

☺ *Sunshine...on my shoulder...makes me happy* ☺

READ FIRST --- THEN DO --- READ FIRST --- THEN DO

Name _____ Date _____ Period _____

Most of us like sunshine. Summers in Alaska are nice because there is lots and lots of sunlight. You can skateboard or rollerblade late into the evening and enjoy the cooler nighttime temperatures.

Winters in Alaska are hard on some people. Some people get depressed (*S.A.D - seasonal affective disorder*) because there is so little sunlight. It is dark when you go to school and almost dark when you get home. In some places like Barrow they go for months without seeing the sun. Some people get so depressed that they buy really bright lights for their houses. This fakes their brain into thinking it is getting more sunlight.

QUESTION???? Does everyone in the world get the same amount of daily sunlight that we do?

You are going to help make a graph that compares the amount of sunlight in different places around the world throughout the year.

But to do this you must follow all of these steps very carefully!!! If you get stuck read it again and look at the example. Then ask a neighbor for help. As a last resort ask the teacher.

1. Pick a city that you want to investigate. Pick something exotic. Something foreign. Something in the far north or far south or near the equator. Look in an atlas or on a globe to get some ideas. Please do NOT pick Juneau, Alaska.

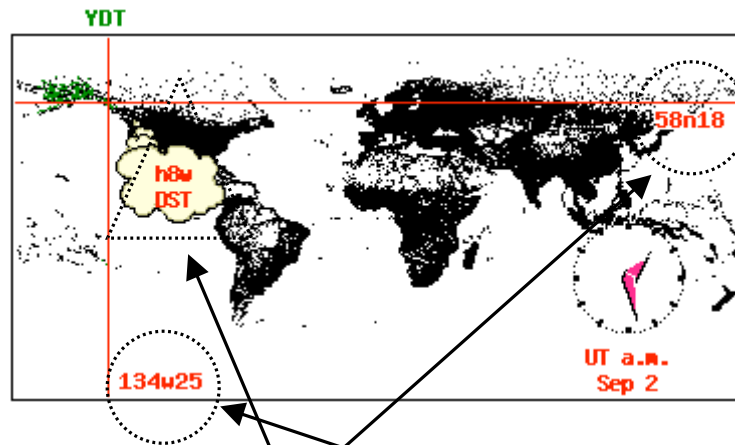
What city do you want to investigate? _____
What country is it in? _____

2. Check with the teacher to see if that city has already been taken. Each person must do a different city. If yours has already been taken choose another.

3. Next we must determine where in the world your city is located. The earth is separated in regions – north or south of the Equator and east or west of the Prime Meridian.

Go to the Technology Class Homepage (www.jsd.k12.ak.us/~degeners), click on the 7th grade class area, and under the heading Excel Project click on the word: ATLAS QUERY (or go to www.astro.com/atlas).

Type in the name of your city in the box where it says Birth Town and click SEARCH. If there is more than one city with that name choose the correct one.



To find the location of your town look at the circled numbers in the map above. In this case we would say that Juneau is North 58 degrees 18 minutes and West 134 degrees 25 minutes

Where is your city? _____

Sample: South 13 degrees 30 minutes and East 115 Degrees 05 minutes

Another important piece of information is how far your city is away from Greenwich Mean Time (GMT). Greenwich, England has been the home of Greenwich Mean Time since 1884 when representatives from 25 nations met in Washington, DC to decide where to locate it. Greenwich defines both time and place for the whole world. All time is measured relative to Greenwich Mean Time (GMT) and all places have a latitude (their distance North or South of the Equator) and a longitude (their distance East or West of the Greenwich Meridian) Look at the triangle in the map above. This tells us that Juneau is 8 hours West of GMT. DST stands for Daylight Savings Time.

How about your city? _____

Sample: Madrid is 1 hour East of GMT

4. Now we need to find out the sunrise and sunset of your city. Go back to the Technology Class Homepage and click on the word: Sun or Moon Rise Table (or go to http://aa.usno.navy.mil/data/docs/RS_OneYear.html).

Scroll down to FORM B and enter in the correct information in the blanks. Enter in the current year and the table type should be "sunrise/sunset". Click "Computer Table" when finished.

5. You will see a table that has all of the sunrise and sunset times for your city. Note that they are in military time – not standard time. Military or Universal time is easy to understand after a little practice. There is no AM or PM, the day is divided into 24 hour segments. The simplest and quickest way to calculate military time when you are just learning it is to understand that all numbers higher than 1200 constitute PM. So the next time you are watching a movie and a soldier says its "2235" hours use simple subtraction to find civilian time: 2235 - 1200 = 10:35 PM **Remember – keep the time in military or universal time – do NOT convert it to civilian time. Click PRINT to print out this table.

