

# **TIES** 2003

Teachers in Industry for Educational Support

## **S<sup>3</sup>C Sidewalks, Streets, and Sewers of Centerville**

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# S<sup>3</sup>C Sidewalks, Streets, and Sewers of Centerville

## Curriculum Unit Overview

### Summary

This curriculum unit will cover measurement, calculations, map reading and spreadsheet usage. Calculations of area, volume, conversion rates, and how one input affects another input are all things that we can find in spreadsheets. We will use this lesson to get students excited about spreadsheets and for them to be able to use this as an organizational tool as well as for personal use. The grade level for this unit is 8th-12th grade and will vary according to what lessons are used.

### Big Picture

Have the student pick a career that interest to them. Then have them visit the web site [www.salary.com](http://www.salary.com) and locate their career. Not only does it give you the salary, but it also gives you a description of the job. Students will write down their salary and then visit the financial spreadsheet and enter in their salary. The spreadsheet will calculate the amount taken out for taxes. From there, students will enter in their estimated amounts for fixed and variable expenses. From this assignment students will be excited about using spreadsheets to figure out a real life problem.

### Preparation for the Unit

In the first section Excel in Your Life, in Alt 3, you may need a school counselor or a combination of someone who can talk about grade point average and someone else to talk about how to calculate it. In the Second section the testing of websites would be a good idea before you try and bring it up on a school computer. Some school systems may have internet filters that will not let you on certain site. For the third section in one of the Alts, you will have to locate apartment guides, and auto guides or websites for both. In the Alt titled Anytown USA you will need maps to complete. We put Centerville, OH maps but any map will do with a little tweaking. For the whole unit computers and computer disks will be needed. For the Cumulating activity a speaker or speakers from your local City Managers office may be needed. The speaker should be able to talk about Excel and the way that the program helps them run the day to day of the city.

### Overview

On the following page is a summary of the unit including brief summaries of each Authentic Learning Task (ALT). This table provides an overview of the tasks in the unit sections and shows how the activities in the different teaching areas relate to each other.

## S3C Sidewalks, Streets, and Sewers of Centerville Curriculum Unit Summary

Excel in Your Life	Using Excel in Math	Mapping Out Your Life
<p><b>ALT 1 - Back to the Basics</b> In a self-guided process the student will learn the basic workings and vocabulary of Excel.</p>	<p><b>ALT 1 – Then, Now and Later</b> Students are given the costs of an item from the past and present and will be able to determine the costs for years between.</p>	<p><b>ALT 1 – Finances</b> Students will pick a career and then look up the salary, apartment rent, car loans, etc. The spreadsheet will then tally up how much money they have left to spend and save.</p>
<p><b>ALT 2 – You Say It's Your Birthday</b> In a self - guided process the student will learn about functions, use functions and learn more advanced vocabulary.</p>	<p><b>ALT 2 – Olympic Data</b> Students will find data on an Olympic Event that both men and women participated in and make a line of regression to see when the men and women will tie.</p>	<p><b>ALT 2 – Anytown USA</b> Using Centerville maps, students will be looking up certain streets and use conversions, area, and distance formulas.</p>
<p><b>ALT 3 - GPA and You.</b> In a project, the students will learn how their GPA is calculated and how it can effect the other parts of their life.</p>	<p><b>ALT 3 – Allowance</b> Students will be given the choice as to whether they would like 1 million dollars a day for a month, or if they would rather have 1 dollar doubled each day.</p>	<p><b>ALT 3 – Road Trip?</b> Students will figure the cost of a road trip using various websites and mathematical formulas.</p>
<p><b>Culminating Activity</b> For the Cumulating activity a speaker or speakers from your local City Managers office may be needed. The speaker should be able to talk about Excel and the way that the program helps them run the day to day of the city.</p>		

## **Section One: Excel in Your Life**

### **ALT One: Back to the Basics**

#### **Summary**

In these sections students will learn the beginning usefulness of the Excel Spreadsheet.

#### **Competencies**

1. Students will learn basic vocabulary of the Excel program including words such as: cell, column, row, copy, and paste.
2. Students will learn how to use the basic toolbars and shortcuts with the mouse and keyboard.
3. Students will learn how to put basic information and pictures into Excel, and make it more pleasing to others.
4. Students will learn how to sort information.

#### **Time**

The student will need to collect some information before they get started. The actual time for completing the project will be between 45 - 60 min.

#### **Materials**

Computers with Excel  
3.5' computer disk  
Student collected information.  
Worksheet for each student.

#### **Instructions**

I have designed this ALT to be self-guided. The worksheet provided walks students through the step by step for the project. There will be students who are very good at the program and others that will not be as good. The one suggestion that I have for the teacher doing this is to be comfortable with the program themselves.

#### **Evaluation/Assessment of Student's Competency**

To evaluate this project, take the print out of their address sheet and the answer to the questions on the worksheet and use the rubric that is provided.

## Closure

To close out this project I would talk about the usefulness of what they have done. I might talk about what other uses there are for Excel as a record keeper in their lives (keep track of CD's, video games, baseball cards, and any collections they may have.) Then you could talk about other careers that use the Excel program.

