**FRACTIONS**

Subject: *Multiplying Fractions by Whole Numbers* Grade: *5*

|  |
| --- |
| Common Core State Standards |
| **5.NF.4a:** Interpret the product ($\frac{a}{b}$ *x q)* as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operation *a x q ÷ b*. *For example, use a visual fraction model to show* $\frac{2}{3} x 4=\frac{8}{3}$*, and create a story context for this equation. Do the same with* $\frac{2}{3} x \frac{4}{5}=\frac{8}{15}$*. (In general,* $\frac{a}{b} x \frac{c}{d}=\frac{ac}{bd}.$  |
| Objectives |
| Students will learn not only multiply a whole number by a fraction (*ex.* $a⋅\frac{b}{c}$), but also visualize the result of *b* parts of a whole *a* that was divided/partitioned into *c* parts. |
| Launch Questions |
| **Q.** Can you extend the formula ($a⋅\frac{b}{c}$) to include unit fractions?**Q.** How does this theme relate to repeated addition? |
| Definition/Properties To Know |
| **Partition:** Synonym for “division”**Rule for Multiplying a Whole Number and a Fraction:** Given a fraction $\frac{b}{c}$, where c ≠ 0, and a whole number a, $a⋅\frac{b}{c}=\frac{a⋅b}{c}$. |

*Warm-Up Activity:* See “WU 4”

|  |
| --- |
| Lesson (Introduction to Problem) |
| You will be baking cookies for a bake sale and you need to buy enough cookie dough for the event. You will be making 3 different types of cookies. The list below shows how much cookie dough you need in order to make *x* amount of a desired cookie. * 12 chocolate chip cookies =$\frac{4}{13}$of cookie dough
* 15 sourdough cookies =$\frac{2}{11}$of cookie dough
* 10 oatmeal cookies = $\frac{4}{9}$of cookie dough

\*\*Express your answers as mixed numbers. **Q.** How much cookie dough should you buy if you want to make 60 chocolate chip cookies? **Q.** How much cookie dough should you buy if you want to make 120 chocolate chip cookies? **Q.** Repeat the first two questions with the other two flavors. * For these three questions, students will have to first determine how many batches of cookies they would have to bake in order to reach their desired amount. This means dividing the *desired amount* (60 or 120) by *x* number of flavored cookies. The result should be a whole number. Students can also add or multiply the number of cookies per batch until they reach the desired amount; they should keep track of the number of counts.
* Once students obtain the whole number *(a)* from following the previous step, they should multiply it by the portion ($\frac{b}{c}$) of cookie dough needed to make the desired amount of cookies. The formula for this step is: $a⋅\frac{b}{c}=\frac{a⋅b}{c}$.
 |
| Materials (If Needed) |
| * Paper and Pencil
 |

*Main Project:* See “MP 4”

|  |
| --- |
| Closure/Expectations |
| Students should feel comfortable solving and modeling the product of a whole number and a fraction. Students should visualize the repeated process but be encouraged to not use this method for solving the multiplication problems.  |