It would be too much work to check every single day of the year so we will only check once a month. We are going to use the 21st day of every month for this experiment. Why the 21st day? You will find out later.

6. Open up a new Microsoft Excel file. Put your name in cell A1 and class period in cell C1. Then recreate the table you see below, but do not enter in your own data yet.

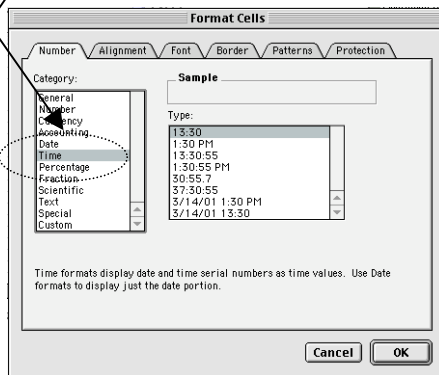
	A	B	C	D
1	Mrs. Degener		1st Period	
2				
3	Daylight Data for: Juneau, AK			
4	Day	Month	SUNRISE (hour and minutes)	SUNSET (hour and minutes)
5	21st	Jan		
6	21st	Feb		
7	21st	Mar		
8	21st	Apr		
9	21st	May		
10	21st	Jun		
11	21st	Jul		
12	21st	Aug		
13	21st	Sept		
14	21st	Oct		
15	21st	Nov		
16	21st	Dec		
17	21st	Example	8:32	19:43

How do I make Sunrise (hour and minutes) wrap around like that?? Maybe I should look at Step 11.

How come I have 0000 instead of a time? Maybe I should add a COLON to my times – that will fix the problem.

7. Before you enter your data make sure to format your cells first. Use the mouse to select the cells where the times will go. Go up to FORMAT, CELLS, and change the NUMBER type to TIME – example 13:30. Now you can enter in the times in the table.

	A	B	C	D
1	Mrs. Degener		1st Period	
2				
3	Daylight Data for: Juneau, AK			
4	Day	Month	SUNRISE (hour and minutes)	SUNSET (hour and minutes)
5	21st	Jan		
6	21st	Feb		
7	21st	Mar		
8	21st	Apr		
9	21st	May		
10	21st	Jun		
11	21st	Jul		
12	21st	Aug		
13	21st	Sept		
14	21st	Oct		
15	21st	Nov		
16	21st	Dec		
17				



8. Using the sunrise and sunset we can calculate the amount of daylight your city gets. Add a column E with a column title of “Amount of Daylight”. Use subtraction formulas to calculate the amount of sunlight. For Example in E5 you should have: =D5-C5 After you have typed in your formula in E5, you MUST press RETURN or you will have all sorts of problems. Now type in your formula in E6. Don’t forget to press RETURN when you are done.

E
Amount of Daylight
=D5-C5
=D6-C6
=D7-C7
=D8-C8
=D9-C9
=D10-C10
=D11-C11
=D12-C12
=D13-C13
=D14-C14
=D15-C15
=D16-C16

9. In the cell directly below the last column, calculate the average amount of daylight by using the formula: *=average(select cells you want to average)* Don't forget to press RETURN after you've typed in your formula. See the picture below for your formula.

Daylight Data for: Juneau, AK				
Day	Month	SUNRISE (hour and minutes)	SUNSET (hour and minutes)	Amount of Daylight
21st	Jan	9:24	16:55	7:31
21st	Feb	8:15	18:09	9:54
21st	Mar	6:57	19:14	12:17
21st	Apr	5:30	20:24	14:54
21st	May	4:20	21:30	17:10
21st	Jun	3:51	22:08	18:17
21st	Jul	4:27	21:40	17:13
21st	Aug	5:32	20:28	14:56
21st	Sept	6:40	19:00	12:20
21st	Oct	7:47	17:37	9:50
21st	Nov	8:59	16:27	7:28
21st	Dec	9:45	16:07	6:22
				=AVERAGE(E5:E16)

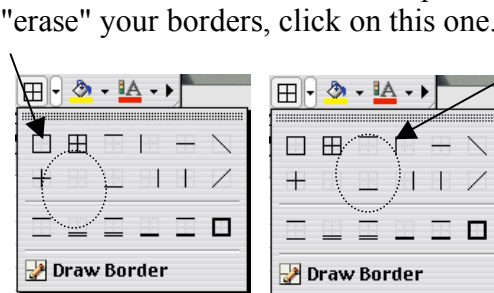
10. Now create attractive borders on your chart. There are two ways to do this.