## Making a: **Address Book**

Teacher name: \_\_\_\_\_

Student Name \_\_\_\_\_

CATEGORY	4	3	2	1
<b>Required Elements</b>	The address book includes all required elements.	Most required elements are included.	All but 2 of the required elements are included on the address book.	Several required elements were missing.
<b>Attractiveness</b>	The address book is exceptionally attractive in terms of design, layout, and neatness.	The address book is attractive in terms of design, layout and neatness.	The address book is acceptably attractive though it may be a bit messy.	The address book is distractingly messy or very poorly designed. It is not attractive.
<b>Labels</b>	All items of importance on the address book are clearly labeled.	Almost all items of importance on the address book are clearly labeled.	Several items of importance on the address book are labeled.	Labels are too small to view OR no important items were labeled.
<b>Knowledge Gained</b>	Student can accurately answer all questions related to the address book and processes used to create it.	Student can accurately answer most questions related to the address book and processes used to create it.	Student can accurately answer about half of questions related to the address book and processes used to create it.	Student appears to have insufficient knowledge about the address book or processes used in it.
<b>Grammar</b>	There are no grammatical mistakes on the address book.	There is 1 grammatical mistake on the address book.	There are 2 grammatical mistakes on the address book.	There are more than 2 grammatical mistakes on the address book.

## **Section One: Excel in Your Life**

### **ALT Two: You say it's Your Birthday.**

#### **Summary**

In this section the student will learn about more advanced parts of the Excel program.

#### **Competencies**

1. The student will learn what a function is, how a function works, and where it can be used.
2. The student will learn more advanced vocabulary such as insert.
3. The student will learn about the different cursors that appear in the Excel program and what each one does.

#### **Time**

30 - 45 minutes to complete worksheet and project.

#### **Materials**

Computers with Excel  
3.5" computer disk  
Worksheet for each student

#### **Instructions**

This ALT is designed to be self-guided. The worksheet provided walks students through the step by step for the project. There will be students who are very good at the program and others that will not be as good. The one suggestion that I have for the teacher doing this is to be comfortable with the program themselves, especially if you have never done functions and or equations.

#### **Evaluation/Assessment of Student's Competency**

To evaluate this project take the print out of their birthday sheets and the answer to the questions on the worksheet and use the rubric that is provided.

#### **Closure**

To close out this project I would talk about the usefulness of what they have done. I might talk about what other uses there are for Excel as a Tracking system in their lives (How long it has been since the last oil change, days till the next paycheck, length between dentist, days till the braces taken off, days till your project is due.) Then you could talk about other careers that use the Excel program.

## Making a: **Birthday Chart**

Teacher name: \_\_\_\_\_

Student Name \_\_\_\_\_

CATEGORY	4	3	2	1
<b>Required Elements</b>	The birthday chart includes all required elements.	Most required elements are included.	All but 2 of the required elements are included on the birthday chart.	Several required elements were missing.
<b>Labels</b>	All items of importance on the birthday chart are clearly labeled.	Almost all items of importance on the birthday chart are clearly labeled.	Several items of importance on the birthday chart are labeled.	Labels are too small to view OR no important items were labeled.
<b>Knowledge Gained</b>	Student can accurately answer all questions related to the birthday chart and processes used to create it.	Student can accurately answer most questions related to the birthday chart and processes used to create it.	Student can accurately answer about half of questions related to the birthday chart and processes used to create it.	Student appears to have insufficient knowledge about the birthday chart or processes used in it.
<b>Grammar</b>	There are no grammatical mistakes on the birthday chart.	There is 1 grammatical mistake on the birthday chart.	There are 2 grammatical mistakes on the birthday chart.	There are more than 2 grammatical mistakes on the birthday chart.

## **Section One: Excel in Your Life**

### **ALT Three: GPA and You.**

#### **Summary**

In this ALT the students will create a spreadsheet where they can keep track of their GPA.

#### **Competencies**

1. The Students will learn what a GPA is, how it is calculated and why it is important to them.
2. The students will learn more Excel vocabulary and tools.

#### **Time**

This is a take home project that the students will be able to work on at home if they have computers. I would also give class time to complete this assignment.

#### **Materials**

Computers with Excel  
Worksheet for each student

#### **Instructions**

1. This project is for the students to use their knowledge in the Excel program to calculate their GPA.
2. You may want to get a guidance counselor to talk to the students about GPA and its relevance to activities during and after high school. Also how one might calculate the GPA for a year and overall.
3. Make sure you download the example GPA (take a look at the printed out worksheet at the end of this document). It is a spreadsheet that has the GPA calculated on a 4.0 scale.

#### **Evaluation/Assessment of Student's Competency**

The rubric is provided on the student worksheet.

#### **Closure**

The students can close this ALT if you have at least one student take the Extra Credit. You can ask questions to the student and other students to see what they learned and how this program will help them excel in life.

## Section Two: Excel in Math

### ALT One: Then, Now and Later

#### Summary

Students will learn how the cost of food items changed from the past to the future. Estimates of prices for years between will be determined by making up an equation, and then looking at a table of values and a graph.

#### Competencies

1. 5 items are given with a present cost and a past cost. Students will be finding the slope, y-intercept, the equation of the line that makes up the 2 points, and then construct a graph of the equation.
2. With the graph students will determine how much each item is for a year between the 2 years given.
3. Students will also have to find the percent increase or decrease for each item.

