

InfoGraphics: Scientific Literacy For All



21st Century Fluency Skills

With computers and the myriad of technology that exists, it is becoming more imperative that we utilize as much as provided and even then some in the educational arena. Like textbooks, calculators, protractors and the wealth of other traditional tools, technology has moved to the forefront in so many areas of life, both personally and professionally. Using these 21st Century tools is still something we strive to work toward in schools. Not only do the tools change, but the expectations on our teachers and students beg for more advancement.

21st Century Fluency Skills encompass the gamut of technology tools that we use every day as well as the idea that creativity and invention can be taught. When we focus just on the practice of core standards, we miss out on the ability to see the product of our students understanding. Changing the paradigm from worksheet-based learning, even traditional lab exercise is difficult, but only at first.

Just like the tools mutate over time, we must make our delivery more pliable and accommodative to those changing tools. These InfoGraphics are just an example of the possibility of project-based, or performance event type learning and instruction. Their creation required a number of 21st Century Fluency Skills. It was a crash course for the students who completed this exercise, but they handled the process beautifully. Check out <http://www.21stcenturyfluency.com/> for more information on 21st Century skills. Enjoy!

Lesson Creators:

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Special Thanks to all of Rob's Chemistry classes. They were absolutely wonderful and were extremely engaged during this process.

8. The Arrange Menu option will allow students to change layers of objects on their graphic by putting items on top of each other. In our example we had students create a rounded rectangle object, change the color, fill it with a gradient and then send it to the back. Students resized it and changed the layer where it resides to enhance the professional look of their graphics.



For additional assistance we will provide a detailed video outlining the process and showing the steps to accomplish all of the involved objectives. We can generate QR codes that will link to the hosted video for users that have phones and QR code readers. Additionally we can provide the URL to the video for standard computers users.

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Goal:

To gain a working knowledge of iWork: Numbers, Pages and create simple InfoGraphics that relay real data that is student generated.

Abstract:

In this lesson the students will learn basic functions in iWork: Numbers by setting up a basic spreadsheet, filling it with a data set, and creating a function to get a product in the form of a percentage. They will then learn some of the basic abilities of Pages by inputting the product from the Numbers spreadsheet. They will learn some of the basic tools available to them through Pages by creating an InfoGraphic with the information generated in the Numbers spreadsheet.

Objectives:

- Students will gain basic knowledge of data collection
- Students will learn basic operations of spreadsheets in Apple's Numbers application
- Students will generate their own active spreadsheets using data they collect
- Students will acquire and demonstrate advanced online search methods
- Students will create their own learn intermediate functions of Apple's Pages application
- Students will collect graphics from the web
- Students will learn basic information about copyright
- Students will create their own InfoGraphic based on data they have collected

Procedure: Numbers

1. Have students power on cell phones and collect some information about the items they store on their phones. If they do not have cell phones they may use the data collected from a peer's phone or even another personal wireless device such as an iPod, tablet, organizer, Palm, etc. The data they will include are items such as applications, text messages, calls, music, videos, and photos.