The first way is to select the cells you want to work with and go to **FORMAT>CELLS>BORDERS** and then select the types of borders you want. You can even select the color. Then click **OK**.

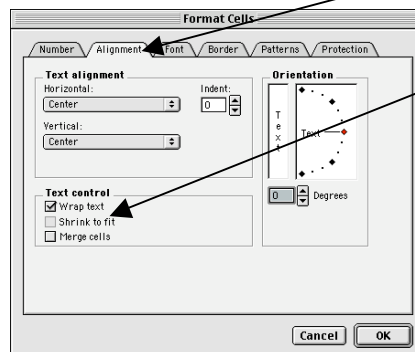
The other way to add borders is with the Border Shortcut Button. First, go to **View>Toolbars>Formatting** and make sure there is a checkmark next to the word **Formatting**. The formatting tools should be on your screen. Look for the **BORDERS** tool that looks like this:



Click on the black triangle to the right of the **BORDERS** tool and choose the option that will **UNDERLINE** your cell. If you make a mistake and need to "erase" your borders, click on this one.

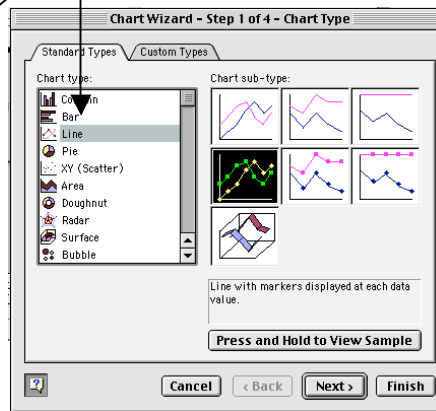


11. Format cells A4, B4, C4, D4, and E4 (the cells with the words Day, Month, SUNRISE, SUNSET, and Amount of Daylight). Highlight A4 to E4. Go to **FORMAT, CELLS** and then click on the **ALIGNMENT** tab, under **Text alignment** choose horizontal center, vertical center. Under **Text Control**, put a check mark in the box next to **Wrap text**. Click **ok**.

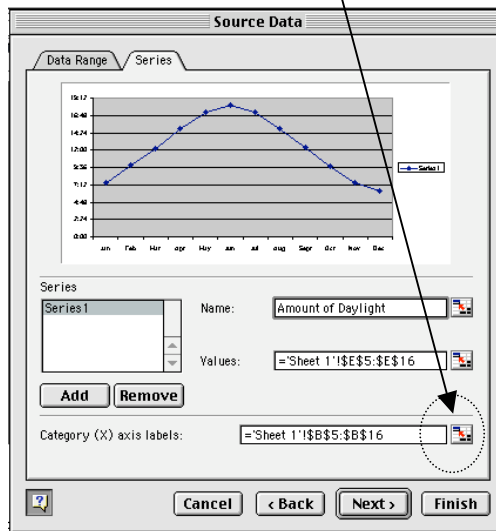


12. Next we will make a graph of this information. Select the cells that show the amount of daylight (BUT DO NOT SELECT THE AVERAGE) and click on INSERT – CHART. Select a line graph and pick a type that has “markers” (first one on second row). Click NEXT.

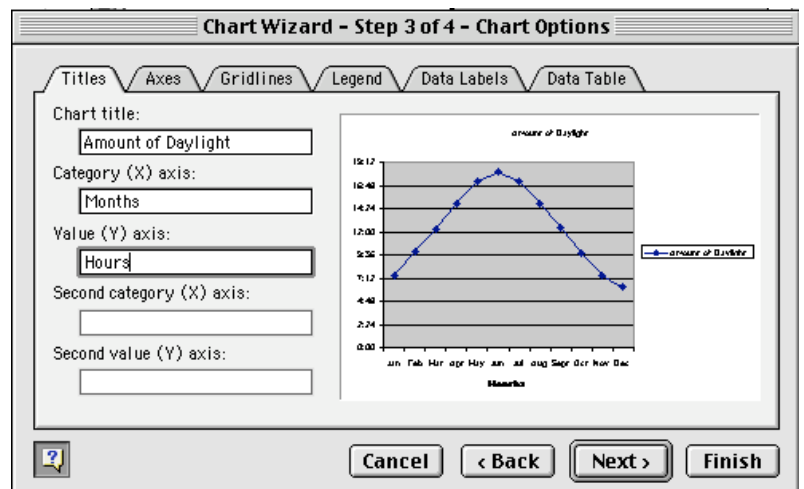
Daylight Data for: Juneau, AK				
Day	Month	SUNRISE (hour and minutes)	SUNSET (hour and minutes)	Amount of Daylight
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21st	Oct	7:47	17:37	9:50
21st	Nov	8:59	16:27	7:28
21st	Dec	9:45	16:07	6:22



