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| **Lesson Plan:** “Building a Strong Foundation” | **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 adding and subtracting unlike fractions and the process of finding a common denominator and associated multiplication involved in this. An exploration of weight supports, weight sharing, body shaping, and levels will be used to kinesthetically represent the above, and reinforce the importance of a common denominator.  | **Materials/Equipment:** CD, boombox, poster on common denominators, poster showing addition/subtraction fraction equation with uncommon denominators equation, individual fraction equations for group work (6), 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 adding and subtracting fractions with uncommon denominators and will demonstrate this clearly through movement.
2. The student will correctly identify denominators, numerators, and the process of finding a common denominator through multiplication.
3. The student will use weight supports to demonstrate figured common denominator multipliers, explore various forms of weight sharing (partner) to represent the importance and function of common denominators, and creatively demonstrate each of these in a given final fraction equation (group work).
4. The student will work cooperatively, respectfully, and creatively with their peers throughout instruction.

**Procedures**

***Affective Hook*:** Who has someone they can count on in life? Who has someone that you love but drives you crazy in some way, but because you love them you work to get along, find common ground, or work problems you might have out? Today we are learning about adding and subtracting fractions with uncommon denominators. In order to do this correctly and clearly, we need to find a common denominator and we do this using multiplication. A common denominator allows us to complete this kind of equation, and is similar to have a strong base of operations in our lives. We need a firm foundation to move forward with confidence.

***Relevance*:** It is important to understand how things work. By using the concepts of weight supports and body shaping, we will be able to review, and learn in a new way through movement, the right way to add and subtract unlike fractions. By understanding how to effectively share weight, we will also directly experience how important balance and equivalency is in a relationship, and apply this to common denominators (dancing) and beyond – to relationships in life (discussion).

***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
* Tactile
* Core/Distal
* Head/Tail
* Upper/Lower
* Right/Left
* Cross Lateral
* Vestibular

***Discussion:*** *During the warm-up we did many different types of movement. Some happened in our upper bodies, some happened in our lower bodies, some happened using our whole bodies. Most movements can also be done on a high level or on a low level. Today we will be using levels to help us demonstrate the solution to our fraction equation problem.*

***Activity One (Introduction of Movement Concept): Finding a Common Denominator***

The teacher will hold up a poster that has the following numbers written on it:

8 4 (2)

5 10 (2)

3 9 (3)

3 12 (4)

2 8 (2)

6 3 (2)

She will then ask students to help her figure out the multiplier needed to make both numbers equal (written in parentheses…these numbers will be written on the poster/board as students offer them). She will explain that this is the process used to find a common denominator when adding and subtracting unlike fractions. She will then ask the students to represent these numbers by using a body part to support weight. Example: “2” gets two supports…one hand and one foot. The students will try all the above multipliers using weight supports. The teacher will encourage students to be creative and may even set limitations on movement choices to encourage this (i.e. don’t use your hands!)

***Activity Two (Exploration of Movement Concept): Weight Sharing***

Adding and subtracting unlike fractions requires a common denominator. We just reviewed using a multiplier to achieve this, but now we will explore a few weight sharing exercises to “feel” this balance and help us to remember that this is central to us being able to solve this kind of fraction equation. The teacher will clearly and firmly review expectations for appropriate touch with students and explain how important this is for both safety and trust – weight sharing doesn’t work if the other person can’t count on you to do your part. The teacher will ask students to find a partner and try the following (she will also model these with a student volunteer if appropriate):

* Facing each other, palm to palm, pressing hands together to sense weight
* Facing each other, one foot away from each other, palm to palm, and leaning towards and away from each other by bending the elbows. The body stays in one long line (don’t break at the waist or hips) and “tips” forward and back.
* Facing each other, holding each other’s wrists, the students lean away and towards each other, keeping the body in one long line. They then pull away and “sit” and “stand back up” while pulling away. By holding the other person’s weight, this movement does not require a lot of muscling. By being balanced in their push and pull, the pair will not tip over.
* Back-to-back, the students will press their full backs (shoulders to pelvis) together and slowly walk their feet away from each other so that they lower themselves to a seated position and stand back up

The teacher will need to give individualized feedback to students to ensure safety and function in weight sharing. Partners should also be similar in height and size to allow for the easiest weight sharing possible. Weight sharing takes practice and is also a great exercise to do simply to build trust among students.

***Activity Three (Development of Movement Concepts): Showing the Answer with Body Shaping***

The students will be asked to return to their personal spots and have a seat. Low and high level will be reviewed, but this time with body shaping. The students will be asked to represent several numbers with a body shape at high level. They will be asked to do the same at low level. The teacher will then ask for a student volunteer to demonstrate a fraction (i.e. 4/9) that shows this clearly and correctly.

***Activity Four (Culmination of Combined Academic and Movement Concepts): Show me a Multiplier and Your Answer!***

The students will be divided into groups of 5 – 6. Each group will be given a pencil and an addition or subtraction equation using unlike fractions. They will be asked to figure the multiplier that needs to be used to find a common denominator and make up a shape that uses this number of weight supports. Each group member can make a different shape but use the same number of supports. She will then ask the group to solve the fraction equation and share the “answer” through the use of body shaping at low and high levels that physically represents the final fraction. During this work time, the teacher will visit each group to ensure that the equations were solved correctly and also confirm the movement requirements for this activity. The students will perform these for their peers, with observing students giving feedback on creativity and clarity in given answers (as evidenced in movement). The teacher will share audience/performer expectations prior to student showings of work.

Equations given to groups:

3 + 8 = 1 + 1 =

8 4 6 3

1 - 1 = 3 + 1 =

5 10 10 2

1 - 5 = 5 - 1 =

2 12 8 2

***Differentiated Learning for Culminating Activity***

* *Below Grade Level: Complete one of the two requirements.*
* *On Grade Level: Complete all the requirements, demonstrated through unison movement choices.*
* *Above Grade Level: Complete all the requirements, perform with energy and confidence, and share a diversity of movement solutions for each part of the equation.*

***Closure***

Today we reviewed how to find a common denominator, how to use a multiplier in the process of adding and subtracting unlike fractions, and how to show this with weight supports and body shaping at different levels. We also took a moment to explore weight sharing and what it feels like to have an “equal” base of support. This is essential in this type of fraction equation and by trying this out in our bodies, it will help us remember that this must be a part of things as well as the difference it makes – if they aren’t equal, we will fail and fall in our attempts to solve the equation. The students will be thanked for their efforts and their creativity!