#### Time

2 hours

#### Materials

Computer with Excel

Worksheet - Excel in Math ALT One- Then, Now and Later

#### Instructions

Over the years the cost of living has increased along with prices of items such as eggs, sugar, coffee, and gas. How much of an increase or decrease does each item have? How would you graph each of the items? In groups of 2 you will come up with a slope, y-intercept, equation of a line, and a graph of the line. When the line has been drawn you will then find out how much this item costs for instance, in 1985 by using the graph. After completing the graph you will find the percent increase or decrease.

#### Evaluation/Assessment of Student's Competency

Student papers will be turned in and graded.

#### Closure

Students will discuss the changes over the years for the costs of living.

## Section Two: Mapping Out Your Life

### ALT Two: Olympics

#### Summary

Students will find and record data into an Excel Spreadsheet. The data recorded will then be graphed and a line of regression (trendline) will be made and analyzed into a newspaper article.

#### Competencies

1. Students will learn how to enter data into an Excel Spreadsheet.
2. Students will be shown how to graph a line of regression.
3. Students will analyze their data and graphs and put what is happening between women and men, what year their times will meet, and the time they meet into a newspaper article.

#### Time

3 hours

#### Materials

Computer with Internet, Word, and Excel

#### Instructions

1. Students will collect men's and women's Olympic data from a web site stated in their worksheet.
2. They will then enter in the data into a table and graph the data using Excel.
3. A trend line (line of regression) will be made for both the women and men's Olympic times.
4. Where the trendlines cross will tell the students when men and women's times meet.

#### Evaluation/Assessment of Student's Competency

Use the rubric "Rubric for Olympics"

#### Closure

They will then write a newspaper article in Word discussing what happened over the years for both men and women, and discuss the slope and y-intercept.

## Section Two: Excel in Math

### ALT Three: Allowance

#### Summary

Students will learn about exponential growth verses linear growth using a spreadsheet.

#### Competencies

1. Students will learn how to enter formulas into Excel to answer the question, “who makes more money.”
2. Students will understand the differences between exponential and linear growth.

#### Time

2 hours

#### Materials

Computer with Excel

#### Instructions

Ask students which plan is better: receiving \$1,000,000 a day for 30 days OR \$1.00 a day and have it doubled each day for 30 days. Then have student open Excel and tell them they will need 3 columns 1) day 2) 1,000,000 a day plan 3) \$1.00 doubled each day plan. Students will then fill in 30 days for the first column, and for the remaining 2 columns come up with an equation that fits the given situation. At the end of this task, have students find the sum of each plan. After data is finished, discuss the difference between the plans, and the correlation of linear verses exponential growth.

#### Evaluation/Assessment of Student’s Competency

Have students print out their spreadsheet with formulas by pressing **Ctrl** and ~ key. By doing this I will have an understanding as to if the student understood how to enter in formulas.

#### Handout

No Handout Needed but the answer sheet is provided and called “Allowance”.

## Section Three: Mapping Out Your Life

### ALT One: Finances

#### Summary

Students will learn about variable and fixed expenses, and how they are related to a yearly budget.

#### Competencies

1. Students will learn the vocabulary variable and fixed expenditures
2. How to locate a career using various resources
3. How to find the cost of housing, utilities cost of purchasing and maintaining a vehicle, food, and entertainment.
4. Learn how to create a budget.

#### Time

3 hours

#### Materials

Computer with Internet and Excel  
Apartment and Auto guides

#### Instructions

1. Have students take a career interest survey provided by the school counselor or using <http://www.edonline.com/collegecompass/carhlp2.htm>
2. Take the results from the career survey and find a salary from the website [www.salary.com](http://www.salary.com)
3. Enter in the Excel worksheet the salary of the job
4. Find information for an apartment as well as a vehicle and enter the data into the worksheet.
5. Have parents work with students to find other expenses such as housing, utilities, cost of purchasing and maintaining a vehicle, food, entertainment, and miscellaneous expenses.
6. Have students enter in their data into the “Financial” Excel Spreadsheet provided. (take a look at the printed worksheet at the end of this document)
7. Reflect on costs of expenses verses income and how it may affect their life.

### **Evaluation/Assessment of Student's Competency**

See rubric – “rubric for finance”

### **Closure**

If time permits have students present their findings including their career interest. Now that students have worked on the spreadsheet, have them pick apart how it was put together. In other words, talk about the formulas used to produce the spreadsheet.

## **Section Three: Mapping Out Your Life**

### **ALT Two: Anytown USA**

#### **Summary**

Students will learn how to read a map and use conversions, area and distance formulas

#### **Competencies**

1. Students will learn how to apply mathematical formulas to practical applications.
2. Students will learn how to use a map to determine distances, area and reconstruction costs of streets.

#### **Time**

1 hour

#### **Materials**

City of Centerville Map(s)  
Worksheet “Anytown USA”  
Engineering Scales or Rulers

#### **Instructions**

Have students break up into pairs, hand out the worksheets and have students follow the directions.

#### **Evaluation/Assessment of Student’s Competency**

Student papers will be turned in and graded.

#### **Closure**

Discuss the usefulness of maps and how they can be used in daily lives as well as usefulness of why math skills are important.

## Section Three: Mapping Out Your Life

### ALT Three: Road Trip

#### Summary

Students will figure the cost of a road trip using various websites and mathematical formulas.

