

How Many More Like to Dance?

Fourth Grade + Math and Dance
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CORE SUBJECT AREA

Math

ART FORM + ELEMENTS

Dance

Body

Space

Energy

MSCCR STANDARDS

4.NBT.5

MSCCR CREATIVE ARTS STANDARDS

DA: Pr4.1.4 Select, analyze, and interpret artistic work for presentation. Make static and dynamic shapes with positive and negative shape. Perform elevated shapes (jump shapes) with soft landings and movement sequences alone and with others, establishing relationships with other dances through focus of eyes.

DURATION

60 Minutes

OBJECTIVES

Students will be able to know and/or do...

1. The student will be able to clearly identify place value of 1's, 10's, and 100's and how to reflect these in increasing levels (low to high), size (small to big/low to high energy), and body parts (one to whole body).
2. The student will understand how to use expanded form in a multiplication equation and how to use a rectangular array to solve a multi-digit multiplication equation.
3. The student will understand the difference between movement/action and stillness/shape.
4. The student will solve a rectangular array equation and use a combination of movement and shape to show his or her answer.

MATERIALS NEEDED

CD, boombox, drum, numbered placemats (1 – 9/1's and 10 – 90/10's, 100 – 500/100's), rectangular array charts (15), numbers for multiplication equations (2 per group; 30 total), posters with expanded form & rectangular array examples, pencils (15)

VOCABULARY

Product, Rectangular arrays, Area models

RECOMMENDED RESOURCES

The warm-up, brain dance, can be found on www.wigglegenius.com

LESSON SEQUENCE

Affective Hook:

“Who likes to travel? When you take a trip, who needs places and things to look for, so they don't get lost? How we get there and the steps we take on the journey can help us make sure we arrive at our destination. This is true for traveling, and it is also true for math. Today we will be solving multiplication equations using a rectangular array. This is a specific way to get an answer to a multiplication equation, but it is a great way to do it.

Relevance:

It is important to be able to measure or identify things exactly but also know certain procedures for arriving at an answer. By dancing place values, and translating this to expanding a number, and then using a rectangular array to solve a multiplication equation, we will put math in our bodies and understand it from a different perspective – we will take the scenic route to our destination!”

Introduction of Participation Expectations

“This is a special kind of class. You need to give me your full attention and do your best to watch me as I teach. In a movement class, you follow-the-leader and what you see me do as much as you listen to what I am saying and follow spoken directions. You also want to be spatially aware and respectful of those around you. Keep your body to yourself and stay safe in your movement above all else – there is no room for horseplay if we are going to get to everything that we have planned! We will be working together in teams for part of this class, which is important to know how to do well, and I will be asking for volunteers to help me be leaders and demonstrators as well. I always choose students who are paying attention and eager to try things. Make it clear to me if this is you from the beginning of class, so I notice you and ask you to help me teach! Finally, we have a special “cue” for attention in class because we are moving a lot. Doing a hand signal doesn’t work. (Model call-and-response and have students practice it several times). Any questions? Now we are ready to go.” The TA will lead students in the warm-up focusing on level, size, and body parts vs. the whole body.

BrainDance:

breath, tactile, expand/contract, head/tail, upper/lower, right/left, cross lateral, vestibular.

Discussion:

The TA will lead students in discussion afterwards asking students to identify examples of movement that were high/low, big/small, and used the whole body or just a body part. She will explain to students that this is the kind of movement they will use in the lesson to show their equations at the end of class. Review of Academic Concept: Place Value The TA will write a number on the board (857) and ask for student volunteers to identify the place value of each (1’s, 10’s, 100’s). She will review with students that the value of each number depends on its place in the value. She will share that it is important to know place value to know how much a number is worth but also for us to be able to use expanded form to solve multi-digit multiplication problems using a rectangular array later in the lesson.

