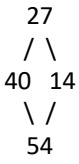
About the Mathematics: Informal Notation – Doubling, Tripling…

Alternative informal representation of student thinking
For doubling, tripling… numbers

With the warm-up work around doubling, tripling, etc. numbers, the goal is not to have students worry about how the mathematics should formally look. Rather, the intent is to merely have students respond to the number sense. Formal representation will come later.

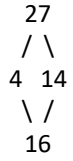
The *"Branching Recording Method"*

- Place the number to be double, tripled, etc. on the board just by itself
- As the student responds as to what they calculated first, draw a "branch below to indicate the quantity
- Example: *Double 27*



- Listen for students who only start with the one's place. Pose the question, would you get the same answer if you started with the 20? If they are not sure, try it again but doubling the 20 first.
- If the student says, yes, then pose the question, were you closer to your final answer if you started with the larger first or when you started with the lower part of the number? This is to stimulate a conversation around the strategic benefit of starting with the larger. For example, if I were to quadruple 54, and I start with the larger, I know my answer will be above 200. Whereas, if I start with the smaller part of the number, I would know my answer is above 16. While true, 200 provides a more reasonable estimate of the final total than does the 16.

- *The Importance of Language*
  - It is imperative that students *"watch their language"* while engaging in this exercise. If, however, a student talks in single-digit language, I will record their responses literally as follows.



I would then ask the student, *so if I double 27 I get 16? Does that make sense? Let's do that again and this time I want you to 'watch your language.' I understand that 7 + 7 is the same as 14. But how much of the number is this?* [Pointing to the 20.] *Oh, it's 20. Double 20 for me.* [40]. *So, 40…*

- *Alternative Decomposition of Number*
  - Decomposing a number such as 27 may result in an alternative decomposition of the number. There is no rule that 27 must be broken into 20 + 7. It could just as readily be decomposed into 25 + 2.