Fractional Parts of a Number
Another Approach

Many adults would solve the three problems from the video using a mathematical procedure similar to those displayed below.

Problem 1: ***Two fifths of Rocco's morning class will perform at a recital. If 20 students are in the morning class, how many will perform at the recital?***

Thinking: I need to find two fifths of 20. The word *of* tells me to multiply.

$$\frac{2}{5} \text{ X } 20 = \frac{2}{5} \text{ X } \frac{20}{1}$$

Cancel the 5 and the 20. Multiply the numerators and the denominators.

$$\frac{2}{\cancel{5}_{1}} \text{ X } \frac{\cancel{20}^{4}}{1} = \frac{8}{1} \text{ or } 8$$

Problem 2: ***Twelve students from Rocco's evening class signed up to be at the recital. That is two thirds of the class. How many students are in the evening class?***

Thinking: If two thirds of the students in the class equals 12, then 12 ÷ 2/3 equals the number of students in the class. To find 12 ÷ 2/3, multiply by the reciprocal of 2/3 which is 3/2.

$$12 \div \frac{2}{3} = \frac{12}{1} \text{ X } \frac{3}{2}$$

Cancel the 12 and the 2. Multiply the numerators and the denominators.

$$\frac{\cancel{12}^{6}}{1} \text{ X } \frac{3}{\cancel{2}_{1}} = 18$$

Problem 3*: There are 24 students in Rocco's drum class, but only six students can make the recital. What fraction of students in the drum class can make the recital?*

Thinking: Six out of 24 is 6/24. Simplify the fraction by dividing both the numerator and denominator by six.

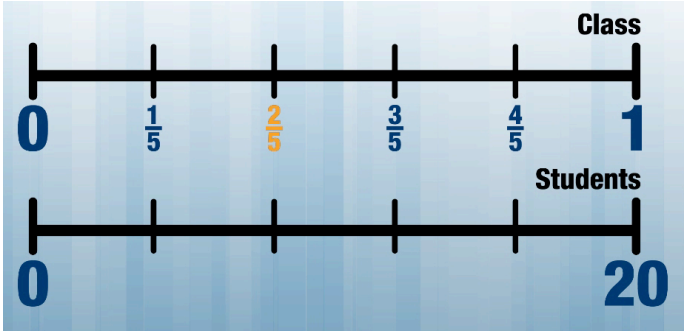
$$\frac{6}{24} = \frac{1}{4}$$

To solve the problems using the methods described, you must determine which procedure to use (multiply by a fraction, divide by a fraction, simplify a fraction) and then carry out the procedure. Students often have difficulty with this type of problem because they are not sure

what procedure to use. Similarly, they often have difficulty recognizing if their answer makes sense.

The double number line helps you represent a problem by showing the relationships among the numbers. This representation helps you understand how to solve the problem and easily determine if your solution makes sense. Consider problem 1 from the video.

Problem 1: ***Two fifths of Rocco's morning class will perform at a recital. If 20 students are in the morning class, how many will perform at the recital?***



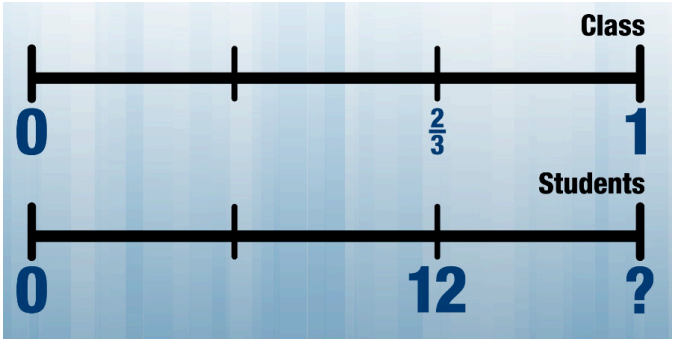
The double number line helps you understand that the class is equal to 20 students and is divided into fifths. It also helps you realize that a reasonable answer is less than half of twenty. You can determine that one fifth of 20 is four, so two fifths of 20 must be eight. This reasoning and diagram helps make sense of the multiplication procedure.

Twenty divided by five equals four. $\frac{2}{\cancel{5}_{1}} \times \frac{\overset{4}{\cancel{20}}}{1} =$

Two times four equals eight. $\frac{2}{\cancel{5}_{1}} \times \frac{\overset{4}{\cancel{20}}}{1} = \frac{8}{1}$ or 8

The second video problem involves division of fractions rather than multiplication of fractions. The double number line helps you represent and solve the problem with understanding.

Problem 2: ***Twelve students from Rocco's evening class signed up to be at the recital. That is two thirds of the class. How many students are in the evening class?***



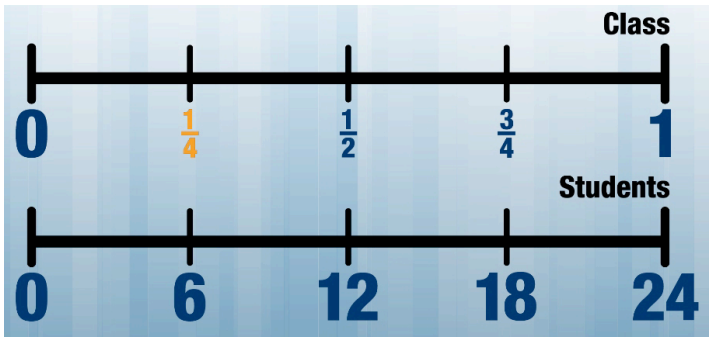
The double number line shows that two thirds of the class is 12 students and helps you see that the whole class must be greater than 12 students. It also helps you see that half of two thirds is one third and half of 12 is six. If you know one third is six and the entire class is three thirds or one, it makes sense to multiply six by three to find the number of students in the entire class. This reasoning and diagram help you understand why the procedure works.

Twelve divided by two equals six. $\frac{\cancel{12}^{6}}{1} \times \frac{3}{\cancel{2}_{1}} =$

Six times three equals 18. $\frac{\cancel{12}^{6}}{1} \times \frac{3}{\cancel{2}_{1}} = 18$

The third problem from the video is different from problems 1 and 2. The double number line is still a good way to represent and solve the problem.

Problem 3: ***There are 24 students in Rocco's drum class, but only six students can make the recital. What fraction of students in the drum class can make the recital?***



The double number line shows the relationship between 6 and 24. Twenty four divided by six equals four. This means you can divide the entire class into fourths, with one fourth representing six students.

$$\frac{6}{24} = \frac{1}{4}$$

The double number line is a great way to represent the relationship between the numbers in a problem. You can solve the problem with a number sense approach using the double number line or by using a mathematical procedure. Even if you use the mathematical procedure, the double number line helps you recognize if your solution makes sense.