iMath Readers

Stir It Up:
Mixing Decimals

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Math Objective

Children multiply decimal numbers by rewriting them as fractions. They also use partial products to multiply. Children understand and use the Distributive Property. They learn to use an algorithm to perform the operation of multiplication. Children also add and subtract decimals.

iMath Discover Activity

Using their imaginations, children use real or play money to run a pretend lemonade stand. Children pull money out of a grab bag to find to factors. They multiply the factors to find a product.

➤ Objectives

Children will:
• read and write decimal numbers.
• count and write money amounts.
• find decimal factors.
• multiply the decimals to find a product.
• choose a strategy: rewriting numbers as fractions, modeling partial products, using the Distributive Property, using an algorithm.
• check their work with a calculator.

Materials

- play money (use real coins from a piggy bank for the cents)
- a paper bag
- calculator
- paper and pencil

Lesson Plan

Before Reading

Investigation	Math Concepts
Ask children to look at the picture on pp. 4–5. Read the text. Ask: *Have you run a lemonade stand or volunteered somewhere where you had to take and give change?* Record children's answers on the board.	Connecting to what they know helps children engage in the topic.
Ask: *Do you feel comfortable multiplying decimal numbers? How could you improve this skill? What did Aleta plan to do?* Record children's answers on the board.	Accessing prior knowledge gets children to think about and engage with the topic.

Children read about Aleta who wants to run a lemonade stand. They learn about multiplication of decimal numbers and different strategies to help Aleta become comfortable with multiplying decimals.

During Reading

Investigation	Math Concepts
pp. 6–9: Read p. 6 aloud. As you read, talk the class through the process of writing decimal numbers as fractions and multiplying them. Then, change the numbers and let volunteers work the new problem on the board. Distribute grid or graph paper and colored pencils or markers. Use an overhead projector or computer to display the grid on p. 7. Have children recreate the grid using colored pencils. Write the problem on the board and let volunteers solve it. Read p. 8 aloud and work through the problem demonstrating the Distributive Property on the board. Change the dollar amount and let children work the new problem on paper. Have them check each other's work. Read p. 9 aloud. Ask: What is an algorithm? Record children's answers and correct misunderstandings. Invite volunteers to write and solve the problem on the board.	Children add, subtract, multiply decimals, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Children graph partial products to multiply.
pp. 11–12: Have volunteers read these pages aloud. Then, ask: *What are some things Aleta should consider before going to the store?* Record children's answers on the board.	Children analyze, evaluate, and predict the needs of a real-world situation.

During Reading (continued)

Investigation	Math Concepts
pp. 13–15: Have a volunteer read p. 13 aloud. Write the weight and cost of the lemons on the board. Then, ask: *How do we rewrite the decimal numbers as fractions and multiply?* Refer children back to p. 6. Have them work the problem at their desks. Walk around and check their understanding. Then, have a volunteer write the problem on the board and solve it. Read p. 14 aloud. Write the problem on the board and distribute graph paper. Have children solve the problem using the method on p. 7. Let children check each other's work. Invite a volunteer to read p. 15 aloud. Write the problem on the board and have a volunteer work it.	Children rewrite decimals as fractions and multiply. They use partial products to multiply and represent the partial products on different areas of a grid.
pp. 16–17: Say: *Let's brainstorm some ideas. What will Aleta need to run a lemonade stand?* Record children's answers on the board. Read pp. 16–17 aloud. Have children work the problem on p. 17. Invite a volunteer to solve the problem on the board.	Children convert a percentage to a fraction and then to a decimal number and use the Distributive Property to multiply.
pp. 18–19: Read p. 18 aloud. Let children work the problem on this page. Refer them back to p. 9 if necessary. Ask: *After you find the product, what do you need to do to place the decimal point?* (Count the number of digits in each factor that are to the right of the decimal point.) Read p. 19 aloud. Have children work the problem and share their answers. Ask: *Why is it so important to recycle paper products?*	Children understand what an algorithm is and use it to multiply decimal numbers. They learn how to multiply decimals and count to find how many decimal places should be added to the product.
pp. 20–21: Invite a volunteer to read p. 20 aloud. Ask: *Would an algorithm work well here? How would we set the problem up?* Let children work the problem on paper. Check their work. Invite a volunteer to read p. 21 aloud. Ask: *What would be the best way to work this problem? Would you use the Distribute Property or would you use an algorithm?*	Children understand what an algorithm is and use it to multiply decimal numbers. They learn how to multiply decimals and count to find how many decimal places should be added to the product. Children understand and use the Distributive Property.

