They go along through number and operations, they learn geometry, and then when they get to algebra, it is if they have to climb this cliff. We tried to write the standards so that there's a ramp up to the top of that cliff. We started all the way back in kindergarten thinking about what it is that kids are doing with number that prepares them for algebra. And that's why we made this choice to separate out what is traditionally just being a number and operation strand into two domains. Operations and algebraic thinking, which is where kids learn about how operations work.

For example, that's where they learn that subtraction is really the solution to a missing addend problem, so there's that relationship between addition and subtraction. Later on they learn that there's a similar relationship between multiplication and division. That domain is the one that's leading them up to expressions and equations in middle school. At the same time, there is this number and operations in base ten domain which is where they are learning to compute and do addition and subtraction. As distinct from understanding the operation itself, they are learning how to do the calculation that's important to build number sense and to build facility [fluency]. That's the one that leads into this number system domain in middle school.

Fractions coming in a very important way in third grade. Fractions are another aspect of this ramp up to algebra, because if you think about it when kids start working with fractions they are almost doing algebra with numbers, really.

They see a fraction 3 over 4 and they have to add it to four-fifths. It's almost as if they're adding A over B to C over D. They see those operations starting to play out with how they work with numbers as a rehearsal for doing it later when they get to algebra.

Source:
https://www.youtube.com/watch?v=ONPAdo_Nt14&list=PLD7F4C7DE7CB3D2E6

Listings of all videos in the series:
http://www.cesso.org/Resources/Digital_Resources/Common_Core_Implementation_Video_Series.html
https://sites.google.com/site/commoncoreinvermont/home/hunt-institute-video/hunt-videos-math