Do you have good hand-eye coordination?

Carrie Wiederholz
8th Grade – Algebra I
Scatter Plot Project

Target Audience

- Lewis F. Cole Middle School

  Fort Lee, NJ

- 8th Grade – Regular Algebra I Class
- About 24 students per class
- Class Length: 42 minutes
- Project Time Line: 4 days

Goals & Objectives

Students will be able to:

- Collect & Record Data on Excel Spreadsheet
- Analyze and Interpret the Data
- Create Scatterplot graphs of the data
- Find a line of best fit
- Make predictions based upon their line of best fit

NJCC Standards:

- S.ID.3 Interpret differences in shape, center, and spread in the contest of the data sets, accounting for possible effects of extreme data points (outliers)
- S.ID.6.c Fit a linear function for a scatterplot that suggests a linear association.
- 8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

Prior Knowledge: Scatterplot types and Writing Linear Equations

Activites:

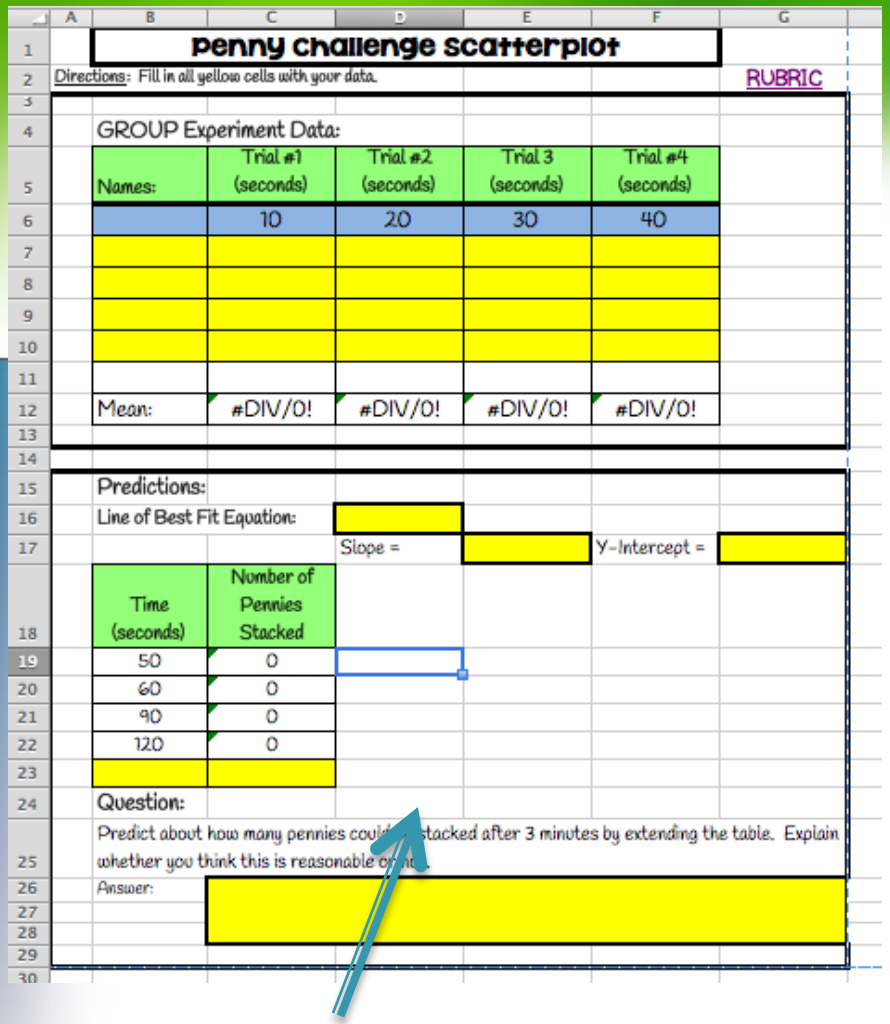
Day One: Project Introduction Begin Experiment

Day Two: Finish Data Collection and Create graphs of Data

Day Three: Create Line of Best Fit, Make predictions & Record Class Data

Day Four: Make new predictions & Graphs with Class Data

Student Spreadsheets



penny challenge scatterplot

Directions: Fill in all yellow cells with your data. RUBRIC

GROUP Experiment Data:

