Understanding Fractions
Check Your Understanding

One indicator of how well a student understands fractions is to compare a student's work and explanation for a problem with how other students have responded to the same problem. Students, parents, or teachers can use the following problem and sample responses to evaluate understanding.

Directions for the Student:

1) Solve the following problem and explain your work and answer.
2) Compare your work to the sample responses in order to determine if your work indicates deep, partial, or beginning understanding.

Problem:

Weston was supposed to cut off $\frac{3}{4}$ of the length of a piece of string that he had. How should he do that?

Level of Understanding	Sample Student Response	Comments
Deep Understanding	**Student 1:** "He could just lay out the string, then put the two ends together. That length would be half of the string. Then double it again so there are 4 parts. Now he can cut so there are 3 parts and 1 part."	This student clearly understands that $\frac{3}{4}$ means to split the string into four equal parts, then cut off three of the four parts.
	Student 2: "I thought he should measure the piece and divide it by four. Then cut off $\frac{1}{4}$ of it. The string was one whole and if you divide it by four, you get fourths. Cut off one fourth and you have $\frac{3}{4}$ left." 	This student understands that Weston needs to make four equal parts. Instead of folding, this student measured. The student also knows that $\frac{1}{4}$ and $\frac{3}{4}$ make the whole.

Level of Understanding	Sample Student Response	Comments
Partial Understanding	**Student 3:** "Three fourths is halfway between $\frac{1}{2}$ and 1, so lay the string out and guess about where that is."	This student has the right idea, but guessing is not needed if the string is folded into equal parts.
	Student 4: "Mark four lines that each stand for one inch. Then cut the leftover string on the ends. Finally, cut the line to the left." 	This student understands that Weston needs three out of four equal parts. He does not understand that Weston wants $\frac{3}{4}$ of the whole string, not $\frac{3}{4}$ of a 4-inch string.

Level of Understanding	Sample Student Response	Comments
Beginning Understanding	**Student 5:** "Three is close to four, so that's about all of the string."	Some students believe that if the numerator is close to the same size as the denominator, the fraction is close to one. They do not think about the number equal parts or the size of each part.
	Student 6: "Cut off 75 centimeters."	This student does not seem to understand that you must consider the length of the original string, which is the whole, or 1. If the string were 1 meter (100 centimeters) long, this student would be correct.