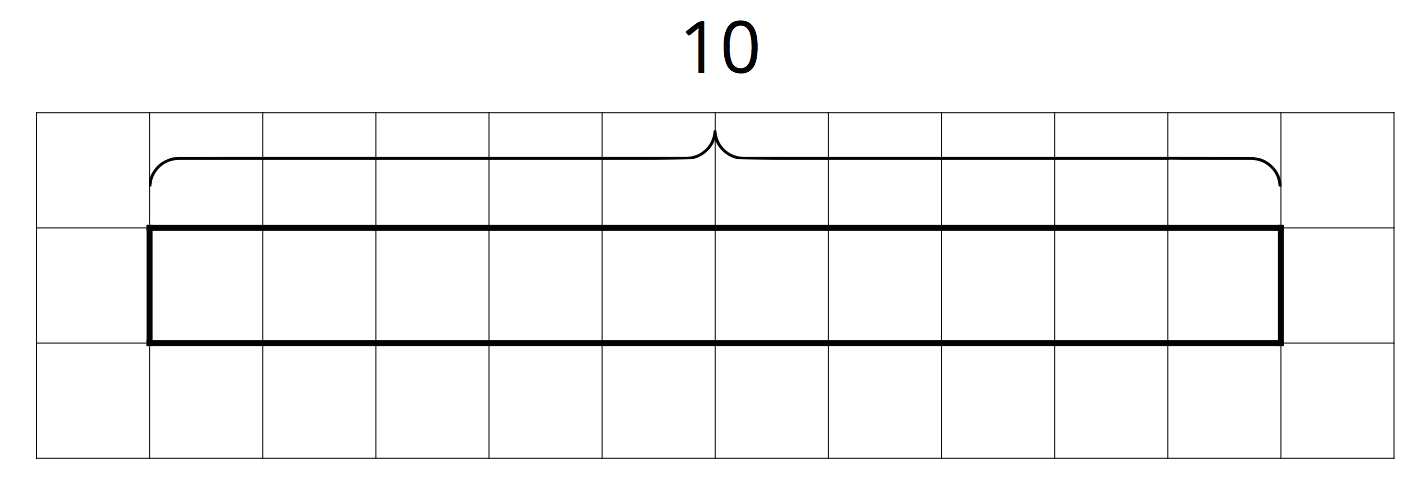
## Lesson 3: How Many Groups?

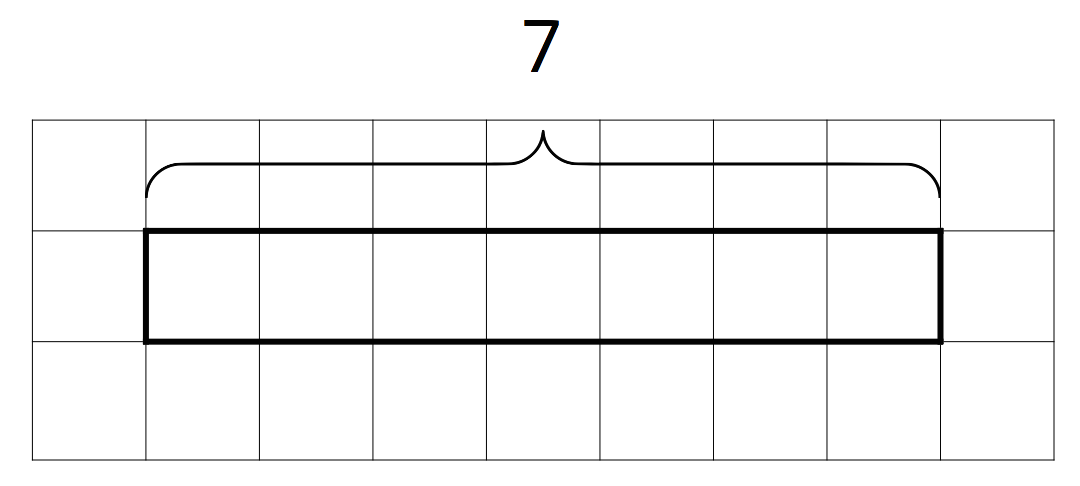
Let’s draw tape diagrams to think about division with fractions.