Names:	Trial #1 (seconds)	Trial #2 (seconds)	Trial 3 (seconds)	Trial #4 (seconds)
	10	20	30	40
Mean:	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Predictions:

Line of Best Fit Equation: Slope = Y-Intercept =

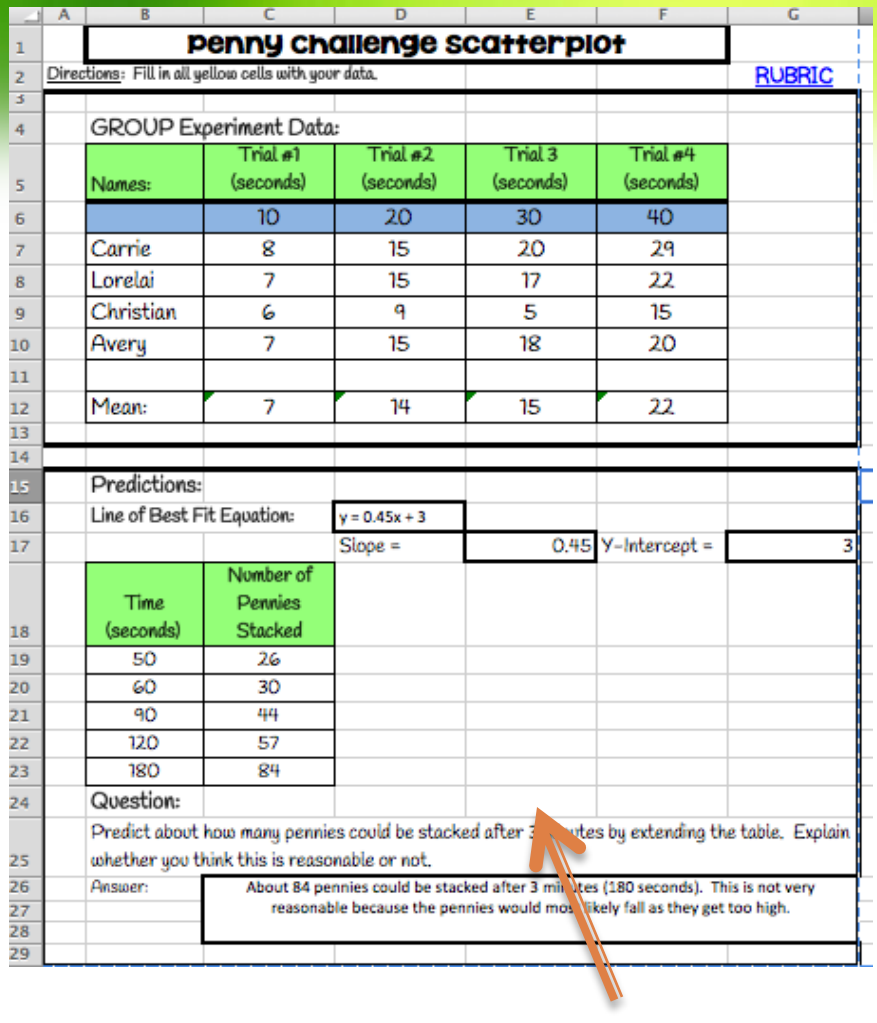
Time (seconds)	Number of Pennies Stacked
50	0
60	0
90	0
120	0

Question:

Predict about how many pennies could be stacked after 3 minutes by extending the table. Explain whether you think this is reasonable or not.

Answer:

Student Blank Spreadsheet



penny challenge scatterplot

Directions: Fill in all yellow cells with your data. RUBRIC

GROUP Experiment Data:

Names:	Trial #1 (seconds)	Trial #2 (seconds)	Trial 3 (seconds)	Trial #4 (seconds)
	10	20	30	40
Carrie	8	15	20	29
Lorelai	7	15	17	22
Christian	6	9	5	15
Avery	7	15	18	20
Mean:	7	14	15	22

Predictions:

