UNIT: FRACTION FUSION–WHERE ART AND NUMBERS COLLIDE
FRACTIONS IN MOTION
Grade Band: 4
Content Focus: Dance & Math

LEARNING DESCRIPTION

In this lesson, students will create addition equations using fractions with like denominators. They will work in groups to express this equation in written form and through a movement sequence. The lesson will close with a self-reflection on the project.

LEARNING TARGETS

Essential Questions	"I Can" Statements
What different types of body shapes, levels, and movements can I use to express a mathematical concept like adding fractions? How can I represent the addition of fractions with like denominators?	I can create and express a fraction addition problem (with like denominators) in a written equation and a movement sequence that utilizes body shapes, levels, and different types of movements.

GEORGIA STANDARDS

Curriculum Standards	Arts Standards
4. NR.4.6 Add and subtract fractions and mixed numbers with like denominators using a variety of tools.	ESD4.CR.1 Demonstrate an understanding of the choreographic process. ESD4.CN.3 Integrate dance into other areas of knowledge.

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
4.NSF.3 Develop an understanding of addition and subtraction of fractions (i.e., denominators 2, 3, 4, 5, 6, 8, 10, 12, 25, 100) based on unit fractions. a. Compose and decompose a fraction in more than one way, recording each composition and decomposition as an addition or subtraction equation; b. Add and subtract mixed numbers with like denominators; c. Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having like denominators.	**Anchor Standard 1:** I can use movement exploration to discover and create artistic ideas and works. **Anchor Standard 2:** I can choreograph a dance. **Anchor Standard 7:** I can relate dance to other arts disciplines, content areas, and careers.

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
• Fraction - A number that represents a part of a whole • Numerator - The number above the line that indicates how many parts of a whole are being counted • Denominator - The number below the line that indicates the total number of equal parts in the whole • Addition - Combining two or more numbers to find a total or sum • Equation - A mathematical sentence that has two equal sides separated by an equal sign	• Movement sequence - A series of movements; a short dance • Levels - One of the aspects of movement (there are three basic levels in dance: high, middle, and low) • Body shape - Refers to an interesting and interrelated arrangement of body parts of one dancer; the visual makeup or molding of the body parts of a singular dancer; the overall visible appearance of a group of dancers (they may be curved/angular, symmetrical/asymmetrical, positive/negative) • Locomotor movement - A movement that travels through space

• Equivalent – Have equal value • Like denominator – A denominator that is found in two or more fractions • Unlike denominators – Denominators in two or more fractions that are different from each other	• Non-locomotor movement - A movement that does not travel through space (e.g. shaking, bending, stretching, twisting, turning & more)

MATERIALS

- Upbeat instrumental music
- Speaker or other device with the ability to play music
- Index cards with various fractions written on them (grouped in pairs by fractions with like denominators)

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

Move It! Shape It!

- Provide a vocabulary word or concept to express through movement (see below).
- When the music plays, students move in their personal space, to express vocabulary given.
  - Upbeat instrumental music is best.
- When the music stops, students will freeze in a body shape.
- Repeat as needed.

***Vocabulary to utilize**: Numerate, denominator, addition, towards, away, equation, various locomotor movements, various non-locomotor movements, low level, middle level, high level*

Work Session

- Review adding fractions with like denominators.
- Divide the class into groups of three to four students.
  - Give each group a pair of fraction cards.
  - Each group will write an addition equation with their fraction cards including the sum.
  - Each group will choreograph a movement sequence that expresses their equation including the following:
    - Movement for Fraction A
    - Movement for Fraction B
    - Movement for the sum
    - At least two non-locomotor movements
    - at least one locomotor movement
    - All three levels (high, middle, and low)
- After designated work time, all groups will have a 'dress rehearsal'. (All groups will perform at the same time and may need two dress rehearsals so that the teacher can assess their work.)

- After the performances, have each group share their equation.
- Review audience etiquette with students: Still, silent, supportive.
- Invite groups that would like to perform their dance for the whole class to do so.
  - Students can comment on:
    - Interesting movements
    - Where they saw certain sequence requirements, etc.
    - How the group used the dance concepts to communicate the mathematical concepts

Closing/Reflection

- Have students complete the following Exit Ticket by answering one or more of the following reflection prompts/questions:
  - Describe how your movements expressed the fraction addition equation.
  - What was the easiest and most challenging part of this task?
  - What did your group do to be successful in this project?
  - What would you change or improve to be more successful?
  - Describe what you learned in this project.

ASSESSMENTS

Formative

- Teacher observation of students during “Move It! Shape It!” to check for understanding of vocabulary
- Individual group check-ins during group work time
- Exit Ticket

Summative

Checklist for ‘Fraction Addition Equation and Movement Sequence”:

- Was the fraction addition equation written accurately?
- Was the sum of the fraction equation correct?
- Did the movement sequence include a movement for each part of the equation? (Fraction A, Fraction B, and Sum)
- Did the sequence include at least two non-locomotor movements?
- Did the movement sequence include at least one locomotor movement?
- Did the movement sequence include all three levels (low, middle, and high)?

DIFFERENTIATION

Acceleration:

- Include mixed fractions
- Reduce group size

Remediation:

- Simplify fractions given
- Intentional grouping
- Model an example as a class

ADDITIONAL RESOURCES

CREDITS

U.S. Department of Education- STEM + the Art of Integrated Learning
Ideas contributed by: Christopher Crabb

**This integrated lesson provides differentiated ideas and activities for educators that are aligned to a sampling of standards. Standards referenced at the time of publishing may differ based on each state's adoption of new standards.*