4.OA Comparing Growth, Variation 1

Leo has two snakes, Jewel and Clyde. Jewel was six feet and Clyde was eight feet. A year later Jewel was eight feet and Clyde was 10 feet. Which one grew more?

Commentary:
The purpose of this task is to foster a classroom discussion that will highlight the difference between multiplicative and additive reasoning. Some students will argue that they grew the same amount (an example of "additive thinking"). Students who are studying multiplicative comparison problems might argue that Jewel grew more since it grew more with respect to its original length (an example of "multiplicative thinking"). This would set the stage for a comparison of the two perspectives. In the case were the students don't bring up both arguments, the teacher can introduce the missing perspective.

In later grades, students will learn that "which grows more" means "which has the greater absolute increase?" and "which has the greater growth rate?" means "which has the greater increase relative to the starting amount?" but students won't see this type of language for two or three years. Teachers need to be aware of this and work to ask questions as unambiguously as possible; for example, when asking for multiplicative comparisons, use language such as, "How many times greater is x than y." They should also be prepared to address this potential for confusion along the way.

Solution: 1

Viewing this additively, both snakes grew 2 feet and therefore grew the same amount. Viewing it multiplicatively, Jewel grew $\frac{2}{6}$ its length, while Clyde grew $\frac{2}{8}$ its length. From this perspective, Jewel grew more. Given the purposeful phrasing of the problem, both interpretations are reasonable, but the goal is to understand the two perspectives, thus the difference between additive and multiplicative reasoning.

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