### 3.1: How Many of These in That?

1. We can think of the division expression as the question: “How many groups of are in 10?” Complete the tape diagram to represent this question. Then find the answer.

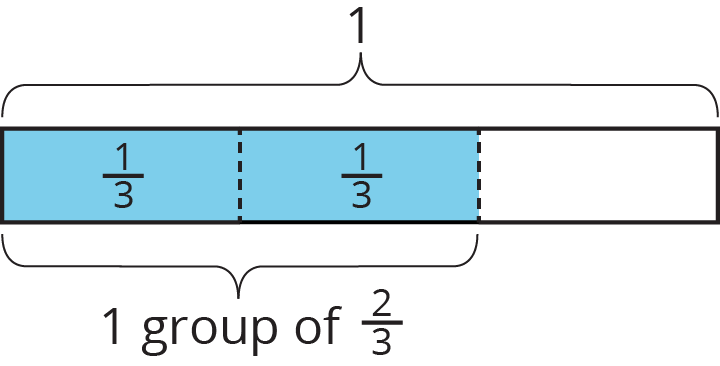
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1. Complete the tape diagram to represent the question: “How many groups of 2 are in 7?” Then find the answer.

* 

### 3.2: Representing Groups of Fractions with Tape Diagrams

To make sense of the question “How many s are in 1?,” Andre wrote equations and drew a tape diagram.



1. Andre wasn’t sure how to deal with the remainder.
   * Diego says, “The answer is , because the remainder is of the rectangle.”
   * Jada says, “I think the answer is . Since we want to find out ‘how many s there are,’ we should compare the leftover part to a group of . The remainder is of a group.”

* Do you agree with either of them? Explain or show your reasoning.

1. Write a multiplication equation and a division equation for each question. Then, draw a tape diagram and find the answer.
   1. How many s are in 1?
   * 
   1. How many s are in 3?
   * 
   1. How many s are in 5?
   * 

### 3.3: Finding Number of Groups

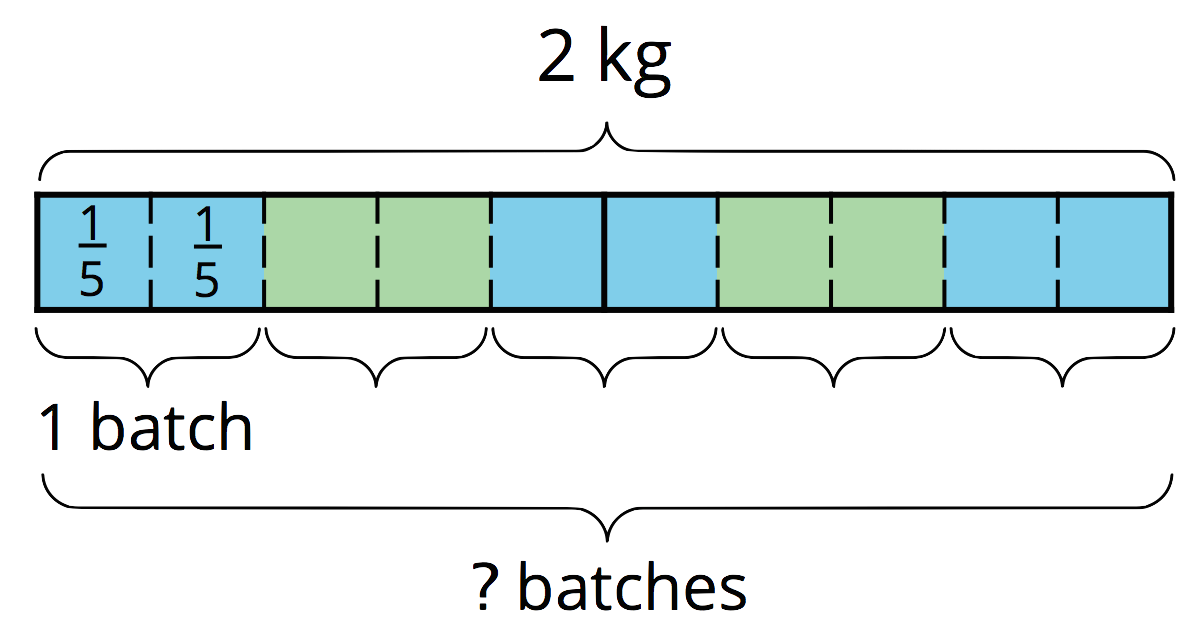
1. Write a multiplication equation or a division equation for each question. Then, find the answer and explain or show your reasoning.
   1. How many -inch thick books make a stack that is 6 inches tall?
   2. How many groups of pound are in  pounds?
2. Write a question that can be represented by the division equation . Then, find the answer and explain or show your reasoning.

