## Components of Number Sense: Part I

Noelle Palasty, Math Accessibility Specialist, Alt+Shift
Noelle.palasty@altshirt.education

When developing math lessons, it is important to have an understanding of the components of number sense. The seven components are the backbone needed for students to be able to "do math."

This particular Components of Number Sense wheel was developed by Cain, Doggett, Faulkner and Hale. The circular image implies that no one component is more valuable than the others. They are interrelated and are the foundation for mathematical reasoning to occur. We will explore three of the components in this edition with the additional components to be highlighted in future editions.

Components of Number Sense
© 2007 Cain/Doggett/Faulkner/Hale/NCDPI
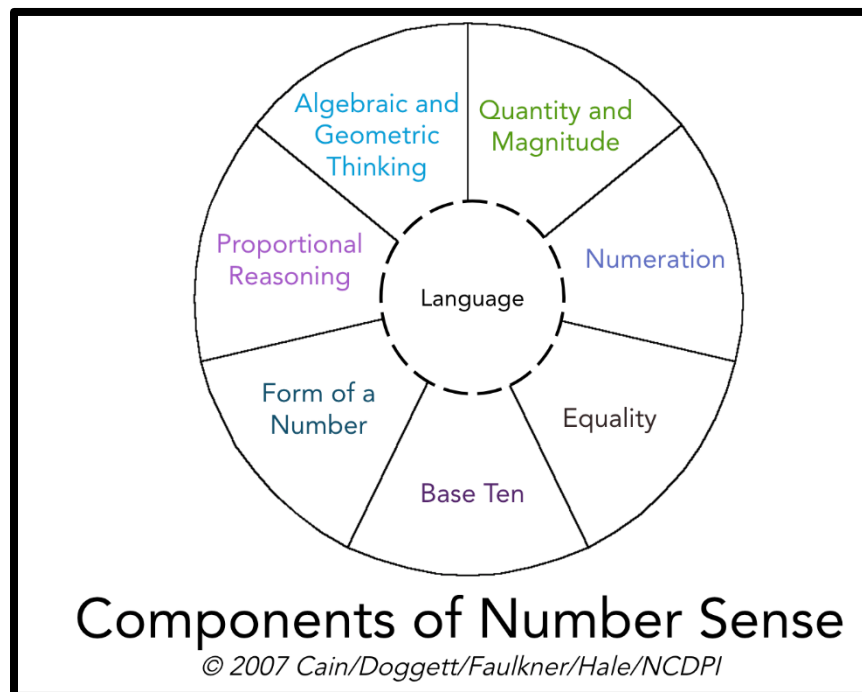
Quantity and Magnitude: Quantity is the amount of something while magnitude is the relative size or amount as compared to something else. Consider getting 4 M&Ms when you are craving chocolate. That may not seem like a lot, however, imagine 4 bats flying around in your bedroom. That will likely feel like a lot! For older students, do they know that $3x$ means they have 3 sets of whatever x represents?

Numeration: Numeration is the reading, writing and naming of numbers. This is closely related to the principles of counting and includes 1-1 correspondence, stable order, cardinality, abstraction and order irrelevance. As students get older, the types of numbers may get more difficult to write and name, such as decimals, fractions, and irrational numbers. Being able to read, write, and name those numbers is as important as whole numbers.

Equality: The equal sign is often defined as "the same as", however, this isn't quite accurate. For example:
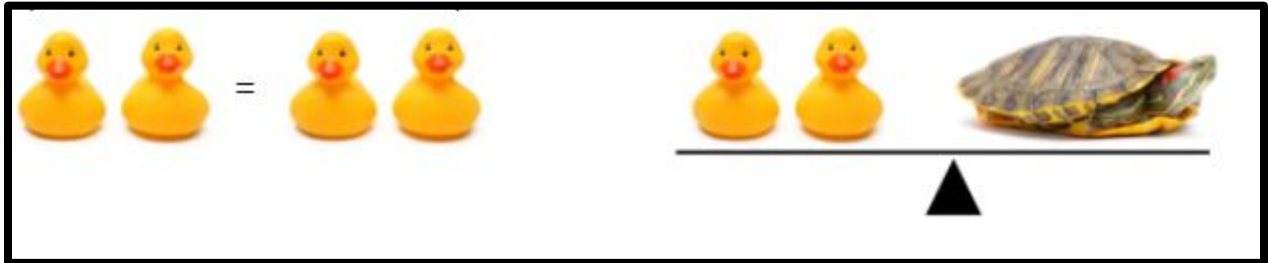
2 ducks are the same as 2 ducks, but are 2 ducks the same as 1 turtle? What misconceptions might a student with language deficits experience as a result of this definition? Adjusting our definition to include a unit, such as "*the same amount as*" or "*the same weight as*", will increase the likelihood of students developing a more secure understanding of its meaning. This will help when students encounter an equation such as $x^2 + x - 11 = 2x + 5$. What does the equal sign mean here?

As you prepare your instruction, consider including opportunities for students to explore relationships between numbers, see patterns and have fun!