

# 7.NS, 8.NS Repeating or Terminating?

## Task

Tiffany said,

*I know that 3 thirds equals 1 so  $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$ .*



*I also know that  $\frac{1}{3} = 0.333 \dots$  where the 3's go on forever. But if I add them up as decimals, I get 0.999 ....*

$$\begin{array}{r} 0.333 \dots \\ 0.333 \dots \\ +0.333 \dots \\ \hline 0.999 \dots \end{array}$$

*I just added up the tenths, then the hundredths, then the thousands, and so on. What went wrong?*

a. Write  $0.999 \dots$  in the form of a fraction  $\frac{a}{b}$  where  $a$  and  $b$  are whole numbers. Are Tiffany's calculations consistent with what you find? Explain.

b. Use Tiffany's idea of adding decimals to write  $\frac{1}{3} + \frac{1}{6}$  as a repeating decimal. Can this

also be written as a terminating decimal?



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