Line of Best Fit Equation: y = 0.45x + 3

Slope = 0.45 Y-Intercept = 3

Time (seconds)	Number of Pennies Stacked
50	26
60	30
90	44
120	57
180	84

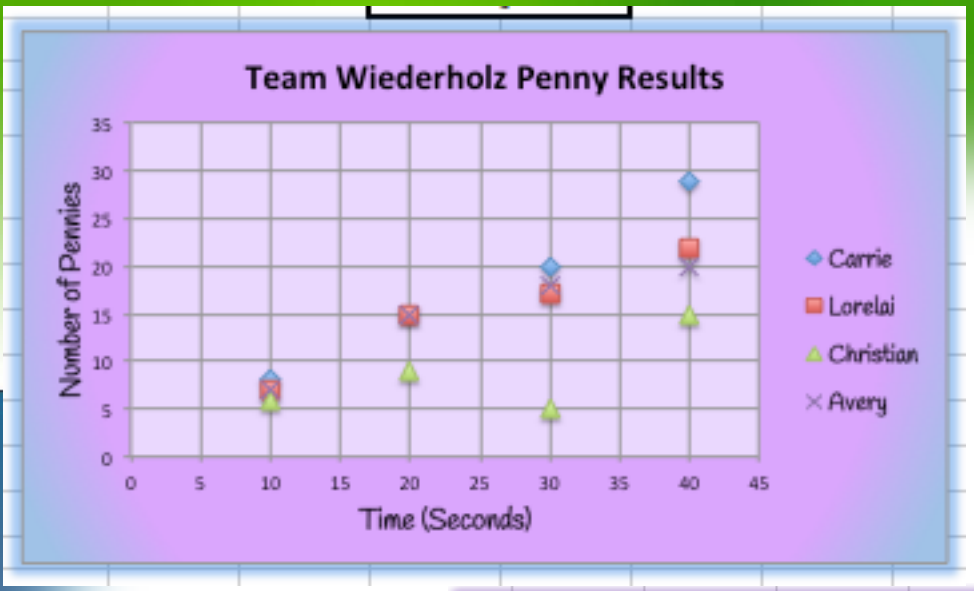
Question:

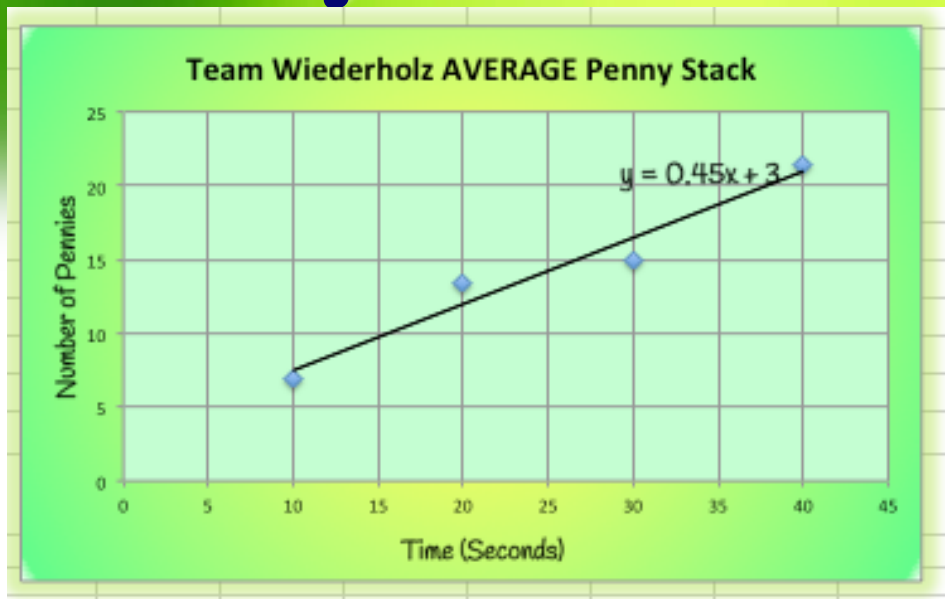
Predict about how many pennies could be stacked after 3 minutes by extending the table. Explain whether you think this is reasonable or not.

Answer: About 84 pennies could be stacked after 3 minutes (180 seconds). This is not very reasonable because the pennies would most likely fall as they get too high.

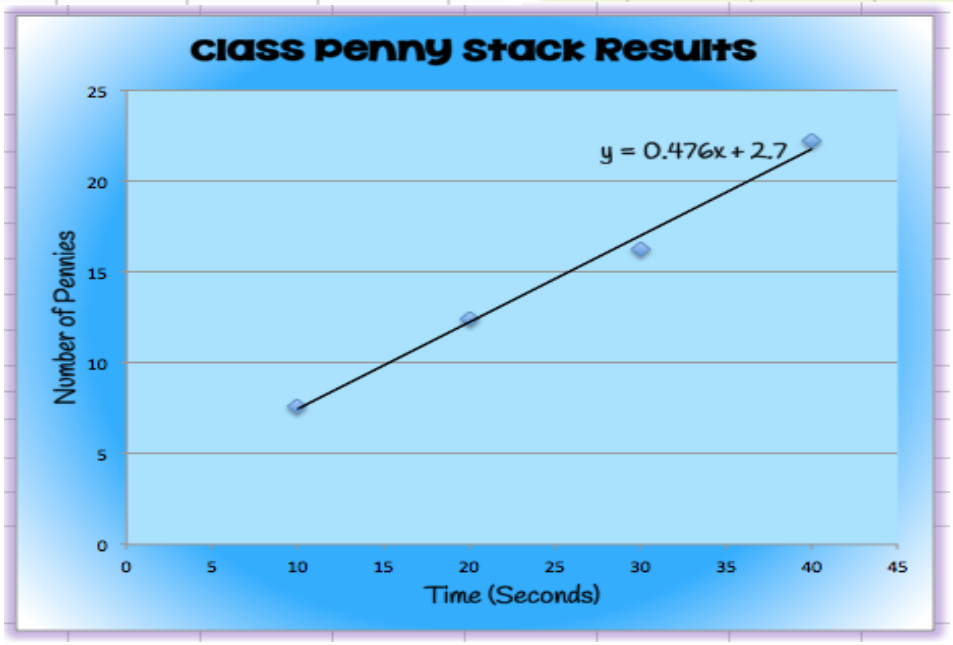
Student SAMPLE Spreadsheet

Student Scatterplots





First the students compare their results in a scatterplot.



Then they find a line of best fit using their average data first as a group and then as a class.

Rubric

Students will be individually Graded on the project using this rubric which has a sum formula to calculate The final project grade.

