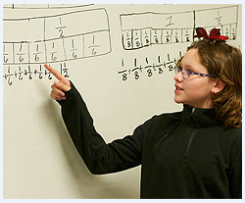
DOINGWHATWORKS

VIDEO
6:02 min

Full Details and Transcript



Ways to Measure 1 ½ Cups

Eliza Hart Spalding School of Math and Technology, Idaho
January 2011

Topic

DEVELOPING EFFECTIVE FRACTIONS INSTRUCTION FOR K-8

Practice

OPERATIONS WITH FRACTIONS

Highlights

- Fourth-grade teacher Keith Phelps leads a lesson about decomposing fractions, challenging students to identify different ways to make 1 1/2 by using different-sized measuring cups.
- Students use blocks, draw a picture, and write a number sentence.
- Mr. Phelps scaffolds students' thinking through working through the problem using twelfths.
- He explains the importance of practicing with equivalent fractions and landmark fractions as the foundation for operations with fractions.
- After working in small groups, students explain their solutions using sixths and fifths, requiring the conversion of one-fifth to tenths to figure out one-half of one-fifth.

About the Site

Eliza Hart Spalding School of Math and Technology Boise, Idaho

Demographics

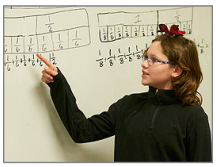
- 85% White

- 8% Native American
- 6% Black
- 5% Hispanic
- 3% Asian
- 2% Other
- 18% Free or Reduced-Price Lunch
- 1% English Language Learners
- 6% Special Education

At Eliza Hart Spalding School of Math and Technology, a math and technology magnet, the focus is on developing students' mathematical thinking. Features of the program include the following:

- A learning environment that supports using a variety of strategies in mathematical problem solving, reasoning and proof, and connections;
- Use of models, manipulatives, and visual representations to support fractions instruction; and
- Emphasis on mathematical discourse and communication to explain reasoning.

Full Transcript



00:05 I'm Keith Phelps. I teach fourth grade at Spalding Elementary School of Math and Technology in Meridian School District in Boise, Idaho.

00:12 Today we did a lesson on decomposing fractions. We started with one and a half and we're looking at different ways to make one and a half. I really try to think about the numbers I'm going to use beforehand. I like to try the problems out myself before I do them to make sure it's a good fit. One and a half seemed like a good number to use today because there's so many different ways that you can come up with one and a half, especially using the pieces that we had. It led to some great discussion about wholes and halves that we're going to come back to later.

Phelps (to students) 00:46 My son's birthday's coming up, Henry, and I want to make him a birthday cake but I have a little problem. The recipe for the birthday cake calls for one and a half cups of flour. Well, I lost my one cup and my half a cup. So fortunately, I have lots of different kinds of measuring cups. So I need your help today to figure out different ways that I can still measure out one and a half cups of flour so I can make this cake for my son.

01:18 These bars are going to represent my measuring cups. I have a fourth cup and I have a third cup. I have a sixth cup, a fifth cup. I have twelfths. Really some odd sizes; you usually can't find these in a store. An eighth of a cup and I have tenths. Think for a second, what are some different ways you can come up with one and a half cups.

01:41 So go ahead and just talk amongst yourselves. Can you think of any ways right off the top of your heads?

Let's hear what some of your ideas were. Kayden?

Kayden You could do some twelfths.

Phelps Some twelfths.

Kayden Or any one.

Phelps Okay. All right, so do you know how many twelfths I would need?

Kayden Maybe about six.

Phelps About six twelfths.

Kayden Maybe a little more.

Phelps 02:03 Maybe a little bit more. Okay. Hannah, what do you think?

Hannah You need twelve and six cups and six more. You need twelve plus six.

Phelps Twelve plus six. And why is that, Hannah?

Hannah Because there will be twelve in one whole and six to make the half.

Phelps Oh, okay. Does that sound reasonably, Kayden?

Kayden Uh-uh.

Phelps 02:25 Okay. So if I drew a picture here. So if I'm going to use twelfths, Hannah said I need twelve twelfths to make the whole, the one cup. Let's see if I can divide this up into twelfths. That's going to be a lot of scoops using my twelfths. That's my smallest one. I'm going to have to do a lot of scoops there. Okay and then how many, class, all together, how many did I need here?

Students Six.

Phelps 02:51 Six, okay. I'm going to have you use the blocks, and I want you to come up with different ways, this is just one way, I want you to build it with the blocks. After you've built it, then I would like you to draw a picture of it like I've done, drawn a picture here, and then I want you to do a number sentence for this. So you're going to build it. After you build it, what are we going to do, everybody?

Students Draw.

Phelps Draw it. And then the last step is?

Students Write a sentence.

Phelps The number sentence.

Phelps **03:21** It's important for students to be able to decompose fractions, be able to see equivalent fractions, landmark fractions, halves and wholes are key. Just building that foundation is really important later on for addition, subtraction, operations with fractions.

03:41 I try to use a lot of different representations; a lot of different manipulatives, even bringing in real-life examples of fractions like measuring cups. For this particular lesson it worked better to use the premade fraction pieces.

Phelps (to students) **03:53** I had a few people come up and draw their pictures up on the board, so I want to take a second and have you come up and explain your pictures to us and see what you found out, okay?

This first one was Hailey. Hailey, will you come up and explain what you have here and what you found out.

Hailey **04:11** I knew that about six sixths would equal one whole and three sixths will equal a half. So I did about nine sixths to make one and a half cups.

Phelps So I'd to have to use a sixth cup nine times to get one and a half cups. Let's see what happens when we use fifths.

Student **04:36** So it does work with five because five-fifths equal a whole except for you need to know what half of five is, but since it's odd you have to have a two and a half. But there's no two and a half, so you can't do it.

Phelps So for the whole it works.

Student Mm-hmm.

Phelps But for the half, fifths don't work.

Student Yeah.

Phelps So I would use five-fifths for the whole and then somewhere between—you weren't sure if it was two-fifths or three-fifths that would go here.

Student Yeah.

Phelps 05:08 All right. Does anybody know what it would be? Jayden?

Jayden You would have five-fifths to make a whole and then you would have two more fifths 'cause three-fifths won't go into half 'cause that's more than half of five. And then you'd have to have a half of a fifth, and then you'd have to have seven and a half to make one and a half.

Phelps 05:33 Okay. Good. Does anybody know what half a fifth is? All right, which block is half a fifth everybody?

Students One-tenth.

Phelps One-tenth, okay. Cool. One-tenth, so I would need five plus two and a half. So that would be seven and a half-fifths or seven-fifths and one-tenth.

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