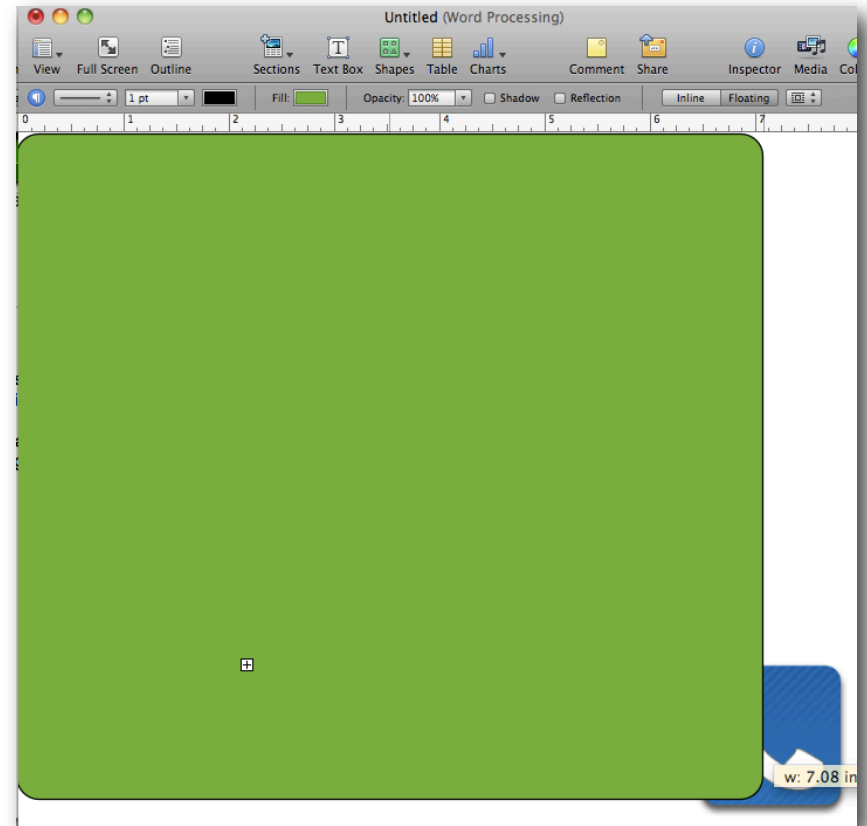


2. Students will open the Apple Numbers application (ideally a template will already be available on the computers via download from the teacher website, email, wiki, or serve). The template should include rows and columns like the example below. You may make your own, or to save time, you can download one we have created at: This part may take some time for students to accomplish, but don't allow too much time to finish this portion. We did this in whole lesson in 50 minutes and it takes the entire time.

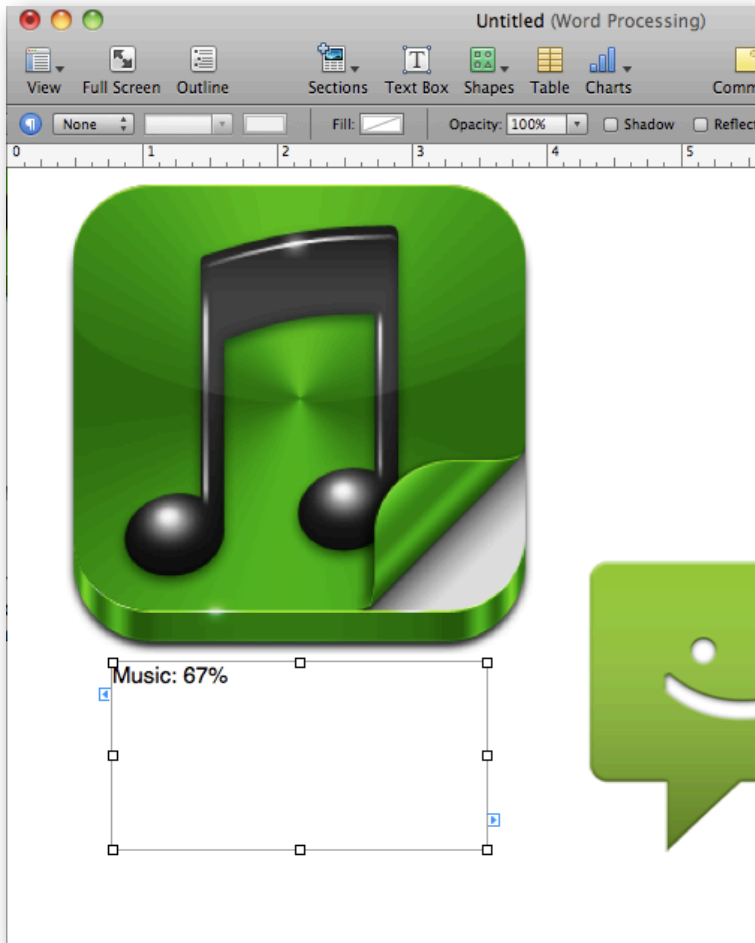


	A	B	C	D	E	F	G	H	I	
1										
2										
3				Student Cell Phone Data Set						
4		APPS	MUSIC	TEXTS	CALLS	PHOTOS	VIDEOS	TOTAL USAGE		
5	Your Phone									
6	% of total usage									
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										

7. Next create a shape, (the rounded rectangle). It will appear in the middle of the screen. Expand the box so that it fills the entire poster. Then use the Graphic Inspector window to change the object. We had students use the Grpahic Inspector to change the color, add a gradient fill, affect the angle of the gradient and make it more interesting. You may just want to have students play with the Graphics Inspector to see how they can cosmetically enhance their graphics. Let them explore.



6. Next students will create a text box for each item and type the name of the item followed by the percentage of space occupied on the device. The text box should be placed next to the corresponding icon (can be above, below or to either side of the icon).

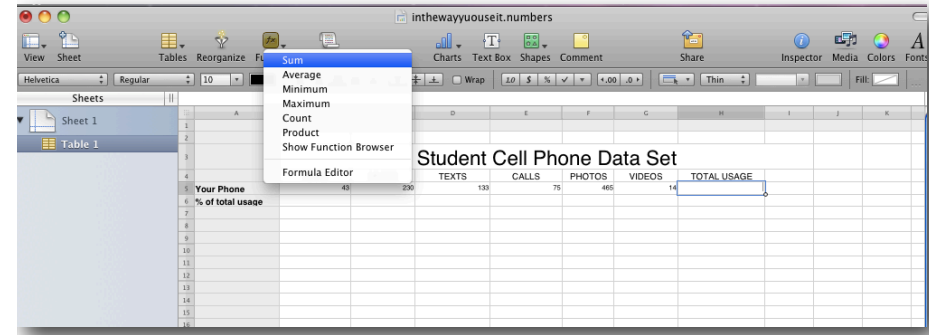


3. Students should do the best they can to tally the number of items listed in the spreadsheet and enter those values in the appropriately labeled spaces. If their devices do not include items in the spreadsheet, have students enter a value of zero. Their spreadsheets should look like the example below.

The image shows a spreadsheet titled "Student Cell Phone Data Set". The columns are labeled APPS, MUSIC, TEXTS, CALLS, PHOTOS, VIDEOS, and TOTAL USAGE. The rows are numbered 1 through 15. The data for "Your Phone" is as follows:

	APPS	MUSIC	TEXTS	CALLS	PHOTOS	VIDEOS	TOTAL USAGE
Your Phone	43	230	133	75	465	14	
% of total usage							

4. When students have entered in all values for their personal devices, then show them how to use the Functions menu to create a formula that will add the sum of all of the items they have on their devices. To do this, students will select just the cells that have data in them. For instance, in our example students would select cells B5-G5. H5 should be blank and when they click on the Function Menu Item, and select Sum, the Total Usage will fill in with the total of all items on their devices.



5. Lastly, students create a function that will figure the percentage of each item that occupies space on their phones. To do this students click in the first appropriate cell for % of Usage. In our example, the cells for percentage are B6-G6. Students will start by type the = sign in the space which will automatically start the function in cell B6. Then students will click on B5, type / and then click on H5. When they hit return it will fill in the percentage. If students click to highlight cell B6, click and drag to the right and stop at G6. The percentages will auto-fill.

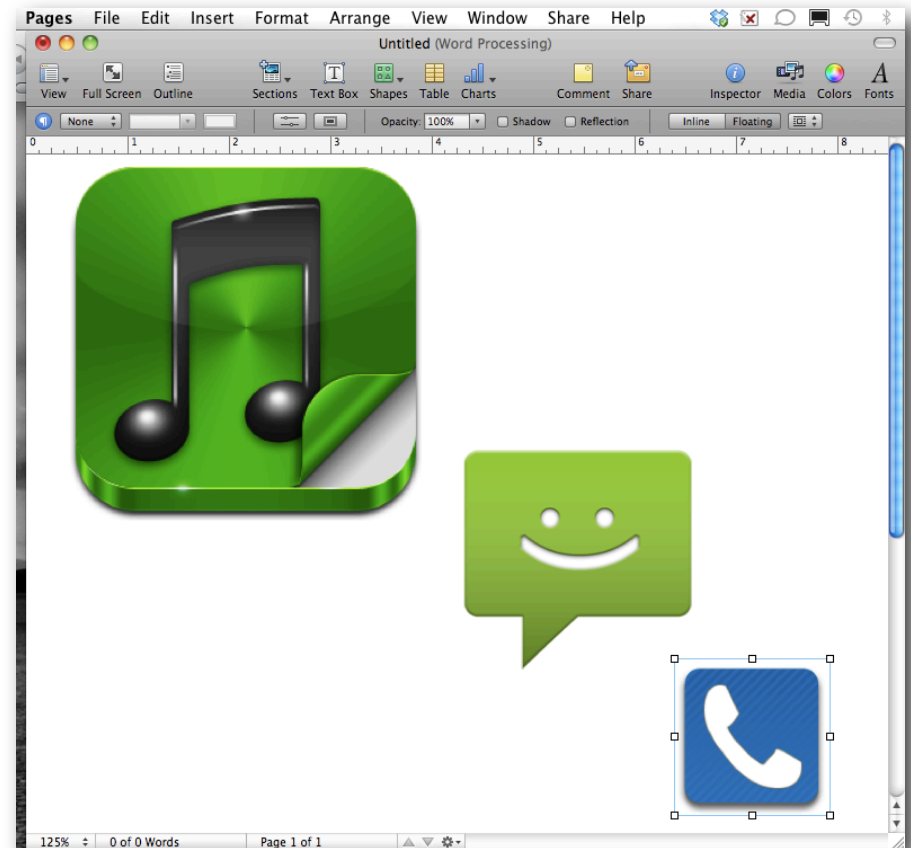
The screenshot shows a spreadsheet with the following data:

	APPS	MUSIC	TEXTS	CALLS	PHOTOS	VIDEOS	TOTAL USAGE
Your Phone	43	230	133	75	465	14	960
% of total usage	=B5/H5						

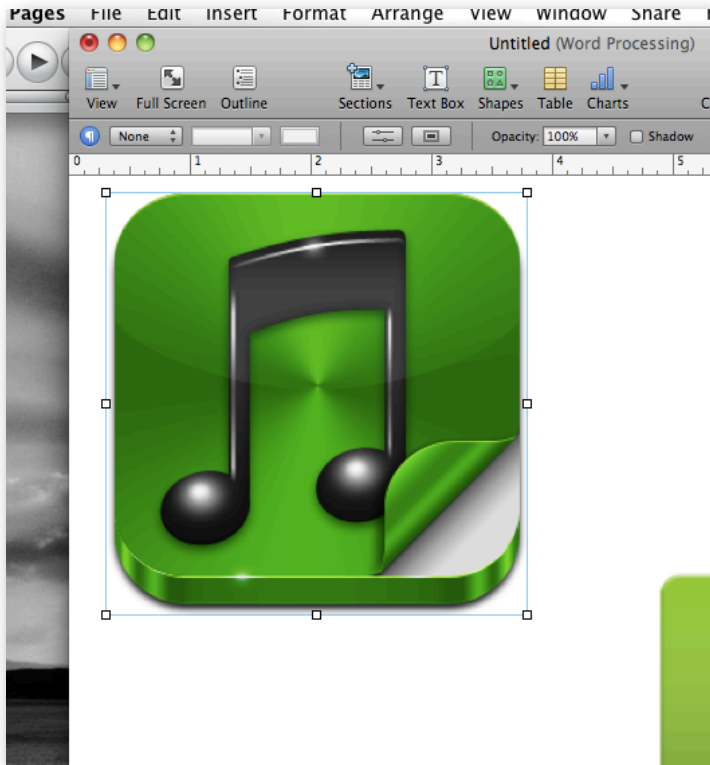
The screenshot shows the same spreadsheet with the following data:

	APPS	MUSIC	TEXTS	CALLS	PHOTOS	VIDEOS	TOTAL USAGE
Your Phone	43	230	133	75	465	14	960
% of total usage	4%	24%	14%	8%	48%	1%	

5. Since each icon is independently moveable, have students drag the icons and arrange them to reflect their percentage of usage on their devices. In our example, we had students place the icons with the least usage at the bottom right corner of the document and as the items gained more importance, they moved diagonally up to the left side of the document. See the illustration below. The idea is to illustrate with size and arrangement, which items on their phone occupy the most space and get the most usage.

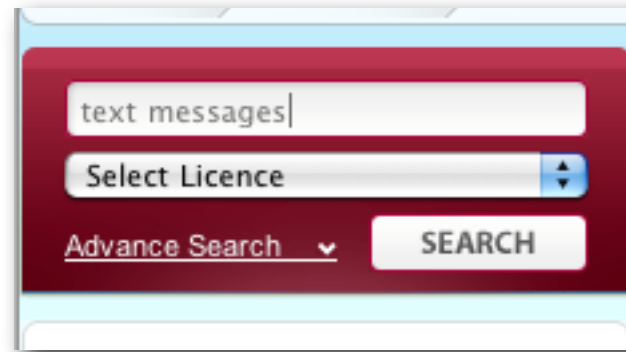


4. Next they will change the sizes of the icons to correspond to with the percentages (bigger for a larger percentage, smaller for a smaller percentages) with in reason. If the percentages are very small to nothing, have them still leave the icon big enough to understand. To do this, click on the item you wish to resize. Drag boxes will appear at each corner, top, bottom, left, and right. Click in any corner box and drag diagonally. The object will resize proportionately. If students use the drag boxes on the top, bottom and, sides, the icons will resize, but not proportionately.

