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| Teacher | Pamela Walsh |
| School/District | South Shore Vocational High School |
| Subject Area(s) | Algebra I |
| Grade Level(s)/Course | 9th |
| Lesson/Unit Duration | Excel |
| Date Submitted | 11/19/12 |

**Southeast Technology Network Grant Project**

**Lesson Plan Template**

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| Lesson/Unit Title |  | |
| Lesson Goals | Students will be able to create a spreadsheet using Microsoft Excel*.* The first part of this lesson will introduce the basics of setting up a spreadsheet, making headings, merging cells, centering, copying, and entering simple equations. The second part of the lesson will have students learning how to enter data and then enter formulas to calculate with the data more independently, and finally how to use the graph features to show the data in graph form. | |
| Lesson Objectives | Students will demonstrate an understanding of Excel by creating a spreadsheet while using a screen cast to show they understand how to setting up a spreadsheet, making headings, merging cells, centering, copying, and entering simple equations. | |
| Curriculum Frameworks Standards Addressed (Copy and past # and text of  standards) | A-CED1 | |
| Learners | | |
| Characteristics of Learners:  This lesson will be taught to the entire Freshman class consisting of all types of learners. | | Meeting the Needs of all Learners:  Having students watch a screencast developed to show how to use Excel will give students the opportunity to watch and re-watch the demonstration until they understand what to do. |
| Technology/Resources Needed:   * Computer Lab with Microsoft software installed and internet access to use screencast-o-matic * Headsets with microphones | | |
| Levels of Critical Thinking | *Check all that apply*  \_X\_\_Remembering \_X\_\_Applying \_\_\_Evaluating  \_X\_\_Understanding \_\_\_Analyzing \_X\_\_Creating | |
| 21st Century Learning and Innovation Skills\*\* | *Check all that apply*  \_X\_ Creativity and Innovation  \_\_\_ Critical Thinking and Problem Solving  \_X\_\_ Communication and Collaboration  \_X\_\_ Information, Media, and Technology Skills | |
| 1. *Instructional Plan* | | |
| Introduction/Pre-Instruction:  Define what a spreadsheet is including all appropriate vocabulary and show an example of a spreadsheet already created. | | |
| Instruction | | |
| Teacher Role:   * Create a screen cast that shows how to set up a spreadsheet, making headings, merging cells, centering, copying, and entering simple equations. * Monitor and answer questions as students work | | Student Role:   * Students will watch the screen cast created by the teacher. * Students will complete the Intro to Excel worksheet and create the spreadsheet described (attached) |
| Closure  Students will be given an assignment where they will have to create a spreadsheet and screen cast where they will show they know how to create a spreadsheet with appropriate headings and font. They will also have to use simple formulas to create accurate information based on what is given. An example of an assessment is attached. | | |
| Assessment *How will you know students reached lesson goals?*  Assessment the screen cast created by the student. | | |
| Reflections on Lesson | | |

\* Massachusetts Curriculum Frameworks found at <http://www.doe.mass.edu/frameworks/current.html>

\*\* Partnership for 21st Century Skills, P21 Framework Definitions found at <http://www.21stcenturyskills.org/documents/P21_Framework_Definitions.pdf>

Massachusetts Technology Literacy Standards and Expectations found at <http://www.doe.mass.edu/edtech/standards/itstand.pdf>

**Introduction to Excel Spreadsheet Program**

A spreadsheet allows you to collect, sort, manipulate, and graphically represent all sorts of data. It also is an excellent tool for solving algebra problems!

Today you will open a spread sheet and “play” with it, learning what the different menus allow you to do. Let’s start!

1. Go to the START menu on the bottom left of the computer screen. Under “All Programs” find Microsoft Excel. If someone else has used the machine for Excel before you, then the Excel may be in the space above “All Programs” where frequently used programs are automatically kept.
2. Click on Excel and it will open a new “workbook” called “Book1”. If you look at the bottom, you will see Sheet 1, Sheet 2 and Sheet 3. We will start by working on Sheet 1.
3. To start we will name this workbook with your name. Go to **File—Save As.** If given a choice choose Save as: Excel 97-2003 workbook. This way I can open it, even on my computer that uses an older version. Save it with your name: “Sam Smith’s workbook”. PLEASE save often!! Save your workbook on the desktop.
4. Each little box in the worksheet is called a ***cell*** and has a location name. In your new sheet you are automatically in cell A1. Above the cells you will see an empty line with the symbol ***f(x)*** in front of it. If cell A1 is highlighted, you can type **Student Name** in this f(x) line and it will appear in cell A1. OR, you can go to cell A1, double click and type.
5. Notice that **Student Name** doesn’t fit in the box. Make the cursor go up to the line between **A** and **B**. When the cursor turns into a small vertical line with horizontal arrows going through it, hold the cursor down (left click) and drag it until it is wide enough to accommodate what you have written.
6. In Column B, type in **Day 1,** Column C: **Day 2**, until you have up to **Day 5** (Column F). In Column G, write **TOTAL**
7. Go back to A1 and drag the cursor across this entire row (***rows*** go across, ***columns*** go up and down) until all your headings are highlighted. Bold AND center the column headings.

