

# Party Time: Computation and Estimation with Decimals

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**Strand:** Computation and Estimation

**Topic:** Solving practical problems involving decimal estimation and computation

**Primary 2023 SOL:** **5.CE.3 The student will estimate, represent, solve, and justify solutions to single-step and multistep problems, including those in context, using addition, subtraction, multiplication, and division with decimal numbers.**

- a) Apply estimation strategies (e.g., rounding to the nearest whole number, tenth or hundredth; compatible numbers, place value) to determine a reasonable solution for single-step and multistep contextual problems involving addition, subtraction, and multiplication of decimals, and single-step contextual problems involving division of decimals.
- d) Solve single-step and multistep contextual problems involving addition, subtraction, and multiplication of decimals by applying strategies (e.g., estimation, modeling) and algorithms, including the standard algorithm.
- e) Solve single-step contextual problems involving division with decimals by applying strategies (e.g., estimation, modeling) and algorithms, including the standard algorithm.

## Materials

- Bundle of Books advertisement (attached)
- Party Time! activity sheet (attached)
- Pencil and paper for each student
- Calculator
- Large paper and markers for each small group

## Vocabulary

*budget, difference, product, quotient, sum, estimate, rounding*

## Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Bundle of Books
  - a. Tell the students that they have \$50 to spend on new books for the classroom. Display the Bundle of Books advertisement. Have students read the flyer, and ask them to think about books they would like to purchase for the classroom.
  - b. Ask students, “How would you estimate the cost of three dictionaries?” Allow students to share their responses and strategies for estimating. Then have students estimate what books on the list they might purchase without exceeding the \$50 allotment. While students are estimating, circulate and ask students questions about their estimates: “How did you estimate your book totals?” “What operations

*did you use?”* Allow students to share their estimates with the class. Ask, *“Who thinks their estimate is close to \$50?”* Determine who is closest to \$50 without going over.

- c. Have each student compute the actual cost of the books they selected and the amount of money that would be left over. Then ask them to compare their estimates to their actual book amounts. Allow students to share their results with the class.
2. Party Time
- a. Tell the students that they will be planning an end-of-the-year party for the class, and they have \$100 to spend on food, decorations, and games. Distribute the Party Time! activity sheet, which lists the cost of each item. Working with partners, have students list the items they would select for the party. Have them use estimation to stop when they think they are close to the \$100 total. Ask students to exchange papers and compute the actual cost of the party and the amount of money left over. Determine who came closest to spending all the money without going over.
  - b. Have partners/small groups depict their party budgets on large butcher or chart paper. Post the budgets around the classroom and allow members of each group to explain their budgets to the class and share how they came up with their estimates.
  - c. Decimal Division: Present students with the following situation: “It cost \$2.40 for a pack of serving forks, and each pack has 6 forks. How would you figure out the cost of one serving fork?” Allow partners to discuss and work out this problem, and then have volunteers share their solutions with the class. Have students then complete the chart in part B of the Party Time! activity sheet, showing their computation on a separate sheet.
3. Bring closure to the activity by posing questions such as, *“When you go shopping, what do you need to consider when estimating to find the total cost?”* and *“What are some reasons that an estimate might be less than an exact cost?”*

### Assessment

- **Questions**
  - How does your estimate compare to your actual amount? Why do you think you are over the exact cost? Under the exact cost?
  - When planning your party, which operations did you need to use? Why?
  - When did you need to use more than one operation?
  - How does estimating the cost help with the exact cost?
- **Journal/writing prompts**
  - Describe the steps you took in planning your party and identify the operations you used.
  - What did you learn about budgeting as you planned your party? For example, was it hard or easy to stay within your budget? What things did you have to change or go without? Which items do you wish you could purchase and why?
- **Other Assessments**

- While students work on their party purchases, circulate around the room, and observe. What estimation strategies are students using? Are students demonstrating an understanding of each of the operations? Are they understanding the problem and using reasonable operations to get to correct solutions?
- Have students calculate how much it would cost for each party guest when given a set budget amount. For example, if the given budget is \$100, and 28 people were to attend the party, about how much could be spent on each guest?

### **Extensions and Connections**

- Suppose your budget was increased to \$150. How would you adjust your spending for the party?
- What other items would you need for your party that are not included on the Party Time! list? Search through catalogs and sale flyers for the prices of these items and adjust your budgets to include them for your party.
- Have students search the internet to select items to decorate a new bedroom. Purchases can include furniture, electronics, or other items the students would like in the room. Keep a record of the purchases on a chart. Calculate totals and subtract from a given budget. Have students also determine how many hours of work it would take to pay for the items, given different hourly wages.

### **Strategies for Differentiation**

- Use grid paper to assist students in lining up vertical columns.
- Some students may need to have the items followed by the cost in a list rather than a brochure.

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

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## Party Time!

Name \_\_\_\_\_ Date \_\_\_\_\_

- A) You have \$100.00 to spend on items of your choice for an end-of-the-year party for our class. Use the chart below to budget for your party. Show your work on a separate sheet.

Number of students in our class: \_\_\_\_\_

### Food

Hot dogs	\$2.00 each
Soft drinks	\$3.99 per 10-pack
Cookies	\$2.99 per dozen
Napkins	\$1.30 for a package of 100
Paper plates	\$3.00 for a package of 20
Chips	\$1.87 per bag
Fruit salad	\$4.12 per gallon
Cake (large)	\$12.57

### Decorations

Helium balloons	\$6.79 per dozen
Streamers	\$0.79 per package
Plain balloons	\$1.19 per 100

### Games

Ring Toss	\$7.43
Charades	\$3.84
Beanbag toss	\$6.29

<u>Item Selected/ Estimated Price</u>	<u># Of Items Needed</u>	<u>Estimated Total</u>	<u>Actual Total</u>
<b><u>TOTAL COST OF PARTY:</u></b>			

B) Several party items are sold in multipacks. How much would single items cost? Show your work below or on a separate sheet of paper and complete the chart below.

<b>Price for Multipacks</b>	<b>Price for a single item</b>
Cookies: \$4.44 per dozen	Cost of 1 cookie:
Plates: \$3.00 for 20	Cost of 1 plate:
Napkins: \$2.75 for 100	Cost of 1 napkin:
Drinks: \$3.99 for 10	Cost of 1 drink: