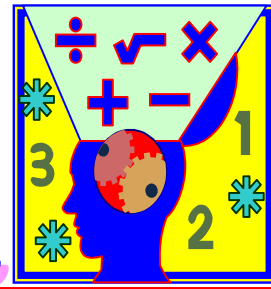


Algebra Connections

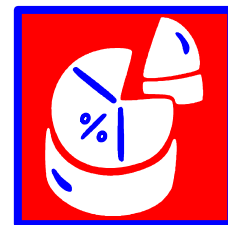


Mr. Breitsprecher's Edition

January 18, 2005

FREE!

Decimals & Percents



Decimals are a method of writing fractional numbers without writing a fraction having a numerator and denominator.

The fraction $7/10$ could be written as the decimal 0.7 . The period or decimal point indicates that this is a decimal.

If a decimal is less than 1, place a zero before the decimal point. Write 0.7 not $.7$

There are other decimals such as hundredths or thousandths. They

all are based on the number ten just like our number system. A decimal may be greater than one, 3.7 is an example.

The fraction $37/100$ could be written as the decimal 0.37 . The period or decimal point indicates that this is a decimal. Of course, a decimal with one hundredths decimal may be greater than 1.

Decimal numbers, such as 0.6495 , have four digits after the decimal point. Each digit is a

different place value.

The first digit after the decimal point is called the tenths place value. There are six tenths in the number 0.6495 .

The second digit tells you how many hundredths there are in the number. The number 0.6495 has four hundredths.

The third digit is the thousandths place.

The fourth digit is the ten thousandths place which is five in this example.

Therefore, there are six tenths, four hundredths, nine thousandths, and five ten thousandths in the number 0.6495 .

If there are two decimal numbers we can compare them. One number is either greater than, less than or equal to the other number.

A decimal number is just a fractional number. Comparing 0.7 and 0.07 is clearer if we compared $7/10$ to $7/100$. The fraction $7/10$ is equivalent to $70/100$ which is clearly larger than $7/100$.

Therefore, when decimals are compared start with tenths place and then hundredths place, etc. If one decimal has a higher number in the tenths place then it is larger than a decimal with fewer tenths. If the tenths are equal compare the hundredths, then the thousandths etc. until one decimal is larger or there are no more places to compare. If each decimal place value is the same then the decimals are equal.

Sound simple – great! This is the foundation of percentages, a very important tool for analysis.

Fractions = Decimals = Percents

To write decimals as fractions, use the “placeholder” as the denominator and write the number (without the decimal) as the numerator.

To write fractions as decimals, divide the numerator by the denominator.

To write a percent as a decimal, drop the % symbol and move the decimal points two places to the left.

To write a decimal as a percent, move the decimal point two places to the right and attach the % symbol.

To write fraction as a percent, write the decimal as a fraction (above), perform that division, and multiply by 100.

To Add or Subtract Decimals

1. Write the decimals so that the decimal points line up vertically.
2. Add or subtract for whole numbers.
3. Place the decimal point in the

sum or difference so that it lines up vertically with the others.

To Multiply Decimals

1. Multiply the decimals as though they are whole numbers.
2. The decimal point in the product is placed so that the number of decimal places is equal to the SUM of the number of decimal places in the factors.

To Divide Decimals

1. Move the decimal point in the divisor to the right until the divisor is a whole number.
2. Move the decimal point in the dividend to the right the SAME NUMBER OF PLACES as the decimal point was moved in step 1.
3. Divide. The decimal point in the quotient is directly over the moved decimal point in the dividend

Mr. Breitsprecher's "Tech Connect"

Decimals & Percents

Widgets by Plant	As Fraction	Fraction As % of Whole	As % of Total
Pant 1	342.166	342 1/6	16.66666667
Plant 2	30.9	30 9/10	24.64449928
Plant 3	7.9558	7 65/68	
Plant 4	61.619		
Plant 5	0.13209		
Plant 6	38.87		
Plant 7	45.4		
Plant 8	75		
Plant 9	37.39		
Plant 10	94.728		
Plant 11	56.2		
Plant 12	57.16		
Plant 13	6.251		
Plant 14	52.6		
Plant 15	32.14		
Plant 16	99.34		
Plant 17	26.2		
Plant 18	99.3302		
Plant 19	15.229		
Plant 20	53.7		
Plant 21	8.268		
Plant 22	44.5		
Plant 23	56.5801		
Plant 24	46.748		
Total	1388.40719		

What's A Widget?

A "widget" is an imaginary unit of production – it is often used in Economic classes to illustrate ideas (it is easy to create data for imaginary units – virtually anything works!)

Please create the spreadsheet on the left, using **ALL HEADINGS** including **PLANT Numbers**. **ONLY ENTER THE DATA FOR THE UNITS OF PRODUCTION** (second column) when you start. We will enter the information under: As a Fraction, Fraction as % of Whole, as % of Total, and Total later by applying our Decimals & Fraction Review, using formulas or functions as appropriate.

Please apply **BOLD** as illustrated to the left. If you have any problems entering the numbers, it is usually because **EXCEL** has defaulted to one format (for example, **DATE**), when we are looking for another format (i.e. number). **ONLY USE A "GENERAL" NUMBER FORMAT.**

If you have any questions or problems, **PLEASE ASK A CLASSMATE OR YOUR INSTRUCTOR.** This activity is written to assume that students have worked with **EXCEL** enough that specific directions about the software are not needed. Please do not feel shy or hesitate to ask for assistance if necessary.

PROCEDURE

Once you have entered the information per the instructions under the section, **WHAT'S A WIDGET**, let's review our concepts from our Review Chapter, Decimals and Percents. Please follow the directions carefully and do not use any other formats, functions, or MS EXCEL features. You will Email this to your instructor and no credit will be given for projects that have not applied the review principals in this project.

1. The column, **AS A FRACTION** will be used to re-write the decimal portion (partial unit) of each plant's production as a fraction (including the whole number of units). Simply **RE-ENTER THE WHOLE NUMBER FROM EACH DECIMAL** and then **ENTER A SPACE**.
2. Express the partial unit, after that space, by **RE-ENTERING THE DECIMAL PART OF THE NUMBER** (without the decimal), **FOLLOWED BY /** (for the fraction bar) and then the **DECIMAL PLACEHOLDER** (10, 100, 1000, or 10000).
3. Note how **EXCEL** will re-calculate the fraction in its simplest term. (Note examples above). For this class, **ALL FRACTIONS IN FINAL ANSWERS MUST BE SIMPLIFIED!**

4. Use **AUTOSUM** (or **SUM FUNCTION**) to total the number of widgets for **ALL** plants (cell **B26** in my example, if you have different cells, adjust accordingly).
5. Next, in **COLUMN C**, create a formula that will convert the fraction in **COLUMN B** (**DO NOT INCLUDE THE WHOLE NUMBER**) to a **PERCENT OF WHOLE**. Note that from our review, this involves writing the decimal as a fraction, performing the indicated division, and the results multiply by 100. Please also note that we always started with a fraction that was less than 1 – our calculated percentage, therefore, has to be less than 100. (In example shown, =1/6*100)
6. Next, we will calculate each plants output as a percentage of the total. Note that each plant only represents a small fraction of the total. The percentage of each plant's output to the total **MUST BE LESS THAN 100**. The sum of these percentages **MUST EQUAL 100**. Therefore, we will create a formula that will divide each plants output by the total of all plants. To simplify things, use an **ABSOLUTE CELL REFERENCE** and **FILL** this formula down. In this example, I used =B2/SB\$26*100
7. Use **AUTOSUM** to verify that the percentages in this column total to 100 and add the three borders that are shown in the example. Be sure all headings and data are displayed.
8. Save your work to your stustorage account. Your instructor will give directions to Email this assignment in to earn credit.