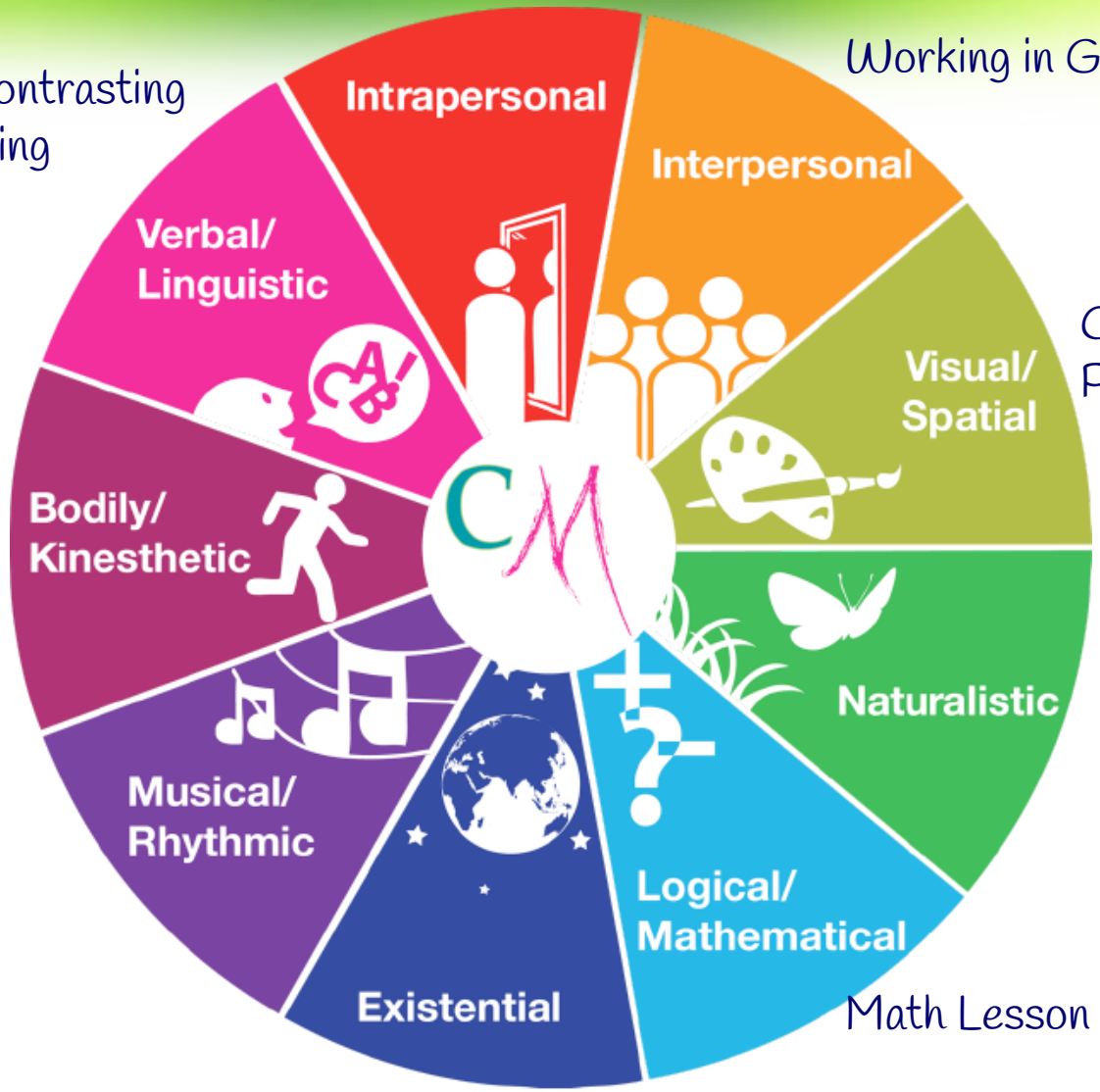
	A	B	C	D	E	F	G
1	Name: _____						Algebra I
2							
3			**Penny STACK SCATTERPLOT**				
4			Mrs. Wiederholz				
5				RUBRIC			
6							
7	Data Tables					10 points	
8		All yellow cells filled in.					
9		All trials completed.					
10							
11							
12	Predictions					15 points	
13		Line of Best Fit equation is filled into cell.					
14		Correct Slope & Y-intercept are filled in.					
15		Prediction table is complete and includes 3 minute prediction.					
16		Prediction question is answered correctly in complete sentences.					
17							
18	Graphs					20 points	
19		There is a scatterplot graph of team data.					
20		There is a scatterplot graph of the average team data with a line of best fit					
21		There is a scatterplot graph of the class average data with a line of best fit.					
22		Graphs contain all axis labels and a title.					
23		Graph colors are changed and are appealing to the eye.					
24		Graphs are placed on graph page.					
25							
26	Class Participation					5 points	
27		Student participated in the experiment.					
28		Student helped to create Excel Spreadsheet data & graphs.					
29		Student positively participated in project and stayed on task without redirection.					
30							
31			Project Grade:		0%		
32							
33							

Gardner's Multiple Intelligences

Individually creating class spreadsheet and graph.

