

What's a Close Estimate?

Students are introduced to the Ten-Minute Math activity, *Estimation and Number Sense: Closest Estimate*, in which they estimate answers to computation problems. They are considering whether 100, 800, or 1,000 is the closest estimate for 41×26 .

Damian: I think it's closer to 800.

Marisol: 40 times 20 is too high to be 100.

Teacher: How many of you thought 800 was close? (Six students raise their hands.) So, did you do 40 times 20 is 800? (Students respond that they did.) Does anyone think 1,000 is closest?

Jill: 40 times 30 is 1,200. And 26 is closer to 30 than it is to 20.

Luke: I did 40 times 20, which is already 800. Then I thought the other numbers would push it closer to 1,000.

Teacher: Did anyone have ways of doing what Luke is suggesting—using some of the other numbers to get a closer estimate?

Cheyenne: I did 40 times 26, which isn't something you can do quickly. I did 26 times 4 and then I put the 0 on the end afterward. I forgot what I got—I think it was 1,040.

Richard: I had a different way to get Cheyenne's estimate. I thought of 10×26 is 260, then I doubled it to get 520, then I doubled that and it was 1,040.

Andrew: I can get it another way. 40 times 20 is 800 and then 6 times 40 is 240. That's 1,040, and that's closer to 1,000.

Teacher: Let's look at Andrew's method for a minute. He multiplied 40×20 and 40×6 . What would he have left to do? How many more groups would you need for an exact answer, using his method?

Andrew: You have to add one more 26, because it's 41, not 40.

Teacher: What do you mean, it's 41, not 40? Can someone besides Andrew talk about this? Can someone put this in a story context? How do you know it's one more group of 26?

Ursula: It's like if you had 41 boxes with 26 oranges in each one. Andrew did 40×20 and 40×6 , so that's 40 of the boxes. Now you need 1 more box with 26 in it.

Teacher: So that makes 1,000 pretty close to your answer. Is there another landmark number that could help you here?

Sabrina: 40×25 . You could think quarters!

Teacher: Who else thought of 25s? How can you figure out 40×25 easily? Sabrina, do you want to say how you did it?

Sabrina: I know that four 25s make 100, like 4 quarters make a dollar. So there are ten 4s in 40, so that's 10 hundreds. That's a thousand.

When students estimate, they often begin by breaking the numbers apart by place value and multiplying multiples of 10. Many students estimate a problem such as 41×26 by multiplying the 2 values in the 10s place, 40×20 . This approach is a good starting point for many students. This teacher asks her students to consider how to improve their estimates by looking at other parts of the problem or looking for other number relationships in the problem that yield a closer estimate, such as 40×25 . In order to help them think about how close their estimates are, the teacher asks students to consider how many more groups they would need and to place this in a context so that other students can picture their thinking. By referring to boxes of oranges, students can see that when they multiply 40×20 , they have 40 boxes with 20 oranges but they still need 6 more oranges in each box, which adds on 240 more oranges (as well as one more complete box).