

MULTIPLICATION/DIVISION HULA
Grade Band: 2-3
Content Focus: Theatre & Math



LEARNING DESCRIPTION

In this lesson, students will be empowered by seeing their physical bodies solve multiplication and division problems. They will step into the world of “math stories” to enact and solve math problems. Allowing students to become part of the equation in real time enables them to better visualize problem solving methods.

LEARNING TARGETS

Essential Questions	“I Can” Statements
How can acting and movement help us understand multiplication and division?	I can solve and write “math stories”/multiplication and division problems using hula hoop visualization.
How are multiplication and division related?	I can create and perform my own “math story”/multiplication and division problems using acting.

GEORGIA STANDARDS

Curriculum Standards	Arts Standards
<p>Grade 2: 2.NR.3: Work with equal groups to gain foundations for multiplication through real-life, mathematical problems.</p> <p>Grade 3: 3.PAR.3: Use part-whole strategies to solve real-life, mathematical problems involving multiplication and division with whole numbers within 100. 3.PAR.3.2 Represent single digit multiplication and division facts using a variety of strategies. Explain the relationship between multiplication and division. 3.PAR.3.4 Use the meaning of the equal sign to determine whether expressions involving addition, subtraction, and multiplication are equivalent. 3.PAR.3.6 Solve practical, relevant problems involving multiplication and division within 100 using part-whole strategies, visual representations, and/or concrete models.</p>	<p>Grade 2: TA2.PR.1 Act by communicating and sustaining roles in formal and informal environments.</p> <p>Grade 3: TA3.PR.1 Act by communicating and sustaining roles in formal and informal environments.</p>

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
<p>Grade 3: 3.ATO.1 Use concrete objects, drawings and symbols to represent multiplication facts of two single-digit whole numbers and explain the relationship between the factors (i.e., 0 – 10) and the product. 3.ATO.2 Use concrete objects, drawings and symbols to represent division without remainders and explain the relationship among the whole number quotient (i.e., 0 – 10), divisor (i.e., 0 – 10), and dividend. 3.ATO.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is a missing factor, product, dividend, divisor, or quotient. 3.ATO.6 Understand division as a missing factor problem.</p>	<p>Anchor Standard 3: I can act in improvised scenes and written scripts.</p> <p>Anchor Standard 8: I can relate theatre to other content areas, arts disciplines, and careers.</p>



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KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none">● <u>Multiplication</u> - Creating or counting equal groups; a mathematical operation where a number is added to itself a number of times● <u>Division</u> - To break apart into equal parts or groups● <u>Dividend</u> - The number that is being divided● <u>Divisor</u> - The number you divide by● <u>Quotient</u> - The answer to a division problem	<ul style="list-style-type: none">● <u>Theater</u> - Dramatic literature or its performance; drama● <u>Character</u> - A person, an animal or other figure assuming human qualities, in a story● <u>Body</u> – An actor’s tool, which we shape and change to portray the way a character looks, walks, or moves● <u>Dialogue</u> – Conversation between characters● <u>Scene</u> – The dialogue and action between characters in one place for one continuous period of time● <u>Ensemble</u> - All the parts of a thing taken together, so that each part is considered

MATERIALS

- 5-10 hula hoops

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

- Start with a general physical warm-up to get the students' bodies ready. Use exercises such as:
 - **Stretching:** Stretch all major muscle groups.
 - **Shaking Out Limbs:** Shake out arms, legs, and the whole body to release tension.
 - **Energy Passes:** Stand in a circle and pass a clap or a simple motion around to build group focus and energy.
- Ask students what some of their favorite stories are—movies, TV shows, books, etc. Ask students to share what they like about them—the characters, story, etc.?
 - Tell students that today, they will be looking at math like a story with characters, a setting, a problem, and a solution.



