**FRACTIONS**

Subject: *Breaking Apart Fractions* Grade: *4*

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| Common Core State Standards |
| **4.NF.3b:** Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples:* $\frac{3}{8}=\frac{1}{8}+\frac{1}{8}+\frac{1}{8}$*;* $\frac{3}{8}=\frac{1}{8}+\frac{2}{8}$*;* $2\frac{1}{8}=1+1+\frac{1}{8}=\frac{8}{8}+\frac{8}{8}+\frac{1}{8}$*.* |
| Objectives |
| Learn to decompose (or break down) a given fraction into sequences of fractions that add up to itself, and to write out the sum of fractions in different ways.  |
| Launch Questions |
| **Q.** How does decomposing (or breaking down) fractions help one learn to add fractions?**Q.** What kind of fraction cannot be broken down? |
| Definition/Properties To Know |
| **Decompose (a fraction):** Breaking a fraction into smaller parts (fractions) that can be added together and equal a value similar to that of the fraction before its decomposition. |

*Warm-Up Activity:* See “WU 5”

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| Lesson (Introduction to Problem) |
| Every summer, you and 3 friends prepare lemonade because it is hot outside and you all want to go out and play. This summer, you guys decided to follow your grandmother’s secret lemonade recipe which requires 36 fluid ounces of water. Because today was a particularly hot day, you each prepare your own batch of lemonade. After preparing the lemonades, you open your cupboard to find out that all your cups are not exactly equal in size. You gave: yourself an 8 fl oz (fluid ounce) cup; Henry a 9 fl oz cup; Hiro a 12 fl oz cup; and Hector a small 4 fl oz cup. **Q.** For each person, write a sequence of fractions whose sum equals the total number of cups needed to finish the batch of lemonade. Write the sequences in a variety of way; *do not limit to unit fractions*.**Q.** Who filled up their cups the most to finish the 36 fl oz batch of lemonade?* Students should first start with unit fractions, and then should progress to using different proper fractions. Students have the liberty to design their sequences in a variety of ways.

*Ex. (Henry):* $\frac{9}{9}+\frac{18}{9}+\frac{9}{9}=\frac{18}{9}+\frac{18}{9}=\frac{36}{9}$*.* * For the second problem, it is important that students think about the meaning of division and its relation to fraction. They should see the fraction $\frac{a}{b}$ as $a÷b$for it will help them solve this problem. The total number of cups corresponds to the number of times *x* fl oz (or $\frac{x}{x}$) fits into 32 fl oz (or $\frac{32}{x}$).

*Ex. A cup of 5 fl oz can be filled 4 times to finish 20 fl oz of water.* $\frac{20}{5}=4$ |
| Materials (If Needed) |
| * Paper and Pencil
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*Main Project:* See “MP 5”

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| Closure/Expectations |
| Students will learn to decompose a fraction into various sequences in order to show that there are different ways to express the sum of two or more fractions. By learning how to add *x* numbers of unit fractions, students will be able to tackle on the topic of *Multiplication* with Fractions*.*  |