

 VIDEO
6:16 min

[Full Details and Transcript](#)



Grade 5 Number Talk

Tollgate Elementary School, Colorado
February 2011

Topic DEVELOPING EFFECTIVE FRACTIONS INSTRUCTION FOR K-8

Topic OPERATIONS WITH FRACTIONS

- Highlights**
- » Fifth-grade teacher Cindy Matthews leads a lesson on adding and subtracting fractions using fraction equivalents and relationships.
 - » She leads a number talk about an authentic situation (placing homeless dogs in shelters with limited space) to encourage flexible use of fraction thinking.
 - » She demonstrates number talk techniques, including helping kids recognize when they “have a place to start” and use of models to support students’ problem solving, including use of the classroom clock as a model.
 - » Students discuss in small groups how to approach the problems.
 - » Several students describe their thinking about how to approach creating equivalent fractions while the teacher extends their thinking and encourages explanations.

About the Site **Tollgate Elementary School** **Aurora, Colorado**

Demographics


- » 45% Hispanic
- » 31% Black
- » 18% White
- » 5% Asian/Pacific Islander
- » 2% American Indian/Alaska Native
- » 65% Free or Reduced-Price Lunch

Tollgate Elementary School focuses on developing mathematically powerful students using the districtwide curriculum developed by Aurora Public Schools. Features of the program include the following:


- » A district mathematics coach and a school teacher leader who support classroom instruction, including collaborative lesson planning and demonstration lessons;
- » Use of models, manipulatives, and visual representations to support fractions instruction;
- » Ninety-minute blocks of math instruction, which allow for a number talk, whole-group lesson, small-group work, independent work time, and assessment; and
- » Emphasis on mathematical discourse and communication to explain reasoning.

Full Transcript



 **00:05** I am Cindy Matthews. I am a fifth-grade classroom teacher at Tollgate Elementary in Aurora, Colorado.

Matthews (to student) Today our learning target in math is “I can add and subtract fractions using fraction equivalents and relationships.”


Matthews  **00:18** In the number talk my goals were to have them apply adding or subtracting fractions in a real-life situation. We have worked on

adding fractions around the clock, we have talked about the nuts and bolts of how you do that with models, but now they really need to be able to put those into authentic situations so they would be able to be flexible with them.

Matthews Lizzie, would you read it for me, please?

(to student)

Student The Dumb Friends League is doing their best to help place homeless dogs during the cold weather.

Matthews  00:51 We spend a lot of time making sure kids think that as we approach a problem there are many, many ways to do that. One way I do that during the number talk, I ask the kids to give me a thumbs-up when they have an access point, when they have a place that they know they can get started.

If you have a place to start, will you give me a thumbs-up, please?
Cray, where are you going to start?

Student I am going to start by changing the numbers.

Matthews To what?

Student Into twelfths.


Matthews What model do we have up in the room that will help you change into twelfths?


Students The clock.

Matthews All right, you ready to talk it over? Okay, huddle up and let's see if we can come up with a solution to this problem.

Student Okay, we're going to do one-third and one-third is a fourth. And then we can put, what is two-sixths? It's four. So we add four from the four and we get eight. And then the extra twelfth can go to the nine. Nine-twelfths. One, two, three, four, five, six, seven, eight, nine is going to be one and six-twelfths.


Student So one whole is 100%. And if we have a few extra sixths there, then they will get their plan for 100%, but they will get even more than that.

Matthews  **02:21** The kids are introduced to many models when we began fractions. We have fraction boards, we have flip charts, we have all kinds of things to give them a model to hang onto with fractions. One of those models is the clock. The clock is a fabulous model for the kids because it lends itself to halves, thirds, fourths, twelfths, and sixths. So as the kids get flexible using those numbers, they can move back and forth between the equivalencies. I wrote the number talk to include thirds, fourths, sixths, and twelfths, I believe, because I wanted them to have the model available to them for their thinking as we move fractions into context.

Matthews  **03:06** Is there somebody that would like to share their thinking? Mimi, would you go ahead and tell me a little bit about your thinking?

Student I changed two-sixths into four-twelfths. And one-twelfth stayed the same. And I changed three-fourths into nine-twelfths.

Matthews Is there anyone that can continue Mimi's thinking because you see where she is headed? Gina.





Student  **03:39** Well, if you add four-twelfths plus one-twelfth equals five-twelfths and then you add the nine-twelfths it would be eighteen-twelfths, which is over twelve...

Matthews What did you add to five-twelfths?

Student The nine-twelfths.

Matthews And that is how many?

Student Eighteen-twelfths. Fourteen-twelfths, I mean.


- Matthews  04:05 Now, when I look that question that the problem asks us, will this plan fill the Dumb Friends League to 100%? Who can take it one more step? Kristen.
- Student It's over 100%.
- Matthews So what does that mean for the Dumb Friends League?
- Student They can't fit all the dogs in the Dumb Friends League.
- Matthews  04:32 They can't fit them all. If Colorado Springs has 20 homeless dogs and the shelter has agreed to take three-fourths, how many dogs will be coming from Colorado Springs? Take one minute to think it over... All right, I need to know. This is real-life math. How many dogs are going to come from Colorado Springs, and how do we figure that out? Okay, Michael, tell me how many dogs you believe the Dumb Friends League is going to get from Colorado Springs.
- Student  05:01 I think 15 because . . .
- Matthews All right, so you think that they are going to get 15 dogs. Can you tell me how you know that, Michael?
- Student Because the half of 20 is ten and half of ten is five.
- Matthews One-half of 20 is what?
- Student Ten. And then half of ten is five.
- Matthews Okay, why did you take half again. Can you tell me how, why?
- Student  05:29 Because we have to have three-fourths, so we are trying to split it up four times.

Matthews So when you cut half in half, what did you get?

Student Five.

Matthews What fraction did you get?

Student Oh, one-fourth.

Matthews  05:52 Nice work. What I like about your thinking is that it is taking real situations. We had a real cold spell, and the Dumb Friends League is trying to help out. Math hits our everyday lives all the time, and the more we can take what we learn and apply it in a real way, that's what really matters. That's why we are doing it.