#### Competencies

1. Students will learn how to create a budget for a road trip
2. Students will learn how to use [www maps.com](http://www.maps.com)
3. Students will learn how to add percentages for given variables.
4. Students will learn how to use . <http://travel.yahoo.com/>
5. Students will learn how to create a food budget

#### Time

2 hours

#### Materials

Computer with Internet  
Student Worksheet "Road Trip"

#### Instructions

Have students break up into pairs, log onto the computer and follow instructions on the worksheet.

#### Evaluation/Assessment of Student's Competency

Student papers will be turned in and graded.

#### Closure

If time permits have students present their findings. Have students reflect on costs of expenses verses the amount they originally started with.

## **Transfer Activity**

The transfer activity for this curriculum is to have speaker come in and tell students about how Excel helps them through the business day. We suggest a city manager or someone in the city manager office because we found that they can tie all of the ends together.

Things you would like the speaker to talk about

- Finances
- Streets, sewers and sidewalks
- Traffic lights
- Job skills
- Computer skills

## Appendix One: Excel in Your Life

### Back to Basics - Alt 1

Name: \_\_\_\_\_

#### Information

- 1) Gather the following information for **5-10 people** that you know:

First Name  
Last Name  
Street  
City  
State  
Zip Code  
Birthday (D/M/YR)  
Email Address  
IM name

#### Vocabulary

To introduce the basic information of Excel we first must learn some vocabulary.

- 2) Open an Excel Program. What you are working on is called a Book. The Book has a set of sheets that the program can run off of. If you look towards the bottom of the screen you can see sheets 1, 2, and 3. Describe what you see on the screen.
- 3) Left click on the A on the top. What happened?  
The letters on the top of the sheet represent columns.
- 4) Left click on a number on the left side. What happened?  
The numbers going down the sheet represent rows.
- 5) If you click on the boxes that are on the sheet what happens?  
This is called a cell; each cell has a unique placement like points on a graph. In a graph you would graph points (x, y), in an Excel program the cells are (letter, number) If you click on a couple of different boxes you should notice that the information above the sheet changes.

Now you know some of the basic vocabulary lets start inputting the information that you have collected.

## Back to Basics - Alt 1

Name: \_\_\_\_\_

### Data Input

To start the spreadsheet start naming the columns from A1 going to the right  
Last Name, First Name, Street, City, State, Zip Code, Birthday, E-mail, and IM name.

After you have named them; fill in the correct information under each heading for the people on your list.

In the end it may look like this:

Last Name	First Name	Street	City	State	Zip Code	Birthday	E-mail	IM Name
Smith	Barb	1232 Smith St.	Nowtown	NH	23489	5/9/72	barb.smith@nc	Barbs
Arby	Ben	143 Maple St.	Springfield	NC	23445	2/4/78	ben.arby@don	Barby
Somebody	Jane	123 Any St	Anytown	OH	19345	2/12/45	jane.somebody	Jabo
Smith	Bob	786 Smith St.	Nowtown	NH	23489	4/23/70	bob.smith@no	Bobs
Somebody	Joe	657 Any St	Anytown	OH	19345	1/14/59	joe.somebody	Jobody
Walter	Nick	23 Jordan Way	Shytown	IL	56345	9/27/56	nick.walter@yc	WaltN

As you can see from the example above you can not see all the information that you put in. You can adjust the width of the columns and the height of the rows. To do that you go to the column or row you want to adjust and right click. Go down the list that appears and select column width or row height. Type in a number, if it fits then go to the next part you want to adjust, or work with the adjustment till every thing fits.

### Sorting

The names and other information can now be used and sorted in many different ways. You may want to put the people in alphabetical order.

1. Highlight the last names of your people, but not the title. To highlight information left click and hold on the box you want to start with then drag down slowly till you hit the last cell you want to highlight. If you have done it correctly the cells will be darker. Go to the top click on the Sort button (it has an arrow next to the letters A & Z pointing down).

#### **What happened?**

After you have put down your observations, **undo** what you have just done.

2. Highlight all the information, from the last names to the right, but not the titles, for all of your people. Now hit the sort button.

#### **What happened differently this time?**

3. Highlight all the information again and go to **Data** in the toolbar and select **Sort**. Sort by the birthday of your people. Did your order change? After your observations put the people in order by last name.

## Back to Basics - Alt 1

Name: \_\_\_\_\_

### Copy and Paste

Under your original list make a list with just the first names and birth days. Now you could just type in that information but there is an easier way.

1. Highlight the first names of your people, right click and select copy. What happened?
2. Select the same amount of rows below all of your information and press enter. What appeared?

Do the same for the date of birth.

What you just did was copied information from one spot and pasted it to another.

### Final Touches

If you printed up your list right now it would look very boring. We can fix that by adding a couple of extras.

- 1.) Let's insert a picture. Go to the tool bar on the top of the screen. Select **Insert** then **Picture** then **Clip Art**. Select a picture that you want to add and click on it.
- 2.) Select Row 1 and right click from the list select Format Cells. Work with the tabs that are labeled Alignment, Font, and Boarder. You can do a lot to the cells so explore and find something you like. You may have to adjust your rows and columns.

### Last Thoughts

Before you finish up and print it, make sure you print preview and check to make sure that it fits on one page and you have your name on it somewhere. Also save your address sheet on a disk that you have.

- 1.) How might you use this information? Both the program and the information that you collected.
- 2.) What is the thing you liked most about the project? Least? Why?