Working in Groups

Comparing/Contrasting Results & Making Predictions



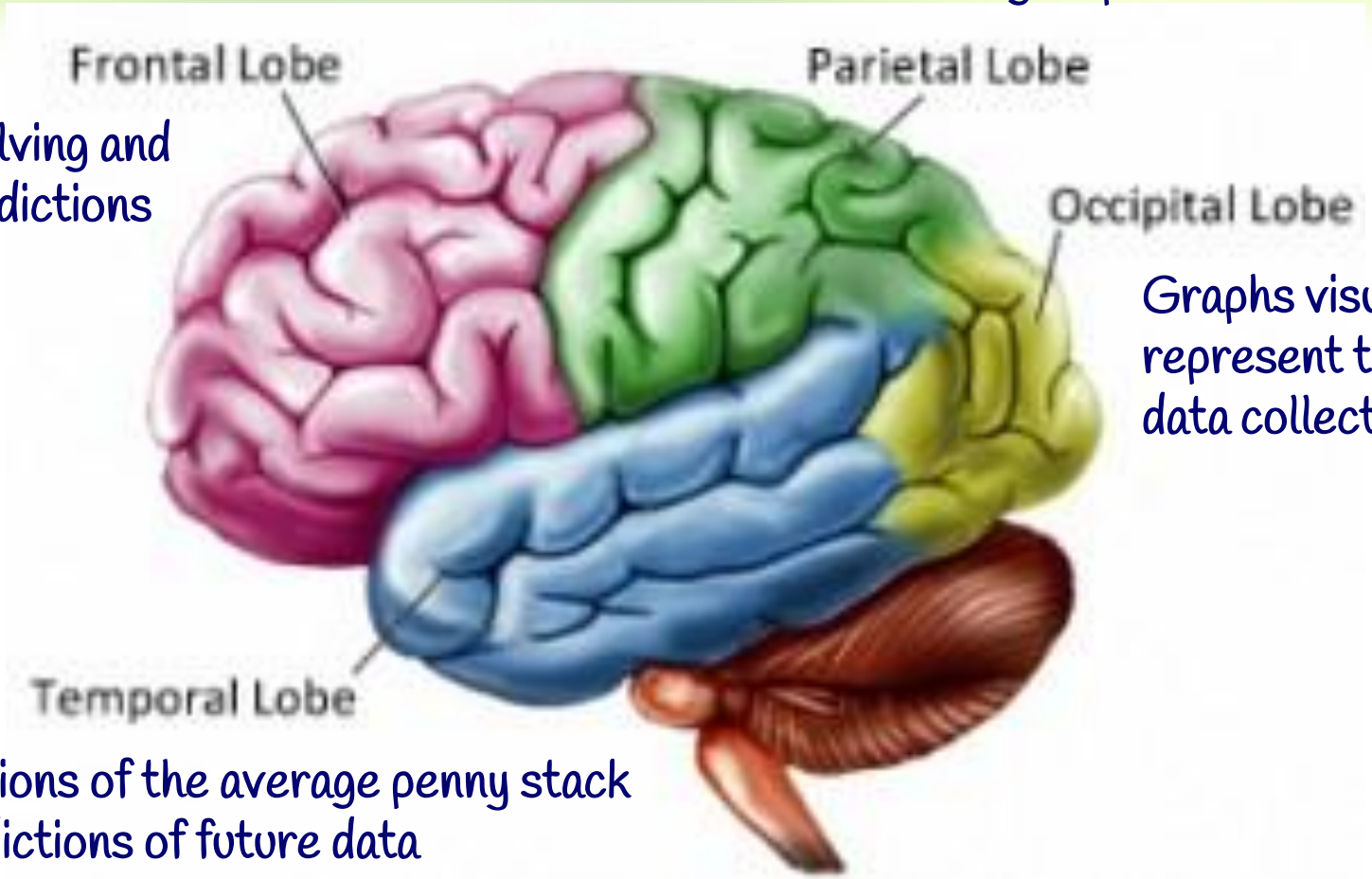
Creating Visually Pleasing Graphs

Penny Stack Experiment

Math Lesson – Excel Formulas

The Brain's Lobes

Communication during group time



Problem solving and making predictions

Graphs visually represent the data collected.

Calculations of the average penny stack and predictions of future data

Resources

Gardner, H. (1983). *Frames of mind: The Theory of Multiple Intelligences.* New York: Basic Books

Sousa, D. (2011). *How the brain learns* (4th ed.). Thousand Oaks, Calif.: Corwin Press.

Picture Sources:

Penny Stacks:
(slide one) http://www.pasco.k12.fl.us/graphics/penny_stack.jpg

(slide two) http://cache1.asset-cache.net/xt/138350257.jpg?v=1&g=fs1%7C0%7CPCF%7C50%7C257&s=1

(slide three) http://wdfyfe.files.wordpress.com/2012/04/penny1.jpg

(slide five)
https://jennysmithlynn.files.wordpress.com/2011/08/pennies.jpg

(slide eight) Rubric: http://cutthatbill.com/more-on-investing-in-copper-pennies

Excel Computer:
http://30deedsdotcom.files.wordpress.com/2013/02/happy_computer_parch_excel.jpg

Gardner's Multiple Intelligences: http://inopen.in/wp-content/uploads/2013/05/multiple-intelligence.png

The Brain's Lobes: http://nbia.ca/brain-structure-function/