MGSE5.NBT.3 - Video Transcript

00:01
[Opening Music]

00:16
In this video, we will deconstruct standard NF.3 of the grade 5 Georgia standards of excellence for mathematics.

00:22
This standard represents that a fraction is a way to represent the division of two quantities.

00:28
Standard NF.3 expects students to explore the concept that a fraction is a way to represent the division of two quantities.

00:35
Students are expected to demonstrate their understanding using concrete materials, drawing models, and explaining their thinking when working with fractions in multiple contexts.

00:45
They read 3/5 as “three fifths” and after many experiences with sharing problems, learn that 3/5 can also be interpreted as “3 divided by 5” and as “3 shared by 5.”

00:59
This standard calls for students to extend their work of partitioning a number line from third and fourth grade.

01:06
In third grade, NF.1 refers to the sharing of a whole being partitioned or split.

01:11
To show mastery of the third-grade standard, 3.NF.1, students should focus on the concept that a fraction is made up (composed) of many pieces of a unit fraction, which has a numerator of 1.

01:24
For example, the fraction 3/5 is composed of 3 pieces that each have a size of 1/5. And ⅖ is composed of 2 pieces that each have a size of ⅕.

01:35
In fourth grade, by using a visual such as a number line or area model, students should understand a fraction a/b as a multiple of 1/b.

01:47
The fourth-grade standard, 4.NF.4, shows students to use a visual model to represent 5/4 as the product of 5 × (1/4).

01:59
Students should be able to record the conclusion by the equation 5/4 = 5 × (1/4) and knowing that this means five groups of 1/4.

02:11
Students should also be able to relate the multiplication to repeated addition.

02:17
It is important to note that students are not required to divide fractions by fractions in fifth grade.

02:22
It is not until 6th grade when students are expected to find quotients of fractions involving division of fractions by fractions.

02:30
Van De Walle suggests that division with fractions follow a developmental progression that focuses on four types of problems.

02:37
The first type of problem is a whole number divided by a whole number. The second level is a fraction divided by a whole number.

02:45
Third, a whole number divided by a fraction. And finally, level 4 is a fraction divided by a fraction.

02:51
Level one is the focus of NF.3. It is the foundational skill that is needed for students to understand Level 2 and Level 3 which they will master in NF.7.

03:03
For more information on these levels and this standard, visit the Georgia Department of Education Mathematics website and click on Unit 4, NF.7 overview in the Fifth-grade curriculum map.

03:14
It is important to note that Level 4 should not be explored in 5th grade.

03:18
This first type of problem of the division with fractions progression that Van De Walle references is exactly what NF.3 intends for the students to be able to do and understand.

03:28
The first type of problem is a whole number divided by a whole number.

03:31

It is imperative that students are given a context when working with these types of division problems.

03:37
Most students can make sense of two friends sharing three cookies and realize that each friend will receive one whole cookie and ½ of the third cookie.

03:47
Therefore; 3 divided by 2 is 3 halves or 1 and one half.

03:52
Students should also be able to recognize the relationship of 3 times ½ is the same as three halves or one and one half.

04:00
In this grade 5 Georgia standards of excellence for mathematics framework culminating task, students are instructed to determine if each group of students received a fair amount of candy bars.

04:10
The task provides students with drawings of the candy bars that can be used to assist in the distribution of candy.

04:16
This allows for students to naturally split the candy bars and model the math that is happening.

04:20
Watch as this student works through 3 candy bars shared with four students.

04:25 (Video)
Teacher: OK. I see that you have your four students… and you have your three candy bars… and you cut these candy bars into what?
Student: Halves.
Teacher: You cut them into halves, and you gave each friend how much amounts?
Student: One-half.
Teacher: Ok. So, can you write one-half for me? You can write it at the bottom or wherever you want.
Student [Writes ½]

04:51
Teacher: Ok. And then what do you have left over here?
Student: A whole.
Teacher: You have one more candy bar and you cut it into half. Can you share those halves?
Student: Yes.
Teacher: How?
Student: By… umm… cutting them into fourths.
Teacher: Oh! Ok. Can you show me what that looks like?

05:08

Student [Divides the last candy bar into fourths]
Teacher: Oh!
Student [Then divides all candy bars into fourths.]: Now you can share it equally [Draws arrows showing which students get each fourth of the first two candy bars] Now this one gets this second one. And this one gets this second one… [then pointing to the last candy bar…] And then this one goes to this one. This one goes to this one….
Teacher: Ok. So, how much is each student getting from this candy bar [The last candy bar]?
Student: One-fourth.
Teacher: Ok. Can you put that there for me?
Student [Writes "+ ¼"]
Teacher: So, how much are they getting in all?
Student: Three-fourths.

05:48
Teacher: Now, can you write me a division problem of what you did up here? What did you share?
Student [Writes 4 ÷ 3]
Teacher: What did you share?
Student: Oh. I shared… [Erases 4 ÷ 3] … I shared 4… Well, I shared… three-fourth…
Teacher: What did you share, though?
Teacher: What did you chop up and share?
Student: Fourths?
Teacher: Here was your story. What did you share?
Student: Oh. Four candy… umm… Three candy bars.
Teacher: 3 candy bars… And what did you share those three candy bars with?
Student: 4 people.
Teacher: 4 people… And how much did they get?
Student: They got… ¾.
Teacher: ¾. What do you notice about that division problem and the fraction?
Student: That… That a division… That the division is the same thing as the fraction.
Teacher: It looks the same, doesn't it?
Teacher: You have 3 ÷ 4 is the same as ¾.

07:12
Once students determine how much each group member will receive of a candy bar, they are then required to tell if the sharing was fair.

07:18
Students were able to use fraction tiles to create number lines and determine if each group received the same amount.

07:25
Number lines helped students to make the connection that the amounts they were comparing were wholes that had been divided into equal pieces and thus resulted in a fractional quotient.

07:35
When working this problem, a student should recognize that the 7 packs are being divided into 4 groups, so s/he is seeing the solution to the following equation, 4 x n = 7 (4 groups of some amount is 7 packs) which can also be written as 7 divided by 4 equals n.

07:58
Students can draw a model to show that each student will receive one whole pack of paper.

08:03
Then, the students can divide the remaining three packs into fourths so that they can share the packs evenly with the group members.

08:10
Students should easily be able to see that each group member will receive ¼ from the additional packs; therefore, 1 + ¼ + ¼ + ¼ will give each student 1 ¾ packs of paper.

08:26
For additional support and resources, please visit Georgiastandards.org where you can find additional tasks, intervention material, and more.

08:35
[Closing Music]