## You Say It's Your Birthday – Alt2

Name: \_\_\_\_\_

### Introduction

With all the information in your address book there are other ways and other things you can do to the information. Today we are going to take the Birthday information and find out how old in years and days your people are. Along the way you will learn more vocabulary and how to work with all the cursors that you see.

### Birthdays

1. First you are going to want to get your address book on your computer screen. If you followed the directions from the first Alt. you have your people's first names and their Birthdays in a little table below the Address information. Copy and Paste that small Table to sheet #2.
2. Now that you have that information on the second sheet, take the time now to rename the sheets that you have worked with. Rename a sheet by going down to where it says Sheet1, right click then select rename. Type in the new name. Do the same for the other sheet.
3. Today we are going to make use of functions in the Excel program. Functions are operations that the computer can do automatically. As an example, go below the names and birthdays you have and come up with a list of about 5 numbers in one column. Go to the cell under the last number select it. Go to the menu on top and select **Insert**, then **functions**. On the left side there are function categories, on the right side there are function names. On the left side go down to **Math&Trig**; on the right side go to **Sum**. What do you think this function is going to do?
4. After you have thought about it press ok and press ok again. Did it do what you thought it would? Change the numbers that you started with. What happens?
5. Now you have an idea on what functions are all about now we can work with the birthday information. We are going to insert the last names of the people in the second sheet. On the second sheet highlight all of column A. Right click and select insert. A new column A should appear. New columns always show up on the left side of the column that is highlighted. If you ever wanted to insert a row the new row would always appear below. In the new column copy and paste the last names of the people on your list.
6. The columns should be labeled from left to right: Last Name, First Name, Birthday, Current Day, Data#1, Data#2, Days, Year & Day.

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**You Say It's Your Birthday – Alt2**

Name: \_\_\_\_\_

- 1.) The first three columns should be filled in already. Under the column Current Day type an equal sign then the word today then an open parenthesis, press enter. What happened?
- 2.) When a cell is being worked in it has a dark ring around it. Slowly take your mouse around the box and you will see several different cursors show up. One will be a fat plus sign; this can be used to highlight areas and select cells. There is a skinny plus sign also. This symbol is to copy information from one cell to the others. Get the skinny plus sign and click and drag the information down the column till you hit your last person.
- 3.) The next column (Data #1) will be another function. This function is the first step to find out how many days you person has been alive and a calculation on exactly how old that person is. Go to the cell under Data #1. Go to Insert and then Function. Category: Data & Time, Function name: Days360, click ok. What does this function do?
- 4.) You are now given a function work sheet. Move the worksheet so you can see your information. In the start day click on the cell that has the first person birthday. The end date is going to be the current day so click on that. The end result is a number, using the information above, what does that number represent?
- 5.) Click and drag that function down the column. Who has the highest number?
- 6.) In Data #2 column you are going to write your first Equation. Equations start the same way as functions. Type an equal sign then click on the cell under Data #1. Then put the slash and the number 365. What operation did you just do?
- 7.) Click and drag the equation down the column. You should have a column with numbers in decimal form. Right click on the column letter and choose format cells, change the format from normal to fractions with three digits. What does this column represent?
- 8.) The next column is a fix of the information that we have already calculated. This cell under Days Alive is going to be two functions linked by an addition sign. The first function that you are going to need is under Math & Trig. Called INT. When you press ok it will ask you for a cell, choose the one that is under the heading Data #2. Press enter. What does this function do?

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**You Say It's Your Birthday – Alt2**

Name: \_\_\_\_\_

- 9.) Still under Days Alive the same cell as before we will now multiply that number by 5 using the \* sign and parentheses around the whole thing. It should look like this:  
 $=(\text{INT}(\text{F2}) * 5)$ .
- 10.) Same cell now you are going to take all of this information and add it to the Data #1. Same thing as before except with an addition sign.
- 11.) Same cell still and last part for this cell. Place an addition sign after everything and then insert a Function: category, Logical: name, IF. Click ok. In the first line put  $\text{F2} < (72/73)$  on the second line put 0 and on the third line put 5. What the computer is doing in this function is saying that if the person you know is less then one year old then you have to add 5 more days. In the end your equation under Days Alive should look like this:  $=(((\text{INT}(\text{F2})) * 5) + \text{E2}) + \text{IF}(\text{F2} < (72/73), 0, 5)$
- 12.) You have now calculated the days alive. How are you going to calculate the last column? If you need a hint look at direction #11. Same process.
- 13.) Test your information that you created today extend all the equations down a couple of lines test to make sure that someone who was born ten years ago has been alive 3650 days and is ten years old. If numbers don't match up you might have to look over your equations.
- 14.) Save all the work you have done today on your disk and print your birthday/days alive sheet and hand it in.

**Conclusion:**

What is a function in your own words?

What did you like about this project today?

What didn't you like?

**GPA and You - Alt 3**

Name \_\_\_\_\_

**Introduction**

With all the information that you have learned about Excel and picked up along the way this last project is one that you are going to come up with.

The Project is about your Grade Point Average (GPA).

You are going to come up with an Excel spreadsheet that can calculate your GPA at any time during your high school career.

Here are a couple of things that must be included.

1. All four years must be started and clearly marked. That is all four years are there in the beginning ready to be calculated.
2. Your GPA must be the same as the school's. Some schools have a 4.0 point system while others have a 5.0 point system.
3. You must use equations or functions to compute your GPA.
4. It must be aesthetically appealing, something that you want to keep up with.
5. It must be able to show year to year GPA and Overall GPA. (Ex. Even if your get all A's freshmen year your overall GPA will only be about 1.0 because you have only completed  $\frac{1}{4}$  of your High School years.)

