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Unit 5, Lesson 12

# Dividing Numbers that Result in a Decimal

Let’s find quotients that are not whole numbers.

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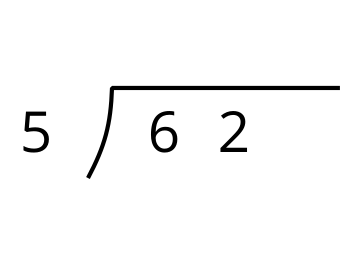
## 12.1Math Talk: Dividing by 4

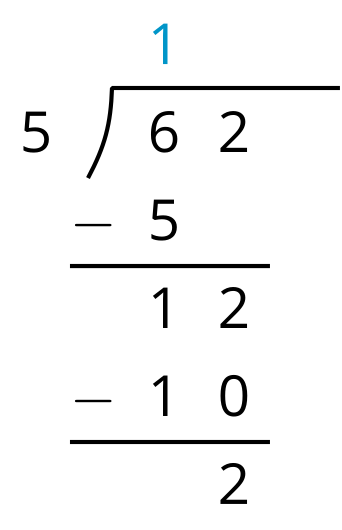
Find the value of each quotient mentally.

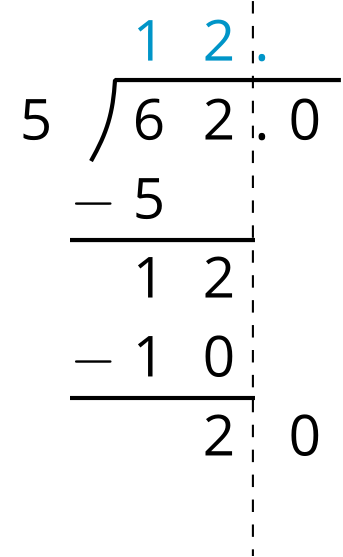
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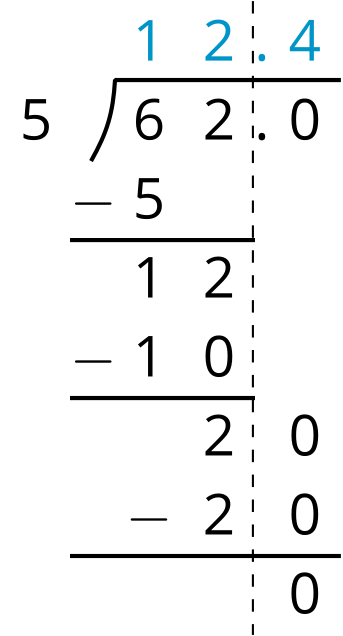
## 12.2Whole Numbers No More

Here is how Lin calculated .









1. Discuss with your partner:
   1. In the third step, Lin drew a vertical dashed line to the right of the 2 in 62. What do you think that line is for?
   2. She also wrote a point and a 0 to the right of 62. Then she put a 0 after the remainder of 2. What do you think the zeros are for?
   3. Lin subtracted 5 groups of 4 from 20. What value does the 4 in the quotient represent?
   4. What value did Lin find for ?
2. Use long division to find the value of each expression. Then pause so your teacher can review your work.
3. Use long division to show that:

* , or , is 1.25.
* , or , is 0.8.
* , or , is 0.125.

### Are you ready for more?

Noah said we cannot use long division to calculate because there will always be a remainder.

1. What do you think Noah meant by “there will always be a remainder”? Explain your reasoning.
2. What do you think is the value of ?

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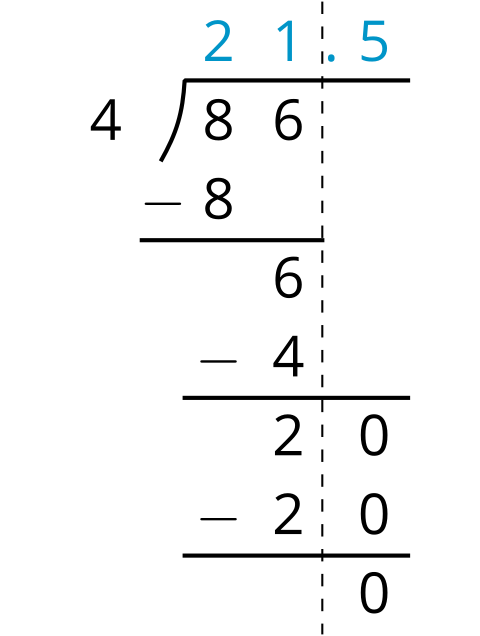
## 12.3Using Long Division to Divide Decimals

Use long division to answer each question.

1. What is the value of ?
2. Five students raised $77.40 for a charity. If everyone raised the same amount, how much money did each student raise?

## Lesson 12 Summary

We can use long division to find quotients even when the numbers involved are not whole numbers. Here is the long-division calculation of , which results in a decimal quotient.



The calculation shows that, after removing 4 groups of 21, there are 2 ones remaining. We can continue dividing by writing a 0 to the right of the 2 and thinking of that remainder as 20 tenths, which can then be divided into 4 groups.

To show that the quotient we are working with now is in the tenths place, we put a decimal point to the right of the 1 (which is in the ones place) at the top. It may also be helpful to draw a vertical line to separate the ones and the tenths.

There are 4 groups of 5 tenths in 20 tenths, so we write 5 in the tenths place at the top. The calculation likewise shows .