

Common Core Georgia Performance Standards

MATHEMATICS
GRADE 3

MCC3.OA.1: Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 .

MCC3.OA.2: Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.

MCC3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Georgia Performance Standards

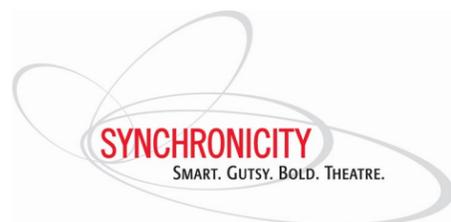
THEATRE ARTS
GRADE 4

TAES4.3: Acting by developing, communicating, and sustaining roles within a variety of situations and environments

National Standards

THEATRE ARTS

Standard 2: Acting by assuming roles and interacting in improvisations



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GRADE 3 Curriculum Guide

Multiplication/Division Hula

Visualizing Mathematics • Multiplication and Division •



Help students learn the basics of multiplication and division stories by using their bodies and voices to demonstrate the properties of math and act them out!

Student mathematicians will be empowered by seeing their physical bodies solve multiplication and division problems. They will step into the world of the Hula Hoops to help group and enact math problems. Helping students become and physically see the problems solved in real time will allow them to better visualize problem solving methods.

Essential Question: How can the process of acting increase comprehension in other subject areas?

Process

Storytelling in math

"Do you like to watch movies? Do you like to read books? What do you like about them (characters, story, etc.)? Have you ever been around someone who told a great story that drew you into the story and wanted to make you stay and listen to more?
I have. I love stories. I used to have a really hard time in math when I was your age. Then, I started to see math as one big story. It really helped me. Let's look at the language of math and tell the math stories together today."

- Give a vocabulary movement to each mathematical symbol and 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.
- Do the movement and say the meaning after drawing the operation on the board.

"That's how we tell these math stories. There are different lands in which the stories take place."

MATH LANDS:

"We have **Addition Land** (where we add to and take away from/subtract). Only addition and subtraction take place in Addition Land."

Characters:

- Sum – answer to the addition problem
- Difference – answer to the subtraction problem

"We have **Multiplication Land** (where we count groups of numbers and also break apart into groups/division). There are factors that multiply but other things go on in this land like division, powers and square roots.

Characters:

- Quotient – answer to the division problem
- Product – answer to the multiplication problem
- Dividend - The number that is being divided 1st. It should also be the biggest number depending on the equation.
- Divisor –the number going into the dividend. It breaks up the number.

"We see that some of the operations can live together in their lands, but only in specific lands. Division does not live in Addition Land and Subtraction does not live in Multiplication Land."

Other Characters

ZERO - Zero is the "nobody" of Addition Land because it goes over to, and adds with, a number and the number doesn't even think anything happened. It just shrugs and walks away unchanged. But if zero takes a vacation and goes to Multiplication Land, look out! It feels very powerful as it annihilates anybody it comes into contact with!

Any number x = 0

ONE - On the other hand, *one* is the "nobody" of Multiplication Land. It makes no difference to anybody. Doesn't change a thing. Kind of like zero in addition land, huh?

5 x 1 = 5 , 100 x 1 = 100

Yet when one goes over to Addition Land it can at least cause numbers to gently change.

100 + 1 = 101, 5000 + 1 = 5001

"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). These guys are actually related. They 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."

Materials

- 5-10 hula hoops
- Visual of 9's multiplication table

Vocabulary

Multiplication

creating or counting equal groups; a mathematical operation where a number is added to itself a number of times

Division

to break apart into equal parts or groups

Dividend

the number that is being divided

Divisor

the number you divide by

Quotient

The answer to a division problem

"Let's look at how they are related by looking at a math story (use the hula hoops to demo the story):

$$5 \times 2 = 10$$

We can now start with the quotient/answer. Let's take it and break it apart or divide it into 2 parts. How many do we have in each part/hula hoop?

Now let's tell this math division story:

$$3 \div 3 = 1$$

Or, in words, '3 broken into 3 groups'.

- Put out 3 hula hoops, ask 6 students the answer or quotient is how many are in each hula hoop or group.
- Continue to model division using students.
- Place hula hoops on the floor.
- Instruct students to evenly place 20 students into 5 hula hoops.
- Ask those students to sit down and then take away one hula hoop.
- Now ask them to evenly place 12 students in 4 hula hoops, remembering that hoops= groups.
- Repeat as needed. Have students demo these problems with the hula hoops. Add interest and energy to the problems. Have students become the objects and people and animals in word problems.

EXAMPLE MULTIPLICATION PROBLEMS TO BRING TO LIFE:

- There are 2 houses. Each house five people living in it. How many people live in the houses?
 $3 \times 5 = 15$
- If you have 2 boxes and put 5 apples in each. How many apples do you have?
 $2 \times 5 = 10$
- How many spiders do you have if you have 4 rows of 2 spiders?
 $4 \times 2 = 8$
- A tree at the park has 4 branches. Each branch has 5 birds on it. How many birds are in the tree?
 $4 \times 5 = 20$

DIVISION PROBLEMS TO BRING TO LIFE:

- Jerry pick 12 flowers from her garden. She wants to put the same number of flowers in each of the 3 vases. How many flowers should she put in each vase?
3 hula hoops/vases
4 flowers/students in each hula hoop/vase
write out problem on board ($4 + 4 + 4 = 12$)
- Barry had 8 spiders to divide equally in 4 jars. How many spiders will be in each jar?

EXTENSION: House of 9 in Multiplication Land

"There is a very special house in multiplication land that has some very unique features. It's like a riddle in the house and all of the problems multiplying this number by 1 – 10 can be solved using this riddle. It's the house of 9's in Multiplication Land."

- Show the 9 multiplication table (1-10)
- "Let's just look at the answers and cover up the problem. Look at the numbers in the answer and just those numbers. What do they equal?"
- Show this by making the answer into an addition problem. (ie. $9 \times 3 = 27$, $2 + 7 = 9$ $9 \times 4 = 36$, $3 + 6 = 9$)

"You look at the number that 9 is being multiplied by and go down one number. Then take that and see what needs to be added to it to make 9. Put those 2 numbers side by side and you have your answer."

Assessment

- Teachers should observe students, watching for involvement, engagement, and effort.
- Students should accurately solve their multiplication and division problems using hula hoop visualization.