Extra Credit – You can present your project to the class

**Making A Spreadsheet: GPA**

Teacher name: \_\_\_\_\_

Student Name \_\_\_\_\_

CATEGORY	4	3	2	1
<b>Years present</b>	All four	Three	Two	One or none
<b>GPA- Same as School</b>	Yes			No
<b>Equations and Functions</b>	Both equations and functions are used to calculate the GPA	Equations or functions are used to calculate.	Equations or functions are used to calculate.	No equations or functions are present.
<b>Attractiveness</b>	The spreadsheet is exceptionally attractive in terms of design, layout, and neatness.	The spreadsheet is attractive in terms of design, layout and neatness.	The spreadsheet is acceptably attractive though it may be a bit messy.	The spreadsheet is distractingly messy or very poorly designed. It is not attractive.
<b>Accuracy</b>	It can accurately calculate both year gpa and overall gpa.	It can accurately calculate year gpa or overall gpa.	It can calculate both year gpa and overall gpa. Errors in calculations.	Neither year nor overall gpa are calculated correctly.

## Appendix Two: Excel in Math

### Then, Now and Later – Alt 1

Name \_\_\_\_\_

Directions: For each item come up with a slope, y-intercept, and the equation of the line. Enter the equation of the line into a spreadsheet and estimate the cost of each item in 1980.

- 1) Eggs cost \$.14 for a dozen of eggs in 1903  
Eggs cost \$.99 for a dozen of eggs in 2003
  
- 2) Sugar costs \$.40 a lb in 2003  
Sugar costs \$.04 a lb in 1903
  
- 3) Coffee costs \$3.30 for lb.  
Coffee costs \$.15 for a lb.
  
- 4) Gas prices in 1968 costs \$.29  
Gas price in 2003 costs \$1.45
  
- 5) Tickets for a Georgia basketball game costs \$15 in 2002  
Tickets for a Georgia basketball game costs \$12 in 2001
  
- 6) Tennessee lowered its prices from \$12 in 2002 to \$8 in 2001

## Olympic Data – Alt 2

Name \_\_\_\_\_

To make a graph for your project, follow the order below.

- 1) Enter in your data into the Excel spread sheet like so, but use your data and not mine from below.

Year	Long Jump	
	Men's	Women's
1968	8.9	6.82
1972	8.24	6.78
1976	8.35	6.72
1980	8.54	7.06
1984	8.54	6.96
1988	8.72	7.4
1992	8.67	7.14
1996	8.5	7.12
2000	8.55	6.99

- 2) Highlight the chart by dragging your mouse over the year, men's, and women's columns. Make sure all of the data is selected.
- 3) Click on the insert menu and then click Chart
- 4) In the Chart Wizard go to XY Scatter Plot and then hit next
- 5) You will see a picture of your graph (do not change anything just hit "next")
- 6) In Chart Wizard "step 3 of 4" Put in your chart title of the graph that you are going to display (Example: Men's 400 Meter Freestyle), then label your x and y axis (which is the Value X- Axis and Y- Axis) and then hit next
- 7) Then hit "Finish"
- 8) To put in a line or regression or line of best fit, go to the chart menu and click on "Add Trendline"
- 9) Click on the "linear trendline" and hit ok

### To make an article in Word

- 1) Go to "New" in Word and go to the tab marked Pub
- 2) Follow the directions on how to make an article.
- 3) Keep your Excel spreadsheet open so that you can copy your graph to your article.

### Predicting the Future

Your project is to write a news article predicting the new record breaking time for an Olympic event. To write the article, you will use mathematical models to analyze past Olympic events from the website listed below.

<http://www.ex.ac.uk/cimt/data/olympics/olymindx.htm>

A completed project will include in a newspaper article a graph with a table of values used to make your prediction.

## Graphing: Olympic Records

Student Name \_\_\_\_\_

CATEGORY		4	3	2	1
<b>Data Table</b> 4 points		Data in the table is <b>well</b> organized, accurate, and easy to read.	Data in the table is organized, accurate, and easy to read.	Data in the table is accurate and easy to read.	Data in the table is not accurate and/or cannot be read.
<b>Labeling of axis and Title</b> 4 points		The X & Y axis has a clear, neat label that describes the units and the variables. A title was given.	The X & Y axis has a clear label that describes the units and the variables. A title was given.	The X & Y axis has a label, and a title was given.	The X & Y axis is not labeled and the title was not given.
<b>Accuracy of Plot</b> 8 points		All points are plotted correctly and are easy to see. A trendline is used in both sets of data.	All points are plotted correctly and are easy to see. A trendline is used in both sets of data.	All points are plotted correctly. A trendline was not used.	Points are not plotted correctly OR extra points were included.
<b>Units</b> 4 points		All units are described (in a key or with labels) and are appropriately sized for the data set.	Most units are described (in a key or with labels) and are appropriately sized for the data set.	All units are described (in a key or with labels) but are not appropriately sized for the data set.	Units are neither described NOR appropriately sized for the data set.
<b>Content</b> 8 points		A line of best fit was drawn, and with 2 points was able to come up with the equation of both lines.	The 2 points picked were not exactly on the line chosen, therefore having an inaccurate equation.	2 points were chosen, but were not close to being on the line.	An equation of a line was not given.
<b>Solving the system of equations</b> 8 points		Used the 2 equations and could find the year where the men met the women.	Used the 2 equations and could find the year where the men met the women, but doesn't match up with the graph.		Did not solve to see when the women and men would meet.
<b>Article</b> 12 points		The article showed an understanding of what was happening in the graph and table.	The article showed somewhat of an understanding of what was happening in the graph and table.	Understanding of what is happening in the graph is minimal.	No understanding of the table and graph.
<b>Creativity and Use of the Computer</b> 8 points		The project has a nice appearance and shows a <b>great</b> understanding of Excel and Word.	The project has a nice appearance and shows an understanding of Excel and Word.	The project has a nice appearance but shows a lack of understanding of Excel and Word.	The project has a nice appearance but shows no understanding of Excel and Word.

