6.RP Sweet Tea

Alignments to Content Standards: 6.RP.A

Task

a. If you have a cup of tea, will it be sweeter if you add one teaspoon of sugar or two?

b. If you have two identical cups of tea and add one teaspoon of sugar to each, they will taste the same.
   i. If you pour both cups into a larger container and mixed them thoroughly, will the result taste the same or different?

   ii. How many cups of tea are in the mixture? How many teaspoons of sugar are in the mixture?

   iii. If you mix two cups of tea with two teaspoons of sugar, will it taste the same or different as one cup of tea with one teaspoon of sugar?

c. A small pitcher contains 4 cups of tea and 2 teaspoons of sugar. A large pitcher contains 6 cups of tea and 4 teaspoons of sugar. Will the tea in the large pitcher be more, less, or have the same sweetness as the tea in the small pitcher? Explain and draw a picture to illustrate.

IM Commentary

The purpose of this task is to help students understand why equivalent ratios of food ingredients result in mixtures that taste the same even if the individual quantities are different, and to use this understanding to determine whether two different mixtures will taste the same or not. The key move in reasoning is to compare ratios where one
quantity is the same to see whether the other quantity is the same or different.

Parts (a) and (b) might seem trivial to an adult, but this task was written because the conclusions might not be obvious to students with no experience with mixture tasks. The hope is that asking these explicit questions will make it more likely that students will find success working with equivalent mixtures in future work.

Students should have seen and used diagrams to represent ratios before this task. Ideally, they will have drawn either discrete or tape diagrams, and can use one of these to represent their thinking for part (c). Part (c) may result in many different, interesting student responses that a teacher could use to assess where students are in their understanding.

Edit this solution

Solution

a. A cup of tea would be sweeter with two teaspoons of sugar added than it would be with only one teaspoon of sugar added.

b. No response necessary.
   i. Because they tasted the same to start, mixing them together will result in tea that will taste the same as each cup tasted separately.

   ii. There are two cups of tea and two teaspoons of sugar in the mixture.

   iii. Two cups of tea with two teaspoons of sugar will taste the same as one cup of tea with one teaspoon of sugar.

c. The tea in the large pitcher will be sweeter than the tea in the small pitcher.

There are many ways to draw diagrams of this situation, and many ways to reason about any given diagram. The key is to compare some like quantity between the two pitchers. In this example, we compare the amount of sugar in 2 cups of tea for each pitcher.

In the small pitcher (the top diagram), you can see in the diagram that for every 2 cups of tea, there is 1 teaspoon of sugar. But in the large pitcher (the bottom diagram), you can see that for every 2 cups of tea, there is more than 1 teaspoon of sugar.