13. Click on the upper tab “Series”. Select Series 1 and change the name to “Amount of Daylight” by typing this in the Name box. Click on the box next to “Category (x) axis labels”. Use the mouse to select the cells that contain the names of the months. Click NEXT.



14. Give the chart the following title: “Amount of Daylight for your city”. Category (x) axis should be “Months” and Value (y) axis should be “Hours”. Click NEXT.



15. Make sure the option “as object in” is selected. Click FINISH.

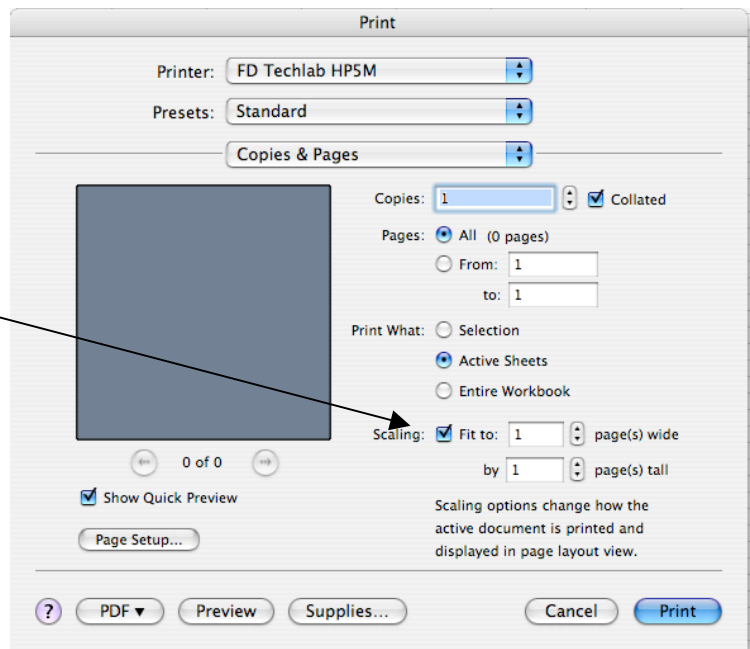


16. Position your graph exactly neatly beneath your data table.

17. To save paper and make it look nice we want everything to fit on one page. To print on ONE PAGE, go to: FILE – PRINT and click on SCALING: Fit to One Page. Print your project

18. Go to where the DAYLIGHT AROUND THE WORLD ASSESSMENT is posted in the classroom and double check your work. Check to make sure you will get a good grade before you hand in the two print outs.

19. Go up to the computer in the center of the classroom and enter in your city and amount of daylight for your city for each month. Your information should show up on the graph



20. Tear off the attached ASSEMENT and staple that on top of the printouts your printed worksheet (the original), and your printed worksheet (the one that will show your formulas). Put them in the assignment box. Make sure your name and your class period is on each paper.

DAYLIGHT ACROSS THE WORLD ASSESSMENT

Technology

Name _____ Period _____

Grade ____/100 points

_____/15 pts. You found the sunrise and sunset for your city and entered it into a chart in Excel.

_____/5 pts. Your chart has BORDERS around it.

_____/5 pts. You formatted the titles in row 4 to WRAP. You centered the titles horizontally and vertically.

_____/10 pts. You CORRECTLY calculated the amount of daylight on the 21st of each month. The amount of daylight should be recorded in column E.

You made a line graph of the amount of daylight of your city. Your line graph should have:

_____/5 pts. A title - “Amount of Daylight for ...*your city*...”

_____/5 pts. Series 1 should be named “Amount of Daylight”.

_____/5 pts. X axis should be labeled “Months” and have the months listed below each mark.

_____/5 pts. Y axis should be labeled “Hours” and should have the times listed next to each mark.

_____/20 pts. Your chart is made correctly.

_____/10 pts. You calculated the AVERAGE amount of daylight for your city for the year. The answer should be recorded in cell 17E.

_____/5 pts. You handed in TWO copies of your Excel project – one showing the formulas and one showing the answers. Each copy is printed on ONE page.

_____/ 10 pts. You worked quietly and were on task.