**Allowance – Alt 3**

Name \_\_\_\_\_

<b>Allowance</b>		
Day	\$1 a day doubled for a month	\$1,000,000 a day for a month
1	1	1,000,000
2	2	2,000,000
3	4	3,000,000
4	8	4,000,000
5	16	5,000,000
6	32	6,000,000
7	64	7,000,000
8	128	8,000,000
9	256	9,000,000
10	512	10,000,000
11	1,024	11,000,000
12	2,048	12,000,000
13	4,096	13,000,000
14	8,192	14,000,000
15	16,384	15,000,000
16	32,768	16,000,000
17	65,536	17,000,000
18	131,072	18,000,000
19	262,144	19,000,000
20	524,288	20,000,000
21	1,048,576	21,000,000
22	2,097,152	22,000,000
23	4,194,304	23,000,000
24	8,388,608	24,000,000
25	16,777,216	25,000,000
26	33,554,432	26,000,000
27	67,108,864	27,000,000
28	134,217,728	28,000,000
29	268,435,456	29,000,000
30	536,870,912	30,000,000
Sum	1,073,741,823	465,000,000

## Appendix Three: Mapping Out your Life

### Rubric for Finances

	0 Points	1 Point	2 Points	3 Points	Score
<b>Career Survey</b>	Student did not take the survey	Student did very little of the survey	Student completed a majority of the survey	Student completed the survey	
<b>Research</b>	Student did not do any research for the activity	Student did very little research for the activity	Student spent a majority of the time researching for the activity	Student did a very thorough research for the activity	
<b>Homework</b>	Student did not bring in any of the required information	Student brought in a small portion of the required information	Student brought in a majority of the required information	Student brought in all required information	
<b>Classroom Discussion</b>	Student did not participate in the classroom discussion	Student participated very little in the classroom discussion	Student participated a majority of the time during the classroom discussion	Student was actively involved in all of the classroom discussion	
				Total Points	

**Anytown USA – Alt 3**

Name \_\_\_\_\_

Directions: Please read carefully over the questions and make certain you label correctly. (At the bottom of this page there is some information that will be helpful.)

1) We want to reconstruct Nutt Road from S. Main St.(State Rt. 48) to Clio. Currently Nutt Road is a 2 lane road and we want to widen it to 3 lanes. How many sq. yards of pavement will we need for all 3 lanes?

2) We want to reconstruct Siena Street between Saddlewood Ave. and Brookway Rd. How many sq. yards of pavement will we need?

3) Measure Zengel Dr. from North Main Street to Alston Woods Ct. How many people would we need lying head to toe to cover the length of this road, if we know that an average person is 5 ft 6 inches tall.

4) Locate and measure how many square miles Oak Grove Park is. Hint: Take the longest side when measuring the area. Round each side to the nearest quarter mile.

5) E. Alexandersville-Bellbrook Rd was recently reconstructed between Loop Rd. and Bigger Rd. This road is now a 4-Lane road with turning lanes. How many sq. yards of pavement was needed to complete this project?

6) Chris is wanting to train for a marathon. If Chris starts at the intersection of Cable Ct. and Maltbie Rd. and proceeds in a clockwise rotation, eventually turning into Slagle and back into Maltbie Rd. Approximately how many miles would he go if he traveled this loop 5 times?

#### Things you need to know

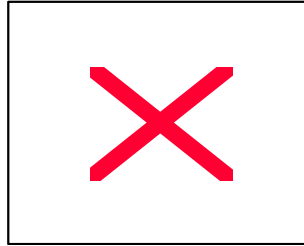
Residential and 2-Lane Roads – 28 ft wide  
 3-Lane Roads = 41ft wide.  
 4-Lane Road with turning lanes = 64ft. wide

1 mile =5280 ft.

**Road Trip – Alt 3**

Name \_\_\_\_\_

<b>Name:</b> _____ _____
-----------------------------

**Road Trip**

You and a friend saved up money for a road trip during Spring Break (1 week) you have \$400.00 each to spend on everything ranging from gas to food. First you and a friend are going to pick a vacation spot that is out of state. It can be close or far away, but realize you are going to drive to your vacation spot so it has to be in the US.

1) Our vacation spot is \_\_\_\_\_.