### Lesson 3 Summary

A baker used 2 kilograms of flour to make several batches of a pastry recipe. The recipe called for kilogram of flour per batch. How many batches did she make?

We can think of the question as: “How many groups of kilogram make 2 kilograms?” and represent that question with the equations:

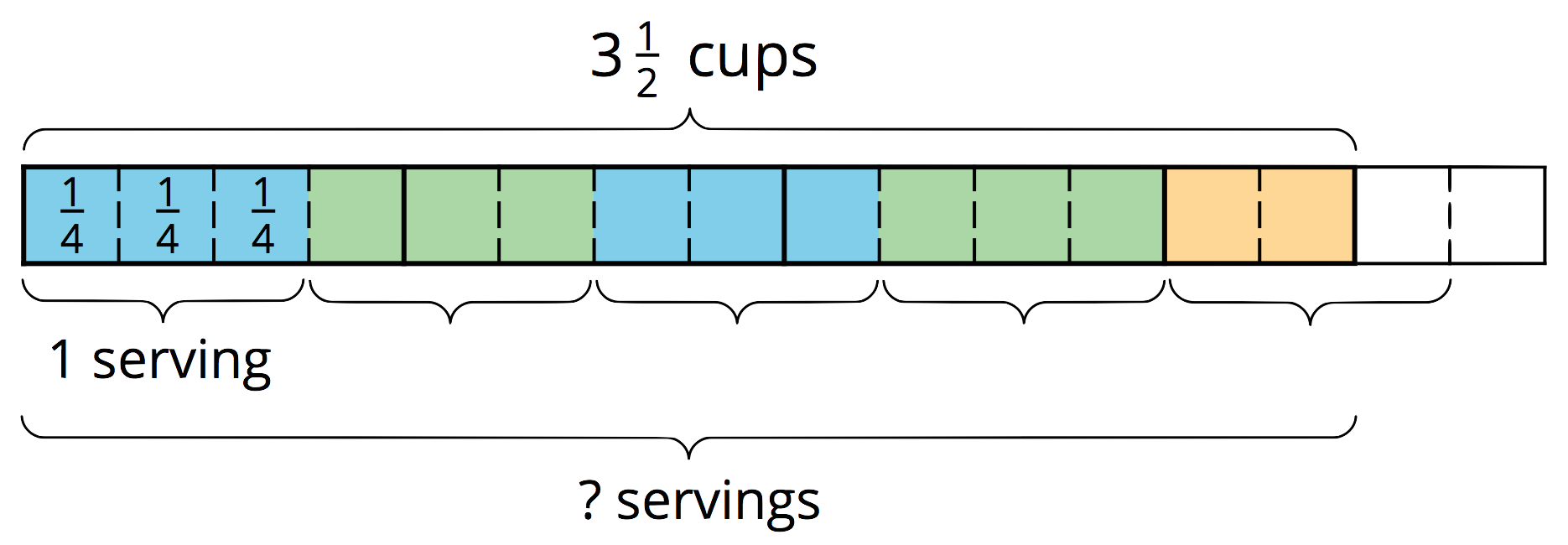
To help us make sense of the question, we can draw a tape diagram. This diagram shows 2 whole kilograms, with each kilogram partitioned into fifths.



We can see there are 5 groups of in 2. Multiplying 5 and allows us to check this answer: and , so the answer is correct.

Notice the number of groups that result from is a whole number. Sometimes the number of groups we find from dividing may not be a whole number. Here is an example:

Suppose one serving of rice is cup. How many servings are there in cups?



Looking at the diagram, we can see there are 4 full groups of , plus 2 fourths. If 3 fourths make a whole group, then 2 fourths make of a group. So the number of servings (the “?” in each equation) is . We can check this by multiplying and .

, and , which is indeed equivalent to .



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