

Lesson Title: Mental Multiplication Designer: Diane Hunter
Discipline: Math Grade Level: 4-5

Activity 1: Strategy Boxes

(Appropriate for AFTER the Broadcast Lesson)

Activity Goal: Explain a strategy to mentally solve a multiplication problem; during the game: draw lines on graph paper to create boxes; if a player draws the last line to close a box--that is theirs (put initial beside the box to indicate the player who closes the box).

Targeted Math Skills: Find multiple strategies for decomposing numbers and mentally solving them.

Materials: Multiplication expressions (attached), graph paper or blank paper to make dots on (sample board attached), 2 colored pencils, and a writing utensil (pencil).

Steps:

1. Take turns looking at a multiplication problem and solving it mentally.
2. One person describes a strategy. If the strategy makes sense to the other player, player 1 gets to draw a line. Repeat for player 2. Use the same problem until no new strategies are described.
3. Repeat for a new problem.
4. After 5 problems, see who has enclosed more boxes and that is the winner.

Questions to Consider:

1. How were you able to think about the numbers to solve?
2. Could there be a way to use 10s to help make it easier?
3. Which strategy would you choose if you had to choose one?

Activity 2: Decomposing strategy preference

(Appropriate for AFTER the Broadcast Lesson)

Activity Goal: Explore different ways to decompose numbers and explain why one may be more effective than another.

Targeted Math Skills: Recognize the varied ways of decomposing numbers to make them more manageable.

Materials: Strategy cards (see below), and a writing utensil (pencil).

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Steps:

1. Choose a strategy card and look at the strategies chosen to solve for the product.
2. Analyze the strategies and choose which one seems to be the most efficient and/or effective.
3. Explain your thoughts (orally) to a trusted adult or another person.

Questions to Consider:

1. What about this strategy is appealing to you?
2. Was there something about the other strategy that was unappealing?

Further Extension:

1. What is a strategy that you think someone would come up with?
2. Why do you think someone might prefer this strategy as opposed to the one you selected?

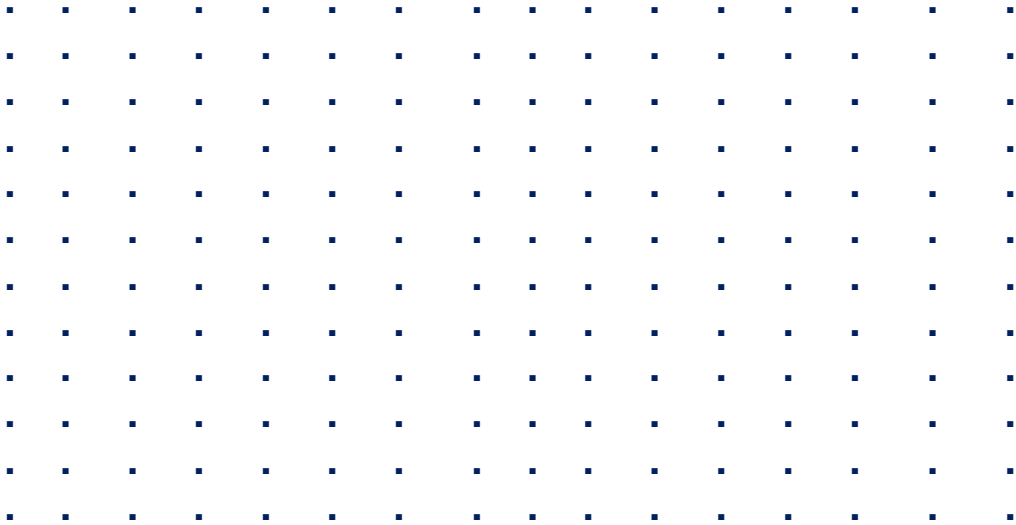
Additional Resources for Lesson-Related Extension Activities:

- **Helpful Tips:** Allow additional time for the student to think. Decomposing numbers and thinking about what makes sense to one person takes time.
- **Student-Facing and/or Teacher-Facing:**
 - Video Tutorial: Composing & Decomposing Numbers (Build Math Minds) - <https://www.youtube.com/watch?v=r7Wr8spVu28>
 - Supplemental Lesson/Resource (Build Math Minds - <https://www.therecoveringtraditionalist.com/composing-and-decomposing-numbers/>)
- **Teacher-Facing:**
 - Supplemental Resource/Video Tutorials/Practice Sets (Brown Bag Teacher) - <https://brownbagteacher.com/number-talks-how-and-why/>
 - Supplemental Resource Video Tutorials & Practice Sets (Inside Mathematics) - <https://www.insidemathematics.org/classroom-videos/number-talks>
 - Supplemental Resource/Practice Sets (Peregian Spring - Queensland) - <https://peregianspringsss.eq.edu.au/Supportandresources/Formsanddocuments/Documents/mental-strategies-for-multiplication-and-division.pdf>
 - Supplemental Video Tutorial - Number Talks (Henry County Mathematics) <https://www.youtube.com/watch?v=X18cQkKMIhs>

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Activity 1 Materials

- Sample board:



- Multiplication expressions:

17x4	23x2
16x3	33x5
41x3	26x4
45x3	15x6

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Activity 2 Materials

- Strategy cards:

<p style="text-align: center;">16x5</p> <p>1. $(10+6) \times 5$ $10 \times 5 + 6 \times 5$ $50 + 30$ 80</p> <p>2. $(15+1) \times 5$ $15 \times 5 + 5$ $15 \times 2 = 30$ $30 + 30 + 15 = 75$ $75 + 5 = 80$</p>	<p style="text-align: center;">22x4</p> <p>1. $(20+2) \times 4$ $20 \times 4 = 80$ $2 \times 4 = 8$ $80 + 8 = 88$</p> <p>2. $(11 \times 2) \times 4$ $11 \times (2 \times 4)$ 11×8 88</p>	<p style="text-align: center;">32x4</p> <p>1. $(15 \times 4) + (15 \times 4) + (2 \times 4)$ $15 \times 2 = 30$ $15 \times 4 = 60$ $60 + 60 + (2 \times 4)$ $120 + 8$ 128</p> <p>2. $(30 \times 4) + (2 \times 4)$ $30 \times 4 = 120$ $2 \times 4 = 8$ $120 + 8$ 128</p>
<p style="text-align: center;">25 x 5</p> <p>1. $(20 \times 5) + (5 \times 5)$ $100 + (5 \times 5)$ $100 + 25$ 125</p> <p>2. $(25 \times 4) + 25$ $100 + 25$ *I thought of quarters and I know that 4 quarters is \$1.00</p>	<p style="text-align: center;">18 x 7</p> <p>1. $(10 \times 7) + (8 \times 7)$ $70 + (8 \times 7)$ $8 \times 8 = 64$ $64 - 8 = 56$ $70 + 56$ $70 + 30 = 100$ $100 + 26 = 126$</p> <p>2. $(9 \times 7) + (9 \times 7)$ $63 + 63$ $60 + 60 = 120$ $120 + 3 + 3 = 126$</p>	<p style="text-align: center;">42 x 6</p> <p>1. $(40 \times 6) + (2 \times 6)$ $240 + (2 \times 6)$ $240 + 12$ 252</p> <p>2. $(40 \times 5) + 40 + (2 \times 6)$ $200 + 40 + (2 \times 6)$ $240 + (2 \times 6)$ $240 + 12$ 252</p>