**FRACTIONS**

Subject: *Finding Equivalent Fractions*  Grade: *4*

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| Common Core State Standards |
| **4.NF.1:** Explain why a fraction$\frac{a}{b}$is equivalent to a fraction$\frac{n⋅a}{n⋅b}$by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. |
| Objectives |
| Learn to recognize and generate equivalent fractions, and to simplify a fraction by factoring the greatest common factor that both the numerator and the denominator share. Students should also understand that there are infinite equivalent fractions for a given fraction. If possible, introduce students to the benefits of Cross Multiplication. |
| Launch Questions |
| **Q.** If you multiply a given fraction by$\frac{1}{1}$, will its value change? What about for $\frac{2}{2}$, $\frac{3}{3}$,..., $\frac{n}{n}$?**Q.** If you know that two fractions have the same value, what strategy can you use to prove your claim? |
| Definition/Properties To Know |
| **Equivalent Fractions:** Suppose$\frac{1}{k}$ and$\frac{n}{m}$are two fractions with *k,m*$\ne $0. These fractions are equivalent provided they both represent the same number and are of the same size;$\frac{1}{k}=\frac{n}{m}$. (Alternate Definition): Provided that *r*$\ne $0, the fraction $\frac{n x r}{m x r}$ is equivalent to$\frac{n}{m}$.**Greatest Common Factor (GCF):** The GCF for integers *x* and *y* is the largest number (factor) that divides both *x* and *y* evenly. **Cross Multiplication:** If $\frac{a}{b}$ and$\frac{c}{d}$are two fractions, in which *b, d* ≠ 0, then *ad=bc.* |

*Warm-Up Activity:* See “WU 1”

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| Lesson (Introduction to Problem) |
| You and Giovanni are having a pizza party later tonight, and for this party you decide to order 2 pepperoni pizzas and 2 cheese pizzas. Your order of pizzas arrived, but upon opening the boxes, you noticed something strange. The first box of pepperoni pizza was cut into 8 slices while the second box of pepperoni pizza was cut into 16 slices. In addition, the first box of cheese pizza was cut into 6 slices while the second box of cheese pizza was cut into 18 slices. **Q.** For the case of pepperoni pizza, what fraction of the second box corresponds to **one slice** from the first box? 3 slices? 5 slices? 7 slices? Justify your answer with a diagram.**Q.** For the case of cheese pizza, what fraction of the second box corresponds to **one slice** from the first box? 2 slices? 4 slices? 6 slices? Justify your answer with a diagram.* Using a pencil, draw 4 circles (or another shape) to represent the 4 boxes of pizza and assign 2 circles to represent the boxes of pepperoni pizza and 2 circles to represent the boxes of cheese pizza.
* Outline the number of slices (pieces) for each pizza.
* (Pepperoni) One at a time, shade the number of pieces that represent *x* slices from the first box, and write out the fractions.
* Do the same for the second box, but instead of one slice, figure out how many slices from the second box corresponds to one slice. Shade pieces until the shaded regions for both cases should look the same.
* (Cheese) Repeat the same procedure as “Pepperoni.”
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| Materials (If Needed) |
| * Paper and Pencil
* Ruler (if necessary)
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*Main Project:* See “MP 1”

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| Closure/Expectations |
| Students will learn to generate equivalent fractions and prove that two equivalent fractions are the same because one fraction is a multiple of another. Students will also learn how to simplify a fraction by performing the opposite operation, in which the student will divide both the numerator and the denominator to obtain a simpler fraction.  |