



Building Understanding of Division through Base-Ten Blocks and Area Models

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We looked at several models using the area model for multiplication. We looked at several problems using the area model for multiplication. The same model can be used for division. When we looked at multiplication, we thought about building a rectangle whose sides are the factors of the number. When we know both sides of the rectangle, we're trying to find the area of the rectangle, which is the product. With division, we're looking at something different. We know the area. We know one side of the rectangle. We're trying to determine the other side of the rectangle. So if we wanted to do a problem like 168 divided by 12, we would need to start with the total area. One hundred, sixty, eight, 168 total. I know that one side of my rectangle has to be what? 12. So I'm going to build this side of my rectangle as 12. So here is the length of this side now is 10, 11, 12. I can't go any farther this way, that's a given. So I need to build the rectangle out this way. And I just keep putting it together till I run out of pieces. I can keep going, and this one kind of falls into place. Sometimes it's not quite this easy, and we could talk about what happens when you get a remainder, but for our purposes right now, I started with an area of 168. I kept this side of the rectangle at 12. What is the length of this side of the rectangle? And it's 10, 11, 12, 13, 14. So 168 divided by 12 equals 14.

You can also see all the groups of 12. I could have 10 groups of 12 here, and then I have another group of 12, another group of 12, another group of 12, another group of 12. This can lend itself to an algorithmic way of looking at this. If I wanted even looking with the standard old garage, if I wanted to divide 168 by 12 rather than try to get the exact number closest to start



on, I can just use what I know about 12, and start anywhere. Let's start with 10 times 12 since we've built that here. If I know 10 times 12 is 120, then I have how much left to build? I had 48 left to push over. I know that 4 times 12 is 48, so my answer is 14. What if I only knew that maybe I know five times 12 is 60? So I can do that again. Now I'm down to four times 12 is 48. I could do one times 12, 14 times. It would work. It helps students start with what they know, without fishing around forever trying to get it exactly. And they don't have to worry about moving over, and bringing down, and where are they, and where does a decimal point go, and a whole bunch of other things, if they learn to do partial quotients this way.