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Work Session

- Begin by creating a vocabulary movement for each mathematical symbol that students will use in the lesson. Change the pitch of your voice every time that you say the word.
 - Example vocabulary movements:
 - “=” equals to (forearms horizontal and parallel in front of body)
 - “+” to add to (forearms in a cross in front of body)
 - “-” to take away (right forearm in front of body and swipes down right)
 - “x” groups of (forearms in an ‘x’ in front of body)
 - “÷” to break apart (forearms together with balled fists on either side of middle, then fists separate to the side)
 - Show each movement and ask students to guess which part of the math story you are acting out. Once the students guess, draw the operation on the board.
 - Practice making the movements and saying their meanings with students.
- Introducing “Math Lands”:
 - Tell students that there are different “lands” or settings in which the math stories take place.
 - First, there is Addition Land, where we add to and take away from/subtract. Only addition and subtraction take place in Addition Land.
 - Characters in Addition Land:
 - Sum – Answer to the addition problem
 - Difference – Answer to the subtraction problem
 - There is also Multiplication Land, where we count groups of numbers and also break numbers apart into groups/division.
 - Characters in Multiplication Land:
 - Quotient – Answer to the division problem
 - Product – Answer to the multiplication problem
 - Dividend – The number that is being divided first
 - Divisor – The number going into the dividend; it breaks up the number
 - Tell students that division does not live in Addition Land and subtraction does not live in Multiplication Land.
 - Now, introduce the other characters that can go to both Addition and Multiplication land, zero and one. Tell students that they will act differently depending on which land they go to.
 - ZERO:
 - Zero is the “nobody” of Addition Land because when it is added to or taken away from a number, the number doesn’t even think anything happened. It just shrugs and walks away unchanged.
 - But, if zero goes to Multiplication Land, look out! It feels very powerful as it annihilates anybody it comes into contact with! Any number multiplied by “0” equals zero!
 - ONE:
 - On the other hand, one is the “nobody” of Multiplication Land. It doesn’t have any effect on anyone in this land. It’s kind of like zero in Addition Land. $5 \times 1 = 5$, $100 \times 1 = 100$, $5 \div 1 = 5$
 - Yet, when one goes over to Addition Land, it can cause numbers to subtly change. $100 + 1 = 101$, $5000 + 1 = 5001$



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- Let's live in Multiplication Land today and tell some stories from there. In this land we will talk about multiplication (groups of) and division (break apart into groups).
 - Tell students that division and multiplication are like distant relatives who live in the same land.
 - Division is the inverse or opposite of multiplication. We are breaking a number apart into groups when we divide, and we are grouping numbers when we multiply.
 - Let's look at how they are related by looking at a math story (use the hula hoops to demo the story):
 - $5 \times 2 = 10$: If we have two hula hoops on the floor, and five students in each hula hoop, how many students do we have in total? Inversely, if we have ten students and two hula hoops, how many students will stand in each hula hoop? $10 \div 2 = 5$
 - Place three hula hoops on the floor, ask six students to divide themselves equally into the three hula hoops. Write out the problem on the board: $6 \div 3 = 2$. Ask students how it could be written as a multiplication problem: $3 \times 2 = 6$. Continue to model division using this method.
 - Increase the number of hula hoops and students; for example, instruct students to evenly place 20 students into five hula hoops.
 - Write out the equations as students act them out.
 - Add interest and energy to the problems by bringing them to life through word problems. Have students physically embody/act out the objects or people in the word problems.
 - Example multiplication problems to enact:
 - There are three houses. Each house has four people living in it. How many people live in the houses? $3 \times 4 = 12$
 - If you have two boxes and put five apples in each. How many apples do you have? $2 \times 5 = 10$
 - There are four spider webs and each spider web has two spiders in it. How many spiders are there in total? $4 \times 2 = 8$
 - A tree at the park has four branches. Each branch has five birds on it. How many birds are in the tree? $4 \times 5 = 20$
 - Example division problems to enact:
 - Jerry picks twelve flowers from her garden. She wants to put the same number of flowers in each of the three vases. How many flowers should she put in each vase? Lay out three hula hoops/vases and place four flowers/students in each hula hoop/vase. $12 \div 3 = 4$
 - Barry has eight spiders to divide equally in four jars. How many spiders will be in each jar? $8 \div 4 = 2$
- Divide students into small groups. In their groups, students should write their own "math story" as both a multiplication and division problem. Students will need to determine what the hula hoops will represent and what object will be put into each hula hoop. Students should practice acting out their math story and using their bodies to become the characters in their stories.

Closing/Reflection

- Students will perform their "math stories" for their classmates. Discuss appropriate audience participation and etiquette prior to performances.



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- After each performance, the audience should be able to determine what the “math story” is showing in terms of the mathematical equation.
- The performing group should then read/show their “math story” to class.

ASSESSMENTS

Formative

Teachers will assess students’ understanding of the content throughout the lesson by observing students’ participation in the activator, ability to use their bodies to make mathematical symbols, engagement in class discussion, participation in acting out the “math stories”, and collaboration with their groups to create and perform a “math story”.

Summative

CHECKLIST

- Students can accurately solve and write “math stories”/multiplication and division problems using hula hoop visualization.
- Students can create and perform their own “math stories”/multiplication and division problems using acting.

DIFFERENTIATION

Acceleration:

- Have students turn their “math stories” into full scenes. Challenge students to include at least three different equations in their story. Students should incorporate dialogue into their scenes that explains what is occurring mathematically.

Remediation:

- Focus on multiplication in one session and division in a separate session rather than discussing them together in this lesson.
- Rather than having groups create their own equations to act out, assign equations to groups to act out.

ADDITIONAL RESOURCES

NA

**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.*

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THEATRE SMART. GUTSY. BOLD.



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