- Now go to the web site [www.maps.com](http://www.maps.com)
- On this site you are to go to the **Get Directions** link. It is located on the right hand side.
- You should click on **Driving Directions**. You will see Start of Route, then click on **Enter Address**. You will then see Street Address. Do NOT fill this in. You will need to fill out the city and the state and then click **Set Start Address**. Go to End of Route and click on **Enter Address**. Enter only in the city and state and then click on **End Route**. Lastly you will go to **Plan Route**.

a) What is the **total distance** from your starting to ending point? \_\_\_\_\_

b) Estimate the distance to the nearest 100 miles \_\_\_\_\_  
 Example: If your distance is 237 miles you would round to 200 miles, but if it was 254 then round up to 300.

Add an additional 15 miles for every 200 miles, onto your total distance for detours or places to get gas. Set this up as a ratio below

$$\frac{15 \text{ miles}}{200 \text{ miles}} \quad \frac{\quad \text{miles}}{\quad \text{miles}}$$

- b) What is the **total distance** from your starting to ending point **after** the 15 miles for every 200 miles? \_\_\_\_\_
- 2) What is the **estimated time** (round to the nearest hour) from your starting to ending point? \_\_\_\_\_
- 3) Add an additional 30 minutes for every 3 hours on the road to switch drivers, eat, or get gas. Write as a ratio
- |                   |                         |
|-------------------|-------------------------|
| <u>30 minutes</u> | _____                   |
| 3 hours           | <u>minutes</u><br>hours |

b) What is the **estimated time** from your starting to ending point **after** the additional 30 minutes for every 3 hours? \_\_\_\_\_

4) Gas cost \$1.40 per/gallon. Your car gets 20 miles/gallon. How many miles are you traveling (\*remember to include both ways)\_\_\_\_\_miles. What is your total cost for gas for the whole trip? \$\_\_\_\_\_

5) You need to find a place to stay while on your trip. Go to the site <http://travel.yahoo.com/>

- Click on the hotel icon.
- Put in only the following information
  - 1) First click the 2<sup>nd</sup> button (Search by city, zip or address)
  - 2) Enter in the City and State (NOTHING ELSE!!!)
  - 3) Scroll to the bottom of the page and click the "Show me Hotels"
  - 4) A list of hotel will show up and the price for one night will be on the right hand side.

\* How much are you spending on a hotel for a day? \_\_\_\_\_? How much are you spending on a hotel for a week? \_\_\_\_\_?

6) You also need to eat. How much do you spend for:  
 Cost for breakfast for one day? \$\_\_\_\_\_

What did you eat? \_\_\_\_\_

Cost for lunch for one day? \$\_\_\_\_\_

What did you eat? \_\_\_\_\_

Dinner for one day? \$\_\_\_\_\_

What did you eat? \_\_\_\_\_

Total cost for food for 1 day is? \$ \_\_\_\_\_  
 for a week? \$ \_\_\_\_\_

Name: \_\_\_\_\_

Total Gas Costs	\$ .
Total Hotel Costs	\$ .
Total Food Costs	\$ .
<b>Total</b>	
You have \$800.00 did you exceed your limit?	<b>Yes</b> or <b>No</b>
How much money do you and your partner have left over for fun things like concerts, shopping, and tourist sites?	\$ _____ . _____

Questions:

1) What problem was the hardest?

2) What did you learn?

3) What would you change?

Subject	Credit	Grade	GPA Points
Math	1	A	4
Science	1	A	4
English	1	A	4
S.S.	1	A	4
Foren Language	1	A	4
Gym	0.5	A	2
Health	0.5	A	2

GPA Year 4  
Over All GPA 1

Subject	Credit	Grade	GPA Points
Math	1		0
Science	1		0
English	1		0
S.S.	1		0
Foren Language	1		0
Gym	0.5		0
Health	0.5		0

GPA Year 0  
Over All GPA 1

Subject	Credit	Grade	GPA Points
Math	1		0
Science	1		0
English	1		0
S.S.	1		0
Foren Language	1		0
Gym	0.5		0
Health	0.5		0

GPA Year 0  
Over All GPA 1

Subject	Credit	Grade	GPA Points
Math	1		0
Science	1		0
English	1		0
S.S.	1		0
Foren Language	1		0
Gym	0.5		0
Health	0.5		0

GPA Year 0  
Over All GPA 1

<b>CASH FLOW STATEMENT</b>
----------------------------

<b>MONTHLY INCOME</b>	
-----------------------	--

ENTER IN SALARY	
AMOUNT TAKEN OUT FOR TAXES	0
TOTAL AFTER TAXES	0
MONTHLY INCOME	0

<b>MONTHLY FIXED EXPENSES</b>	
-------------------------------	--

MORTGAGE OR RENT	
AUTO LOANS	
INSURANCE	
EDUCATIONAL LOANS	
SAVINGS AND INVESTMENTS	
OTHER	
TOTAL	0

<b>MONTHLY VARIABLE EXPENSES</b>	
----------------------------------	--

FOOD	
TRANSPORTATION (GAS AND MAINTENANCE)	
MEDICAL/DENTAL CARE	
UTILITIES (PHONE, ELECTRIC, GAS)	
CHILD CARE	
CREDIT CARDS	
CHARGE ACCOUNTS	
ENTERTAINMENT	
CLOTHING	
MISCELLANEOUS	
TOTAL	0
GRAND TOTAL	0

<b>TAXES</b>	<b>0</b>
<b>FIXED EXPENSES</b>	<b>0</b>
<b>VARIABLE EXPENSES</b>	<b>0</b>
<b>LEFT OVER</b>	<b>0</b>