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| **Lesson Plan:** “TIME to Divide!” | **Room Requirements & Arrangement:** 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) |
| **Content Area & Arts Discipline:**  Math and Dance  |  |
| **Overview of the Lesson:**  Review the process of the dividing fractions and using a reciprocal fraction to accomplish this. An investigation of time (even, uneven, fast, and slow) as well as non-locomotor movement will allow dancers to show and solve these equations through dance | **Materials/Equipment:** CD, boombox, poster showing a division fraction equation with a reciprocal fraction highlighted, handouts with numbered movement (6), group equations (6 copies), pencils (6)**School:** Saltillo Elementary School, Saltillo, MS & Oakland Heights Elementary School (MAAE) |
| **Grade Level:** 5th Grade | **Date Lesson Created:** 2015 |
| **Proposed Time Frame:** 45 minutes | **Lesson Author:** Julie White  |

**Big Ideas & Learning Objectives**

1. The student will review the process of dividing fractions and will demonstrate this clearly through movement.
2. The student will correctly identify denominators, numerators, and a reciprocal fraction and use this knowledge to create a “fraction equation dance.”
3. The student will clearly demonstrate an understanding of time (dance element) in movement: fast, slow, even, uneven. The student will apply this understanding to the process of dividing equations and showing the many parts involved (numerator, denominator, reciprocal fraction).
4. The student will work cooperatively, respectfully, and creatively with their peers throughout instruction.

**Procedures**

***Affective Hook*:** Why is it important for us to know how to tell time? That’s right – it helps us to be on time to important things. Can we be late to school? Can we be late to a flight? No. We will miss the opportunity to learn and travel and we might deal with other consequences too like losing a lot of money or not going to the attendance party! In dance, we use time to change how movement looks and feels to do. It takes something simple and makes it more interesting or complex, just like combining two numbers in fractions give us different possibilities in math. Today, the idea of “time” in our bodies will help us show how to correctly divide fractions.

***Relevance*:** It is important to understand how things work. By using the concept of time, and doing this through movement, we will review the right way to divide fractions. By understanding how to dance “time,” we will understand how to use this dance element to make movement more interesting and intentional.

***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. 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 (define a good volunteer). 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 (model call-and-response and have students practice it several times). Any questions? Now we are ready to go.*

***Warm-up*: *BrainDance***

Follow my lead but feel free to explore. We will be moving in all different kinds of ways in the warm-up. Do your best to do everything clearly. We will do the warm-up in place.

* Breath -- float
* Tactile – brush, tap, squeeze, pitter-patter
* Core/Distal – reach and melt
* Head/Tail – vibrate
* Upper/Lower -- bend, bounce, jump
* Right/Left – swing and shake
* Cross Lateral -- twist
* Vestibular – spin and punch

***Discussion:*** *During the warm-up we did many different types of movement. Later in our lesson we will be using most of these to create a fraction dance. We will also use them as a way to explore time when dancing.*

***Activity One (Introduction of Movement Concept): Even & Uneven Rhythms***

**Circle Clap**

The students will be asked to make a large circle. The teacher will then explain to students that they will repeat the rhythm or the movement that the teacher does going around the circle, one person at a time, and they want to try their best to keep an even (same amount of space between each beat) rhythm as they go.

* Clap
* Hop
* Spin
* Everyone says their first name
* Volunteer student’s movement choice
* Volunteer student’s movement choice

**Rhythm Orchestra**

The students will be asked to return to their personal spaces and have a seat. The teacher will divide the room in half, asking the students to remain facing front. She will then ask one side of the room to clap an even rhythm and the other side to clap an uneven rhythm. She will give students these rhythms and practice them individually before combining them. She will then ask for student volunteers to offer even and uneven rhythms, will teach each side their part (switching roles for each half), and “conduct” the orchestra. In other words, when she points to a side they clap. When she points to them again they stop. The students thus create a “spontaneous rhythm score” with their assigned time. The teacher will compare the two sides of the room to the numerator and the denominator and point out the relationship that they have with one another: having different functions and numbers but working as a whole. Time allowing, the teacher will then ask students to replace clapping with any chosen movement that can be done in the same tempo and in the same rhythm.

***Activity Two (Exploration of Movement Concept): Review of the Reciprocal Fraction***

The teacher will explain to students what “polyrhythmic” means in dance (having two different rhythms that occur simultaneously in the body). She will ask students to show bend, twist, and punch and ask them to do these in a different way and different body part. She will then ask students to combine them so that they happen simultaneously (one in the upper body, one in the lower).

* punch (upper), bend (lower)
* twist (upper), punch (lower)

The teacher will then ask students to switch the movements that happen in their lower and upper bodies. She will let them know that this is called “transposition” in dance, but for today, represents a reciprocal fraction. She will lead students in the first example, and then give them a moment to figure out the second example on their own. Additionally, she will encourage creative movement and take a moment to point out examples among students.

***Activity Three (Development of Movement Concepts): Review of Division of Fractions***

The teacher will hold up a poster with the following fraction equation written on it:

2 : 1 = 8

3 4 3

She will then show students how ¼ flips upside-down to become 4/1 so that it can then be multiplied with the first fraction to determine the answer to the division equation. She will remind students that when writing the final fraction equation that the reciprocal fraction must be written in its original form once again.

***Activity Four (Culmination of Combined Academic and Movement Concepts): Dancing a Devision Fraction Equation!***

The students will be divided into groups of 5 – 6. Each group will be given a pencil, a movement handout with words assigned to each number 1 - 10, and the division fraction equation just discussed (example) above. They will be directed to work together to use movement in body halves and time (speed) to dance the equation. They will be directed to:

* Identify the movement assigned to each number and decide HOW to show this movement
* Create and show the reciprocal fraction with assigned movement (representing given numbers in the equation)
* Practice doing one movement in the upper body (numerator) and a different movement in the lower body (denominator)
* Physically represent the division and equals sign through body shaping
* Show the division equation in order (reciprocal fraction follows the second fraction)

The teacher will then ask the group to manipulate one fraction with speed. The larger number needs to be done very fast/quickly and the smaller number (in the fraction) needs to be done very slow/slowly.

Each group will then show their equation as the teacher reads it aloud and guides the pace of the “performance.” Observing students will be asked to comment on the clarity and correctness of the movement and the math involved. The teacher will share performance/audience expectations before showings, and affirm quality participation in this activity afterwards.

***Differentiated Learning for Culminating Activity***

* *Below Grade Level: Complete all requirements but do not add in time/speed.*
* *On Grade Level: Complete all the requirements, and clearly perform time/speed.*
* *Above Grade Level: Complete all the requirements, perform with energy and confidence and clearly defined time/speed, but also apply speed to two or more fractions.*

***Closure***

Today we reviewed denominators, numerators, and the reciprocal fraction. We used polyrhythmic movement to represent the fraction and movement in the upper and lower body to show how a fraction “flips” when dividing fractions. We also used the element of time (specifically fast and slow, but also even and uneven rhythms) to show numerical value and place in a fraction. Remember that how we solve a problem helps us to arrive at the correct answer sometimes, both in life and in math. Knowing how to do this matters. The teacher will thank the students for their efforts and their creativity.

**Movement Chart**

1. Whirl
2. Swing
3. Punch
4. Melt
5. Shake
6. Twitch
7. Bend
8. Twist
9. Bounce
10. Jump

Equation

2 : 1 = 8

3 4 3