During Reading (continued)

Investigation	Math Concepts
pp. 22–25: Read p. 22 aloud. Ask: *Why do you think pink lemonade turned out to be so popular?* Read p. 23 aloud. Have children solve the subtraction problem. Ask: *Why is a new car that doesn't work well called a lemon?* Invite volunteers to read pp. 24–25 aloud. Write the subtraction problem on the board. Have children work the problem on paper. Then, have a volunteer complete the problem on the board.	Children add, subtract, and multiply decimals.
pp. 26–29: Read p. 26 aloud. Refer back to p. 8 if necessary. Demonstrate how to work the problem on the board. Let children guide you through the problem. Read p. 27 aloud. Ask: *Can you think of some other wise sayings or proverbs?* (Look before you leap, Don't count your chickens before they hatch, All's well that ends well, etc.) Have children read pp. 28–29 silently. Encourage children to discuss the text. Ask: *How long has lemonade been made by humankind? Where is Egypt in relation to Burma? How did lemons probably get from Burma to Egypt?*	Children understand and use the Distributive Property.
pp. 30–33: Read p. 30 together. Write the problem on the board and talk children through working it. Have children subtract to find Aleta's per-batch profit. Read p. 31 aloud. Have children write an algorithm to solve the problem at the bottom of the page. Invite volunteers to write their problems and solutions on the board. Read p. 32 aloud. Have children write the subtraction problem and check each other's work. Have children read p. 33 silently. Ask: *How is running a lemonade stand like running a restaurant?*	Children add, subtract, and multiply decimals.

During Reading (continued)

Investigation	Math Concepts
pp. 34–36: Read p. 34 aloud. Ask: *How do we write the six percent sales tax as a decimal?* (0.06) Have children pair up to solve the problem. Then, write the problem on the board and demonstrate how to solve it. Read p. 35 aloud. Have children continue to work in pairs to solve the problem on p. 35. Invite a volunteer to read p. 36 aloud. Write the algorithm on the board. Have children work the multiplication problem on paper. Remind them that they must count the decimal places in the factor and transfer them to the product. Have a volunteer complete the problem on the board.	Children convert a percentage to a decimal number and write an algorithm and multiply.
pp. 37–38: Have children read these pages silently. Ask: *Why does the grandmother want some lemons? What was the total profit from the lemonade stand after you subtract costs for supplies and ingredients?*	Children read with comprehension. They subtract decimal numbers.
pp. 39–41: Read p. 39 together. Challenge children to work the sales-tax problem in their heads. Read pp. 40–41 aloud. Have children find what the six percent tax on $4.40 would be.	Children convert a percentage to a decimal and do mental multiplication.
pp. 42–44: Cluster children into small groups. Have them read these pages silently. Then, children should work together to understand Aleta's email point by point. Have children use pp. 6–9 if they need coaching.	Children add, subtract, multiply decimals, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
p. 45: Work with children individually to help them run through the people they might interview. Encourage them to make a list of their own questions to ask.	Children analyze, evaluate, and plan. They brainstorm and think creatively.

After Reading

Ask children to restate the key ideas in the book.

Investigation	**Understanding Math**
Have children write a proposal for a small business they might want to start. It might be a lemonade stand, a jewelry-making business, or a service, like lawn care. Children should research cost of supplies and other details to include in their proposal.	Children find the cost of materials and supplies for a potential business. They add, subtract, and multiply decimals. They write a reasoned proposal.
Have children pretend to run a business using play dollars and real coins. Children should total sales and figure sales tax at six percent.	Children practice real-world use of operations involving decimals.