Practice Task: Multiplication Three in a Row

STANDARDS FOR MATHEMATICAL CONTENT

MCC5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

This game can be made available for students to play independently. However, it is important for students to share some of the strategies they develop as they play more. Strategies may include:

- estimating by rounding the numbers in Box A
- multiplying tens first, then ones; for example, 47 x 7 = (40 x 7) + (7 x 7) = 280 + 49 = 329

Be sure students know and understand the appropriate vocabulary used in this task. Provide index cards or sentence strips with key vocabulary words (i.e. factor, product). Have students place the cards next to the playing area to encourage the usage of correct vocabulary while playing the game.

ESSENTIAL QUESTIONS

- How can estimating help us when solving multiplication problems?
- What strategies can we use to efficiently solve multiplication problems?

MATERIALS

- Color Counters
- "Three in a Row" game board (printed on card stock and/or laminated for durability)
- Calculators

GROUPING:

Small Group or Partner Task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION:

In this task, students practice multiplying 2-digit by 1-digit numbers in a game format.

Comments: Being able to estimate and mentally multiply a 2-digit number by a 1-digit number is an important pre-requisite skill for dividing a whole number by a 2-digit number. Helping students develop their mental computation or estimation abilities in general is also an important focus of Grade 4 GPS. As students play this game, encourage students to try mental computation and explain strategies. It is important to remind them that they can use the calculator **only after** they announce their products. Remember that we want students to use estimation skills and mental math strategies to multiply a 2-digit number by a 1-digit number

KEY TO THREE IN A ROW GAME

79x25 *or* 25x79 **1,975**	91x76 *or* 76x91 **6,916**	232x802 *or* 802x232 **186,064**	472x32 *or* 32x472 **15,104**	91x802 *or* 802x91 **72,982**	18x512 *or* 512x18 **9,216**
18x802 *or* 802x18 **14,436**	232x32 *or* 32x232 **7,424**	472x76 *or* 76x472 **35,872**	35x512 *or* 512x35 **17,920**	232x25 *or* 25x232 **5,800**	18x97 *or* 97x18 **1,746**
91x97 *or* 97x91 **8,827**	79x512 *or* 512x79 **40,448**	18x25 *or* 25x18 **450**	232x76 *or* 76x232 **17,632**	79x32 *or* 32x79 **2,528**	35x802 *or* 802x35 **28,070**
79x76 *or* 76x79 **6,004**	472x25 *or* 25x472 **11,800**	472x97 *or* 97x472 **45,784**	35x97 *or* 97x35 **3,395**	232x512 *or* 512x232 **118,784**	91x32 *or* 32x91 **2,912**
18x32 *or* 32x18 **576**	79x97 *or* 97x79 **7,663**	472x512 *or* 512x472 **241,664**	79x802 *or* 802x79 **63,358**	18x76 *or* 76x18 **1,368**	35x25 *or* 25x35 **875**
91x512 *or* 512x91 **46,592**	472x802 *or* 802x472 **378,544**	35x32 *or* 32x35 **1,120**	91x25 *or* 25x91 **2,275**	232x97 *or* 97x232 **22,504**	35x76 *or* 76x35 **2660**

Task Directions

Students will follow the directions below from the "Three in a Row" game board.

This is a game for two or three players. You will need color counters (a different color for each player), game board, pencil, paper, and a calculator.

Step 1: Prior to your turn, choose one number from Box A and one number from Box B. Multiply these numbers on your scratch paper. Be prepared with your answer when your turn comes.

Step 2: On your turn, announce your numbers and the product of your numbers. Explain your strategy for finding the answer.

Step 3: Another player will check your answer with a calculator after you have announced your product. If your answer is correct, place your counter on the appropriate space on the board. If the answer is incorrect, you may not place your counter on the board and your turn ends.

Step 4: Your goal is to be the first one to make "three-in-a-row," horizontally, vertically, or diagonally.

FORMATIVE ASSESSMENT QUESTIONS

- Who is winning the game? How do you know? What do you think their strategy is?
- Is there any way to predict which factors would be best to use without having to multiply them all?
- How are you using estimation to help determine which factors to use?
- How many moves do you think the shortest game of this type would be if no other player blocked your move?

DIFFERENTIATION

Extension

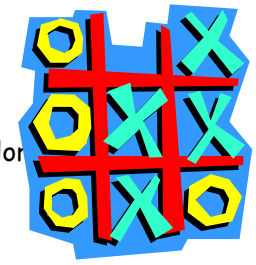
- A variation of the game above is to require each player to place a paper clip on the numbers they use to multiply. The next player may move only one paper clip either the one in Box A or the one in Box B. This limits the products that can be found and adds a layer of strategy to the game.
- Another variation is for students to play "Six in a Row" where students need to make six products in a row horizontally, vertically, or diagonally in order to win.
- Eventually, you will want to challenge your students with game boards that contain simple 3-digit numbers (e.g. numbers ending with a 0 or numbers like 301) in Box A or multiples of 10 (i.e., 10, 20, … 90) in Box B. As their competency develops, you can expect them to be able to do any 3-digit by 2-digit multiplication problem you choose.

Intervention

- Allow students time to view the game boards and work out two or three of the problems ahead of time to check their readiness for this activity.
- Use benchmark numbers in Box A, such as 25, 50, 100, etc.

Name _____ Date _____

Three in a Row Game Board



This is a game for two or three players. You will need color counters (a different color for each player), game board, pencil, paper, and a calculator.

Step 1: Prior to your turn, choose one number from Box A and one number from Box B. Multiply these numbers on your scratch paper. Be prepared with your answer when your turn comes.

Step 2: On your turn, announce your numbers and the product of your numbers. Explain your strategy for finding the answer.

Step 3: Another player will check your answer with a calculator after you have announced your product. If your answer is correct, place your counter on the appropriate space on the board. If the answer is incorrect, you may not place your counter on the board and your turn ends.

Step 4: Your goal is to be the first one to make "three-in-a-row," horizontally, vertically, or diagonally.

Box A					Box B				
18	232	35 91	472	79	25	32	512 97	76	802

1,975	6,916	186,064	15,104	72,982	9,216
14436	7424	35872	17920	5800	1746
8827	40448	450	17632	2528	28070
6004	11800	45784	3395	118784	2912
576	7663	241664	63358	1368	875
46592	378544	1120	2275	22504	2660