Enter the following data for the following students selling raffle tickets: (**DO NOT** type the $ signs. We will learn how to do that later!!) Use the tab button to move to the next cell on the right. Leave the Totals blank.

1. Fred: Day 1: $12; Day 2: $10; Day 3: $25; Day 4: $13; Day 5: $12

Betty: Day 1: $8; Day 2: $30; Day 3: $16; **(grab the little black square at the bottom of the cell and drag it to fill in Day 4 and 5.)** Day 4: $16; Day 5: $16

Wilma: Day 1: $24; Day 2: $20; Day 3: $35; Day 4: $18; Day 5: $12

Barney: Day 1: $14; Day 2: $4; Day 3: $15; Day 4: $28; Day 5: $15

1. Bold the students’ names. Save.
2. Now we would like to total the amount of money raised by each student.

Go up to the formula line (f(x)). **IMPORTANT:** any time you want to do a calculation, you MUST enter an equal sign first. If you find that your formula won’t calculate, then you probably forgot to start with =.

1. You want to total the money Fred raised. In order to do this, you have to tell the spreadsheet what cells you want it to work with AND you have to tell it what operation(s) to do. In our case we are simply adding, or summing. Highlight the cells that have the money that Fred raised, then choose Auto Sum ( looks like: **∑** ). In the newer version, it automatically adds the highlighted numbers and puts the sum in the cell next to the highlighted ones.
2. Total each student’s money. Then in cell F7 write **Grand Total.** In order for this to fit in that cell, you will need to reduce the size of the font.
3. Another way to sum a row or column of numbers is to go to the cell where you want the answer to reside, in our case cell G7. Then type =SUM(G2:G5) and hit enter, because we are adding up the total of the column of student totals. The student totals are in cell G2 – G5.
4. In cell A9 write **Average Sales Per Day.** You will probably need to widen Column A and/or change the font in order for this to fit.
5. Go to cell B9 and type in a formula that will allow you to average the sales for Day 1. Remember: start with an = sign AND think about order of operations for the averaging. In order to average, first we add, then we divide. But in order of operations, division comes first, so think about how to get the spreadsheet to add first, THEN divide.
6. Once you have a workable formula in cell B9, drag the little black square at the bottom right of the cell across until you have averaged all the days’ sales.
7. Highlight all the days sales (B2 – G5). While they are highlighted, look for a **$** in the menus at the top of the spreadsheet. Click on it. All your numbers should now look like money!
8. Do this for any other cells that have numbers.
9. Right click on the words SHEET1 at the bottom of the page. Choose the “Rename” option and name this sheet: **Raffle Sales.** Save.
10. Make this worksheet yours by changing fonts, colors, etc. Save.

# Excel Assessment

Marvin is a freshman Algebra student at Hope High School. His teacher gives him a grade report the third day of every academic cycle. The report tells him what his overall grade (percent) is, but it does not break it down by category.

Marvin is curious why he is not doing as well as he thinks he should be. When he looks at the right hand column of his grade report he sees lots of 100%s and can’t figure out why he is not doing better.

Below is Marvin’s grade report:

**Marvin - Absent 3 times in 2 cycles.**

**77.5%**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | **Category** | **Assignment** | **Score** | **Grade** |
| 1/4  1/5  1/6  1/6  1/7  1/8  1/8  1/11  1/11  1/12  1/22  1/22  1/25  1/26  1/27 | Test  Homework  Homework  Quiz  Homework  Classwork  Homework  Quiz  Homework  Classwork  Homework  Test  Classwork  Homework  Quiz | Ch. 3 Test  p. 125 1-15 odd  p. 130 17- 25 all  Solving Multi-Step Eq  p. 133 wd probs  Wksht with partner  Wksht A #s 9 -17 alll  Solving inequalities  Wksht B all  Abs. value lab  Solving abs. val. eq  Ch. 4 Test  Slope lab  Slopes and stories  Identifying types of Slopes | 52/60  3/4  4/4  10/15  4/4  5/5  4/4  21/30  4/4  8/10  4/4  32/55  8/10  4/4  10/10 | 86%  75%  100%  67%  100%  100%  100%  70%  100%  80%  100%  58%  80%  100%  100% |

You are to create a spreadsheet that breaks his scores down by categories so he can see how he is doing in each area. Put this on Sheet2 of your workbook. Label it “Marvin’s grades”.

Your first category is Homework. Merge 2 cells for the major category Homework by highlighting the 2 cells and then ask the spreadsheet to merge the 2 cell into one cell (in the older version this is under Format – Cells – Alignment – Merge. In the new version it is under the Home tab – Merge and Center). Write **Homework** in the merged cell.

Under the category Homework you will need one column that is Marvin’s actual score (points) and a second column that represents the total points he COULD have gotten. After you get this data in the spreadsheet, calculate his AVERAGE HOMEWORK grade (think about what your formula will look like) and then another box that turns his average to a percent. Be sure to label it HOMEWORK GRADE %. (Think about how to change a number into a percent: what will your formula look like?)

