WE ARE THE PARTS
Grade Band: 4-5
Content Focus: Theatre & Math

LEARNING DESCRIPTION

In this lesson, students will use their bodies and space, working together to create visual and corporal models to investigate and represent equivalent fractions.

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can I demonstrate equivalent fractions using my body?	I can use my body and work with others to create visual representations of equivalent fractions. I can identify and articulate equivalent fractions.

GEORGIA STANDARDS

Curriculum Standards	Arts Standards

We bring learning to life.

Grade 4	Grade 4
4.NR.4: Solve real-life problems involving addition, subtraction, equivalence, and comparison of fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 100 using part-whole strategies and visual models. **Grade 5** 5.NR.3: Describe fractions and perform operations with fractions to solve relevant, mathematical problems using part-whole strategies and visual models.	TA4.PR.1 Act by communicating and sustaining roles in formal and informal environments. b. Use body and movement to communicate a character's thoughts and emotions. c. Collaborate and perform with an ensemble to present theatre to an audience. **Grade 5** TA5.PR.1 Act by communicating and sustaining roles in formal and informal environments. b. Use body and movement to communicate thoughts, ideas, and emotions of a character. c. Collaborate and perform with an ensemble to present theatre to an audience.

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
Grade 4 4.NSF.1 Explain why a fraction (i.e., denominators 2, 3, 4, 5, 6, 8, 10, 12, 25, 100), a/b , is equivalent to a fraction, $n×a$ $n×b$, by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. **Grade 5** 5.NSF.1 Add and subtract fractions with unlike denominators (including mixed numbers) using a variety of models, including an area model and number line.	**Anchor Standard 3:** I can act in improvised scenes and written scripts.

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
● Denominator – The bottom number in a fraction, indicating how many total equal parts in the whole ● Equivalent Fractions – Fractions that have the same value, though they have different numerators and denominators	● Collaborate/Collaboration – Teamwork, working together in a group ● Pose – A positioning or shape of the body

- **Fraction** – A numerical value that is part of a whole, indicating a certain number of parts of an equally divided whole

- **Numerator** – The top number in a fraction, indicating how many of the total parts are present or included.

MATERIALS

Optional: Paper and pencils for drawing the extension activity

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

- Teach and lead the students in playing Countup, a listening game in which the group tries to count as high as possible, one number per person, randomly, without duplication.
  - Leader (teacher) gives a cue (e.g., "Ready, Set, Go!"), then someone says "1," then someone else says "2", and so on. If two people say a number at the same time, the round ends and the game reverts to the beginning, back to 1.
  - If a pattern emerges (e.g., three players start alternating numbers), the round is stopped and a new one begins.
  - After the game is established, give volunteers the opportunity to give the starting cue.
  - Once students understand the game, emphasize the listening aspect, and the fact that the class will not necessarily get farther by going faster.
  - After playing with cardinal numbers, explore variations through other sequences. Move into odd/even numbers and multiples (of 3, 5, 10, 4, 6, etc.).
  - Then move into fractions: Unit fractions (1/2, 1/3, 1/4, 1/5, etc.), the complements of unit fractions (1/2, 2/3, 3/4, 4/5, etc.), and equivalent fractions (1/2, 2/4, 3/6, 4/8, etc.; 1/3, 2/6, 3/9, 4/12, etc.).

Work Session

EQUIVALENT FRACTION POSES
- Tell students that they will be using their bodies to create poses that represent equivalent fractions.
- Review equivalent fractions with students.

Creating Halves
- Have two students come to the front or the center of the room, ideally where they can sit on the ground and be seen by all.
- Have them sit cross-legged facing each other. Explain that together, their upper legs form a whole square, and their lower legs bisect the square, or cut it in half.
  - Have each student say, "I am one half."

- Have the two students place one arm with the elbow at their navel and the arm extended out to the center. Point out that each half has been cut in half, and the resulting parts are fourths of the whole.
  - Have each student say, "I am two fourths."
  - Point out that by splitting the space in half, the students are effectively multiplying the number of parts by two – both the number of parts each student represents and the number of parts overall.
    - This is the same as multiplying both the numerator and the denominator by the same number to get an equivalent fraction.
- Have the students use both arms, with elbows on thighs and fingertips to the center, to trisect the shape defined by their legs. Point out that each half has been cut in thirds, resulting in six parts all together. Have each student say, "I am three sixths."
- Have all the students pair up and find a place in the room to repeat the sequence – "I am one half," "I am two fourths," "I am three sixths."
- Reflect and discuss how and why the fractions described by the parts created are equivalent.

Creating Thirds
- Have the students form groups of three. Rather than sitting cross-legged, have them sit so that their bodies form a single triangle.
- Repeat the process with the further divisions of the parts, and the accompanying lines, "I am one third," "I am two sixths". Challenge students to see how many equivalent fractions they can make.
- Have students describe fractions made by combining parts. For example, "Giselle and I are two thirds," "Giselle and I are four sixths," "Mariah and I are six ninths."
- *If the class does not divide evenly into threes, assign the extra student or two to other groups and have them ask prompting questions, e.g., "Terence, what part are you?" "Abby and Lucas, what part are you?"*

Beyond Thirds
- Continue the process with even larger groupings.
- Each time, have students seat themselves on the ground with their legs to the side and their feet together. (As the numbers grow larger, the angle formed by each child's legs grows smaller, and the distance to stretch the arms toward the center grows greater.)
- Have students articulate their fractions; then, add an arm to bisect the part, and then two arms. As the groups grow, the number of groups will get smaller but the number of extra students who can be assigned to ask questions will increase.

Closing/Reflection

- Have the students reflect on how they used their bodies to create the fractions, and how they used their voices to name their values.
- Ask students to reflect on the activity with the following questions:
  - What are equivalent fractions?
  - Who can give an example of equivalent fractions?
  - When you were sitting on the floor, how did you use your bodies to show equivalent fractions?" ("We stretched out our arms to divide the parts.")
  - "With numbers in your minds or on paper, how do you find equivalent fractions?" ("We multiply the numerator and the denominator by the same number.")

ASSESSMENTS

Formative
Teachers will assess students' learning by observing students' participation in creating equivalent fractions with their bodies and students' responses to class discussion.

Summative
CHECKLIST ● Students can accurately define, create, and identify equivalent fractions. ● Students can form equivalent fractions by creating poses with their bodies.

DIFFERENTIATION

Acceleration:
- Have students imagine and articulate fractions with greater numerators and denominators, beyond what is apparent in their positions. E.g., when in groups of 3, call out a higher denominator, such as 12, or a higher numerator, such as 5, and have students identify the fractions they represent with those values.
- Have students draw a picture of one of their groups as if looking down from the ceiling. Label the classmates in the group. Write sentences naming the fractions they represent (e.g., "Alberto is one fifth," "Cameron is two tenths," "Alberto, Cameron and Jade are nine fifteenths," etc.).

Remediation:
- Build the Count-up game slowly. Use a fishbowl process to have a smaller group play the game while others watch, and rotate students through the activity.
- Limit the process to fractions involving halves and thirds.

ADDITIONAL RESOURCES

- [PBS Learning Media – Rise and Shine Math Time: Equivalent Fractions video (5:10 mins.)](#)

artsNOW

We bring learning to life.