AMA
LEARNING

Decimals: Notes

What are decimals?
- Decimals are **parts of a whole**; they are fractions of a whole number
- They can **represent the same numbers as fractions**
- They can exist on their own (with a zero on the whole number side of the dot, Ex: 0.<u>23426</u> or with a whole number on the other side of the dot, Ex: 8.<u>45634</u>)

How to convert decimals to fractions?
1. **Take the decimal and put in a fraction-like form over 1:**
   $$\frac{0.25}{1}$$
2. **Multiply the top and the bottom of the fraction x100:**
   $$\frac{0.25 \;_{x100}}{1 \;_{x100}}$$

   $$= \frac{25}{100}$$
3. **Simplify the fraction:**
   $$\frac{25 \div 25}{100 \div 25}$$

   $$= \frac{1}{4}$$
4. **Smile because your decimal is now a fraction and most math teachers prefer fractions!**

What about percentages?
- **To turn a decimal into a percentage, just move the decimal point two places to the right, or this way: →**
  - **Then, remove the decimal point and add a % at the end!**
- **Decimal:**
  - **0.02 → → 002.**

■ **Take away the zeros in front and the period and you'll see that 0.02 is equivalent to 2%**

How do you round decimals?
- **Most times when working with decimals throughout your math class career, the worksheet will ask you to round to a certain decimal, or you will find it convenient to do so yourself.**
- The problem will most likely ask you to round to the nearest tenth or hundredth of a decimal.
    - The nearest tenth decimal place is right here: 0.**1**
    - The nearest hundredth place is right here: 0.1**1**
    - The nearest thousandth is here: 0.11**1**
- When rounding to any decimal place, you need to look at the digit in the place you know will be the end of your new rounded number and the digit right next to it on the right (→) side. If the digit on the right side of your last digit is 4 or below, you will cut off the rest of the numbers including your right side digit, and that will be your new number:
    - Example: You have 0.344 and you need to round to the nearest hundredth. You will look at the 4 in the middle, the number you need as your last number, and the 4 at the end, the number that determines what happens to your last number. 4 and under means you keep the rest the same, so your rounded answer would be:
        ■ 0.34
- If the digit on the right side of your last digit is 5 or above, you will cut off the rest of the numbers including your right side digit, and you will raise your last digit up one whole number digit:
    - Example: Say you have the decimal: 3.7846534
    - Your teacher tells you to round to the nearest thousandth, so you look at the 3rd and 4th decimals from the decimal point, which in this case are 4 and 6. You would see that 6 fits into the category of 5 or above, which would mean you would raise the value of the number in the thousandth place one whole digit. Your rounded answer would be
        ■ 3.785

What are repeating/recurring decimals?

- **Repeating or Recurring decimals are decimals are decimals that go on forever and never stop. They repeat the same pattern of numbers again and again**
  - Pi is **NOT** a recurring/repeating decimal! It is a non-terminating, non-repeating decimal. It never repeats the same pattern of numbers
- Example: $1 \div 3$ or the fraction ⅓ is a recurring decimal. It looks something like 0.333333333… and it goes on forever.
  - This can also be written:
  - With a line over the repeating number, sort of like this: $0.\overline{33}$

How to add and subtract decimals?

- **To add and subtract decimals, you do the same thing as regular addition and subtraction, but you have to remember to keep the decimal points in place!**

How to multiply and divide decimals?

- **To multiply decimals, you do so in the same way you multiply other numbers, but you just have to remember to keep the decimal point in place!**
- **To divide decimals, you should divide them with long division**
1. **You take the divisor and make it have a whole number if it doesn't already: 0.34 to 3.4**
2. **You take the dividend and move it the same amount of points as you did the divisor: 16.45 to 164.5**
3. **Line up the decimal point in the quotient with the decimal point in the dividend:**

$$\overline{.}$$
$$3.4\overline{)164.5}$$

4. **Divide as usual!**