

[Illustrative Mathematics](#)

3.NF Naming the whole for a fraction

[Alignment 1: 3.NF.A.1](#)

Mrs. Frances drew a picture on the board.



Then she asked her students what fraction it represents.

- Emily said that the picture represents $\frac{2}{6}$. Label the picture to show how Emily's answer can be correct.
- Raj said that the picture represents $\frac{2}{3}$. Label the picture to show how Raj's answer can be correct.
- Alejandra said that the picture represents 2. Label the picture to show how Alejandra's answer can be correct.

Commentary:

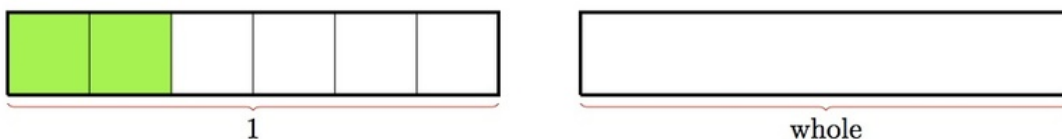
Fractions are always fractions of some whole. It is sometimes easy to forget to indicate this in a picture, particularly because the idea may be clear in our own mind. The goal of this task is to show that when the whole is not specified, the fraction is left ambiguous. The teacher may wish to simply draw this picture on the board and have students think about what fraction the picture represents and follow this up with a discussion. When the whole is not specified for a fraction, a picture can represent an infinite number of different fractions: in this case there could be any number of small boxes (1, 2, 3, ...) in a whole and each possibility leads to a different meaning for the shaded part of the picture.

This task gives students a chance to engage in Standard for Mathematical Practice 6, Attend to Precision. Most people are familiar with the aspects of MP 6 that relate to numerical precision, but attending to precision is more aptly considered a general mindset where one takes care to describe things carefully and clarify ambiguity. Having students recognize that a picture can be ambiguous, and giving them tools to clarify their thinking, is an important aspect of having students engage in MP 6.

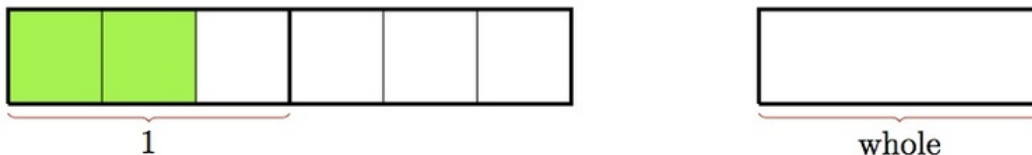
In addition to teaching students that it is important to label the whole whenever dealing with a fraction, this task also gives the students a chance to exercise creativity as they improve their general understanding of fractions.

Solution: 1

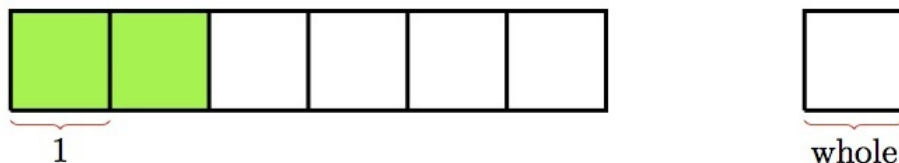
- Emily's answer of $\frac{2}{6}$ would mean that all six little boxes are the whole and two of these have been shaded:



- For Raj, there are 3 small boxes in the whole so the two shaded boxes represent two out of three or $\frac{2}{3}$:



- For Alejandra, each little box is one and so the whole is one little box as pictured below:



Note that in addition to specifying the whole in the picture, each whole has been outlined with thicker lines: this is a second way of indicating and reinforcing the meaning of the whole in the picture. Also, the whole itself is not a number (hence it is labelled "whole"): the pictures, on the other hand, all represent numbers, namely fractions of the given whole.

