."

Scenario: You are buying a bottle of juice for **$2.85** and a bag of chips for **$4.50**. The sales tax is **7%**.

1. What is the subtotal?
2. How much is the sales tax?
3. What is the grand total?

(Allow the learner time to work independently. Observe their process.)

3. Conclusion (5 minutes)

Review and Recap

Once the learner has finished the 'You Do' problem, review the answers together.

- Subtotal: $2.85 + $4.50 = **$7.35**
- Tax: $7.35 × 0.07 = $0.5145, which rounds to **$0.51**
- Grand Total: $7.35 + $0.51 = **$7.86**

Ask the learner to summarize the process in their own words:

- "What is the first thing you always do in these problems?" (Find the subtotal).
- "What are the two steps to calculate the tax?" (Change percent to a decimal, then multiply).
- "What is the very last step?" (Add subtotal and tax).

Connect to the Real World

"Now you have a real superpower! The next time you're at a store, you can estimate the final cost of items in your head. This helps you make sure you have enough money and are being a smart consumer."

Assessment

- **Formative:** Observe the learner's responses and thought process during the 'We Do' guided practice. Are they able to identify the next step? Can they explain why they are doing it?
- **Summative:** The learner's ability to correctly solve all three parts of the 'You Do' independent practice problem demonstrates mastery of the learning objectives.

Differentiation & Extensions

- **Scaffolding for Struggling Learners:**
  - Provide a calculator for all calculations to focus on the process.
  - Use simpler numbers (e.g., items cost $5.00 and $3.00, and the tax is 10%).
  - Use physical play money to count out the costs and tax.
- **Extensions for Advanced Learners:**
  - Introduce a discount. "You have a coupon for 15% off the subtotal. Calculate the discount first, then the tax on the new subtotal, and then the final price."
  - Provide a real grocery store flyer and a budget (e.g., "$20.00"). Ask the learner to pick out items they can afford, calculating the total with tax to make sure they stay within budget.
  - Work backwards: "Kyra's final bill was $15.75 after a 5% sales tax was added. What was her subtotal before tax?"