Then go on to create columns for Classwork, Quizzes, and Tests and calculate the grades (percents) for each for each of those categories.

Average all the percents to get an AVERAGE PERCENT. Does it match up with what his teacher says his grade is?

When you are ALL done, ask the spreadsheet to sum the number of hwk points that Marvin earned (put that somewhere in Col. A) and to sum the number of hwk points he COULD have earned (Col B). Ask the spreadsheet to calculate the percent for hwk points.

Do this for each of your categories.

FINALLY, ask the spreadsheet to add up all the points he ACTUALLY earned over all the categories. Ask it also to add up all points he COULD have earned over all the categories. Turn this to a percent. Label it ACTUAL PERCENT. Does it match with what his teacher says his grade is?

Why is the AVERAGE PERCENT not the same as his ACTUAL PERCENT?

**Excel Extended**

Play around with Excel: can you figure out how to create a graph of Marvin’s progress report? Try making a bar graph and a circle graph.

If you finish up, let’s try something different. You get to play teacher and decide how to give Marvin’s final grade.

Right now all categories are equally weighted to decide his final grade (in other words, we added up all his points for all categories and then divide by the total points to get his grade). I want you to try something different:

* Will you average his achievement scores (tests, quizzes, projects) and “weigh” them a certain percent, then do the same for his work habits scores (homework, labs,attendance) and weigh them a different amount?
* Will you average each of the categories listed in the progress report and treat each category equally or weigh each category a certain percent?

*NOTE: When dealing with percentages and categories, the percentages must total to 100%. For instance, if breaking into Achievement and Work Habits, I might say Achievement is 70% and Work Habits is 30%. If dealing with 4 separate categories, I might say Tests/Quizzes 60%, Classwork/Labs 15%, Homework 10%, and Projects 15%.*

* Explain why you would choose one way over another to calculate Marvin’s grade.
* On your spreadsheet, calculate Marvin’s grade using your grading method.
* Try creating a graph of this new grade.

**Introduction to Excel**

* **What is a spreadsheet?**

A spreadsheet is a document that stores data in a grid of horizontal rows and vertical columns. **Rows** (go across) are typically labeled using numbers (1, 2, 3, etc.), while **columns** (go down) are labeled with letters (A, B, C, etc). Individual row/column **locations, such as C3 or B12**, are referred to as **cells**. Each cell can each store a unique instance of data. By entering data into a spreadsheet, information can be stored in a more structured way than using [plain text](http://www.techterms.com/definition/plaintext) . The row/column structure also allows the data to be analyzed using formulas and calculations. (from <http://www.techterms.com/definition/spreadsheet> )

* **Why is a spreadsheet a great place to store data?**
* **What is a cell? How is a cell named?**
* **How do you merge cells?**
* **When entering an equation, what do you have to remember to do FIRST?**

**Let’s try:**

* Merge the first 3 cells and type in John Smith’s name
* Highlight his name, change the font, make it bold.
* Widen Column A just a little and type in: Hwk Scores
* Do the same for Column B. Type in: Quiz Scores
* In Column C type in: Projects. Fix width if needed.
* Bold all the headings.
* Under the Hwk Scores column, enter this data: 2, 2, 4, 4, 4, 4, 2, 0, 2, 4, 4, 4
* Under the Quiz scores, enter this data: 10, 15, 9, 5
* Under Projects enter: 32, 10
* In A15 type Total hwk pts. Bold; reduce font size if needed.
* In B15 type Total Qz pts. Bold; reduce font size if needed.
* In C15 type Total Proj pts. Ditto.
* Starting in A2 and ending in A16m highlight the column, then click the SUM button (looks like a funny E). It should add up all the hwk scores for you!
* Do the same for the Quiz and Project columns.
* In A17, type: Total Poss. Pts. Copy and paste this into B17 and C17. Reduce size as necessary
* In A18, type: 48 In B18, type: 46, and in C18 type: 44
* In A19 type: Your Hwk %. In B19, Your Quiz %, and in C19, Your Proj %. Bold all these.
* In A20 you need to type in a formula to find his hwk percent. That means you need to start by typing in =, then click on the cell with his hwk total, then the divide button (/), then click on the cell with the total possible hwk pts. Hit enter. This will give you a decimal (You should see .75). Turn it to a % by going back into the cell and selecting the % button up top.
* Repeat the process for the other 2 columns.
* Now to calculate his total grade, we need to know how the different assignments are weighted.
* Let’s say that hwk is 10%, quizzes account for 60% of his grade, and projects are 30% of his grade.
* In A22, type (all in caps and bold) TOTAL GRADE:
* Then in B22 we need to enter the formula that will put all this together: Start with an = sign, then click on the cell that has his hwk %, times .10, plus his quiz %, times .60, plus his project %, times .30. Now hit enter and you should get a number which represents his percent. You will have to go back into the cell and then select % from above. Do you come out with 87%? If yes, hooray! Bold it and make it size 14.

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**Marvin**

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