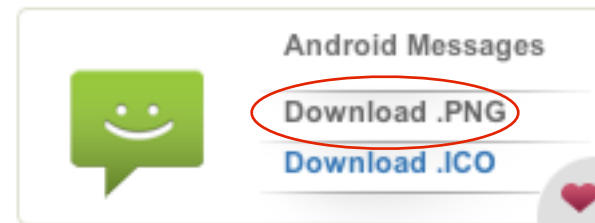


Procedure: The Web

1. Using the site <http://www.iconspedia.com>, students will search to find icons that represent the items they found on their phones. For each items, one icon will be represented. You may have to give them some searching pointers (e.g. text messaging is called SMS). Have them search for icons that are specific to the devices. It makes the experience more personal and fun. The students will find a wealth of icons in different formats, just make sure they use the .png formatted icon and click on the link when they find the icons they desire.

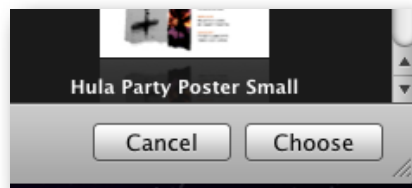
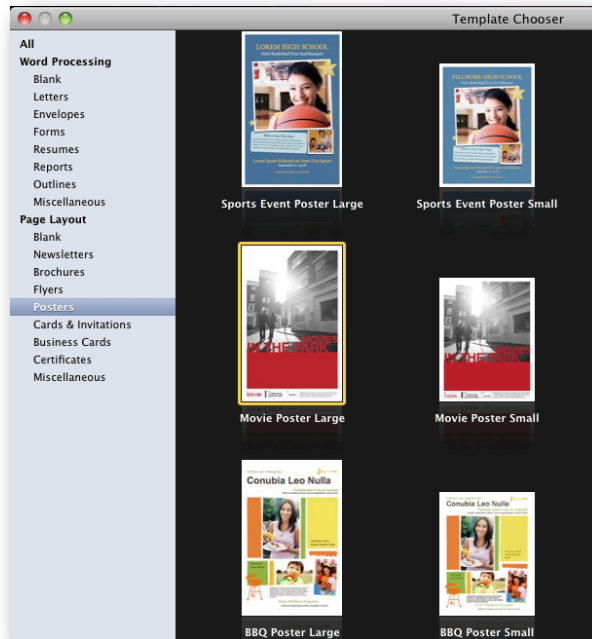


2. When students find icons that represent the required items (even if absent), make sure they select the .png version. These are higher quality and the backgrounds are translucent (this is important when creating their graphic). Have students leave their browser window open to iconspedia so that they can revisit when they start creating their graphics.

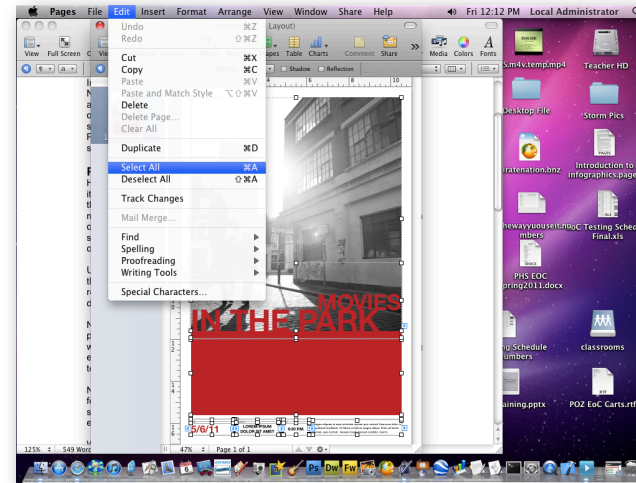


Procedure: Pages

1. Have students open the Pages application. It will open to the project gallery. To the left are template items in a list and to the right are the themed templates. Have students click on Posters on the left and select the Movie Poster Large item in the right window. Click Choose. You can just start a blank document if you like. The movie poster is larger and the finished product may look better printed if it is bigger. If these will just be displayed digitally, then you can certainly just choose a Letter-sized document.



2. To clear the document have students go to the Edit Menu in the menu bar, choose Select All and press the Delete Key. This will empty the page and make it ready for students to start creating.



3. Have students revisit iconspedia (their browser window should still be open). Students should position both the browser window and the window with the Pages document side-by-side so they can easily drag icons from the website to the page that will be their infographic.

