Comparing Decimals
Check Your Understanding

One indicator of how well a student understands comparing decimals 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:

Mrs. Olson was buying a roast at the meat market. She had two of them weighed. One was 3.6 pounds. The other was 3.17 pounds. Which one weighed more?

Level of Understanding	Sample Student Response	Comments
Deep Understanding	**Student 1:** "Six tenths is more than one tenth, so three and six tenths is greater than three and one tenth and greater than three and seventeen hundredths." 3.6 > 3.17	This student is comparing corresponding digits from the left. The first digit, which is in the ones place, is the same in both numbers. The tenths digit is greater in 3.6, so it is greater.
	Student 2: "Six tenths is the same as 60 hundredths. Three and 60 hundredths is more than three and 17 hundredths, so 3.6 is more." 3.60 > 3.17	By changing 3.6 to 3.60, an equivalent amount, this student is able to easily compare 3.60 and 3.17 because they both have the same number of decimal places."

Level of Understanding	Sample Student Response	Comments
Partial Understanding	**Student 3:** "Three point six is more than three and a half, but three point seventeen has more decimal places. I think 3.17 is bigger."	Students who read decimals three point six, instead of three and six tenths, often do not understand decimal place values. This student realizes that 3.6 is more than 3.5, good number sense, but doesn't trust that knowledge enough to override the knowledge that whole numbers with more decimal places are greater. Decimals with more places are not necessarily greater.
	Student 4: "Three point six would be like $3 and 6 dimes, but it's got to be smaller because it doesn't have as many decimal places."	Relating one- and two-place decimals to money can sometimes help, but the knowledge that a whole number with fewer places is less is more compelling. Decimals with more places are not necessarily greater.

Level of Understanding	Sample Student Response	Comments
Beginning Understanding	**Student 5:** "Three point six is bigger because three point one seven has more places and that makes it smaller."	This student got the correct answer for the wrong reason. Some students think that a number with more decimal places is small because the digits to the right represent small amounts. They don't realize that the other digits might represent larger numbers.
	Student 6: "Three point one seven has more decimal places, so it's bigger."	This student believes that a number with more decimal places is greater than one with fewer decimal places. That is true for whole numbers, but not necessarily for decimals.