**FRACTIONS**

Subject: *Composing Decimal Fractions* Grade: *4*

|  |
| --- |
| Common Core State Standards |
| **4.NF.5:** Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fraction with respective denominators 10 and 100. *For example, express* $\frac{3}{10}$  *as* $\frac{30}{100}$*, and add* $\frac{3}{10}+\frac{4}{100}=\frac{34}{100}.$ |
| Objectives |
| Students will learn to apply their prior knowledge of decimals in order to compose and relate decimal fractions.  |
| Launch Questions |
| **Q.** What role does the place value of a decimal have when expressing the decimal as a fraction?**Q.** Why is the denominator of a decimal fraction a multiple of 10.  |
| Definition/Properties To Know |
| **Decimal Number:** A number that contains a decimal point followed by a series of digits whose value is less than 1. (*Ex. 2.35 is a decimal number and 0.35 < 1.*)**Decimal Fraction:** Fractions whose denominators are multiples of 10. (*Ex. 0.32 =* $\frac{32}{100})$**Different Ways to Represent Fractions:** The nouns represent the position of a digit in a given decimal. The value of a position to the right of another position is $\frac{1}{10}$its value, and the value of a position to the left of the same position is times$10$its position. *Ex. Ones =* $\frac{1}{10}$*of Tens, and Hundreds = 10x of Tens*

|  |  |
| --- | --- |
| Decimal | 653.238 |
| Mixed Number | 653 (238/1000) |
| Expanded Form | 600+50+3+(2/10)+(3/100)+(8/1000) |
| Expanded Form With Denomination Visible | (6 x 100)+(5 x 10)+(3 x 1)+(2 x (1/10))+(3 x (1/100))+(8 x (1/1000)) |
| Expanded Form with Place-Value Nouns Visible | (6 hundreds)+(5 tens)+(3 ones)+(2 tenths)+(3 hundredths)+(8 thousandths) |

 |

*Warm-Up Activity:* See “WU 9”

|  |
| --- |
| Lesson (Introduction to Problem) |
| Your school is running a pet-food drive for a animal shelter and, this year, you and 3 other friends have gathered boxes full of canned food. Each box is 10 units long and 10 units high, and each can has a size of 1 unit squared. The table below shows how many cans you and your group have collected.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NAME | You | Juan | Priscilla | Otis |
| CANS | 75 | 98 | 82 | 53 |

**Q.** What fraction of a box do you each have? Model each fraction using the Base 10 Blocks. **Q.** How many boxes do you all have in total? Note: An unfilled box is still considered one box.* Students should realize that the area of the box is 100 units squared, therefore 100 cans fill 1 box. Using this information, students can construct the fraction corresponding to the number of cans they have. Students should be advised to not simplify their fractions because, for the next question, they would have to find the sum.
* To model the problem, students should think about the value of the base 10 blocks. The giant square represents has an area of 100 units squared, like our box. The row piece contains 10 units and the small individual pieces represent 1 unit each. Students would have to express the amount of cans they have using the blocks.
* To find out how many boxes there are in total, students would have to start out with the bigger pieces and work work their way towards forming a square of area 100 unit squared. The small individual pieces will accumulate to a unfinished box.
 |
| Materials (If Needed) |
| * Paper and Pencil
* Base 10 Blocks
 |

*Main Project:* See “MP 9”

|  |
| --- |
| Closure/Expectations |
| Students should be able to convert a decimal into a decimal fraction, and vice versa. They should also understand the relationship between place value and the denominator of a decimal fraction.  |