Investigation of Concept: Place Value ·

Level Demonstration:

Select students’ placemats will be numbered 1 – 9 (by 1’s). The TA will ask these students to come to the front of

the room and serve as volunteers. The TA will arrange them in order, smallest value to largest (1 – 9). She will then ask students to show a graduated change in levels that reflect these values starting with 0 on the floor and 9 reaching as high as possible/jumping. Student volunteers will be thanked and asked to return to their place.

Size Demonstration:

Select students’ placemats will be numbered 10 - 90 (by 10’s). The TA will ask these students to come to the front of the room and serve as volunteers. The TA will arrange them in order, smallest value to largest (10 – 90). She will then ask students to show a graduated change in size of movement (i.e. bounce) that reflect these values starting with 0 hardly moving and 100 moving as large as possible. Student volunteers will be thanked and asked to return to their place.

Body Parts Exploration:

Select students’ placemats will be numbered 100 – 500 (by 100’s). The TA will ask these students to come to the front of the room and serve as volunteers.

The TA will arrange them in order, smallest value to largest (100 – 500). She will instruct the 100 to move only one body part, the 200 to move two, the 300 to move three, the 400 to move four, and the 500 to use their whole body in movement. Review of Academic Concept: Rectangular Arrays The TA will explain that a rectangular array is a specific way to solve a multi-digit multiplication equation, involving using expanded form and columns and rows to multiply. The TA will ask students to trace a line with their finger side to side and simultaneously say “row” and trace a line up and down and say “column.” She will share the poster on expanded form and refer to identifying and separating numbers out in terms of place value as the central part of this process. Development of Concept: Solving a Rectangular Array Equation The TA will show how she solved the rectangular array shown on the poster (see equation below) and explain to students that in their culminating activity they will do the same and show their equation through movement and shapes.

$$\begin{array}{cccccccccc}
 10 & & 3 & 10 & & 100^* & & 30^* & & 100 + 30 = 130^* & 4 & & 40^* & & 12^* & & 40 + 12 \\
 = 52^* & & & & & & & & & & & & & & & & & 130 + 52 = 182
 \end{array}$$

Culmination of the Concept:

Dancing a Rectangular Array Equation Students will be divided into groups of 4-5. Each group will receive two multi-digit numbers and a rectangular array (blank) chart that they will use to solve the equation (the two numbers can be put in any order, determining whether they are listed in a row (first number) or column (second number)). The TA will then direct students in the group to show the equation only: the first number, the second number, and the answer. They will use movement to show the numbers, and shapes to show the multiplication and equals sign along with the final answer. The movement can be anything, but will involve body parts (the 1’s) and whole body movements (the 10’s). For example: the number “13” will be shown with one movement using the whole body, followed by three movements using one body part. In other words, both place value and the actual value of each number will be shown. The students will be directed to stand in the order of the equation (a line) and either assign specific people to each part of the equation or do every part of it as a group. The final

answer, using body shaping, must use all people in the group, so combining people to make one number might be necessary depending on the size of the group. The following equations will be distributed (the correct answers are written here but are not shared with students).

Group 1: 56×77 (4321)

Group 3: 25×81 (2025)

Group 2: 42×73 (3066)

Group 4: 23×69 (1587)

The groups will be given five minutes to solve their equation and show their work (written) on the rectangular array. They will then create the movement and shapes needed to dance this equation. The TA will ask for groups to volunteer to show their equation dances to reinforce expectations.

Closure:

The TA will reiterate the importance of using place value to identify the value and function (in expanded form) of numbers and the process of a rectangular array. She will thank students for their enthusiasm, creativity, and energy in the learning process.

EXTENDED LEARNING ACTIVITIES

3~2~1: Have students write the following:

3 movement strategies you learned from today's lesson that will help you compare decimals
2 things you enjoyed most from today's lesson
1 thing you still need practice/clarification on

SOURCES

Lesson Written by Julie White; www.wigglegenius.com. Lesson edited and updated by Melissa Tingle.

TIPS + FREQUENTLY ASKED QUESTIONS

Open space (if desk or chairs are in the way, these are to be moved to the walls of the room to create open space)