NGSS PRACTICE: ANALYZING AND INTERPRETING DATA
SOUTHERN CT STATE UNIVERSITY

ANALYZING DATA
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ACTIVITY 1: ROLLING THE DICE

Please answer each of the following questions alone. Then, discuss with your group members.

1) If you roll a die one time, what do you expect to get? _____

2) If you roll a die one time, what is the probability of getting a "2"? _____

3) If you roll a die one time, what is the probability of getting a "6"? _____

4) If you roll a die one time and you got "2". Which is more probable and why?
A: "All group members get "2"
B: "Group members get different results"
_____

5) If you roll a die one time and you got "2". You roll the die again.
What is the probability that you get "2" a second time?
_____

6) Which is more probable and why?
A: "Roll a die twice and getting "2" each time"
B: "Rolling 2 dice and getting "2" on each"
_____

Each of the group members get a die.
Roll the die 12 times and tally the answers in the table. Then, collect the answers for your group and add them to the table:

	1	2	3	4	5	6
One person						
Group						

Time for discussion

Simulations
http://archives.evergreen.edu/webpages/curricular/2003-2004/doingscience/flash/dice.html

ACTIVITY 2: GRAPHING DATA

Rainbow trout (Onchorhyncus mykiss) taken from four different localities along the Spokane River during July, August, and October of 1999 were analyzed for heavy metals by the Washington State Department of Ecology. As part of the study, the length (in mm) and weight (in grams) of each trout were measured. Below is a subset of the data:

Length	Weight		Length	Weight
405	715		365	540
460	895		390	660
347	432		385	609
259	202		360	557
265	223		392	623
280	248		413	754
438	840		395	584
324	353		453	975
337	363		270	209
318	340		351	506

Graph the data on the next page.

Based on your graph, what would you predict a 326-mm trout would weigh? What would you predict a 502-mm trout weigh?

How confident are you with your predictions? Why? Is there anything you could have done to obtain a "better" prediction?

Problem from: Langkamp, G. & Hull, J. (2007). *Quantitative Reasoning and the Environment: Mathematical Modeling in Context*. Pearson: NJ.

Data from: https://fortress.wa.gov/ecy/publications/documents/0003017.pdf

ACTIVITY 3: EXCEL

Excel activities will be on the computer

Line of Best Fit applet: http://tube.geogebra.org/student/m336497

ACTIVITY 4: STATISTICS WITH GEOGEBRA

1) From the **view menu**, **open a Spreadsheet**
2) Enter the following data in column A. The data represent the sales of soda in a restaurant over 15 days. {Sales, 2, 4, 5, 6, 12, 12, 34, 100, 12, 52, 45, 65, 23, 1, 12}
3) Select the data to analyze and **choose "one variable analysis**"
    - If you highlight the data, you can only analyze that amount of data; you can modify it and study it but cannot add more values.
    - If you select the column, when you enter more values, statistics are modified accordingly.
    - For this task, please select column A
4) Click on "**One Variable Analysis**", and from the option menu, select "use header as title".
5) Click on the icon at the top right side of the pop up window to show the view in the main menu.
6) From Options (right arrow, right hand), modify the dimensions of the graph (min and max for y and for x and the steps).
7) Change the classes manually
8) Answer the following questions:
    - How would the histogram change if we change the classes?
    - What is the advantage of choosing small classes? Large classes?
9) Modify the data values and observe the changes in the histogram.
10) From the **"Data Analysis Window**", show statistics.
11) Add 5 more values to column A so that the mean becomes "30"

12) Choose "2nd plot" and plot another histogram
13) From Options menu (right arrow, right side), set the class width for the first histogram to be 20 and to the second histogram to be 5.
14) Compare the graphs. Which graphs tell more info about data
15) Right click on the first graph and copy it to graphics. Change the color of the graph.
16) Using the tool "Insert text", add a text with your own remarks.
17) From the spreadsheet, create a table with the raw data (the table is created in Graphics)
18) Add title to the graph, label axes.

ACTIVITY 5: BEST FIT CURVES WITH GEOGEBRA

1) Enter the following data to spreadsheet (Number of birds)

age	survivors
0	210
1	91
2	78
3	70
4	65
5	62
6	42
7	23
8	15
9	14
10	11
11	10
12	4
13	3
14	2
15	1

2. Choose "Two-variable regression analysis"

3. Data analysis: choose the regression model that you want.

FitLine	Regression line
FitExp	$a.e^{bx}$
FitGrowth	$a.b^{x}$
FitPower	$a.x^{b}$
FitLog	Log. Regression Curve
FitLogistic	$\frac{a}{1+be^{(-kx)}}$
Fit[list of points, list of fucntions]	Create a linear combinations of functions that best fit the points

ACTIVITY 6: STACKED BOXPLOTS WITH GEOGEBRA

1) Let column 1 represent the sales of Juice, Column 2 the sales of burgers and Column 3 represent the sales of Soda in 10 days.
2) Enter Juice in Column A and then enter the following 10 values, representing the sales of juice during 10 days {4, 5, 6, 7, 12, 14, 15, 25, 34, 12}
3) Enter "Burgers" in Column B an then enter the following 10 values, representing the sales of juice during 10 days {34, 35, 46, 47, 12, 44, 35, 55, 44, 65}
4) Enter "Soda" in Colum B an then enter the following 10 values, representing the sales of juice during 10 days {34, 45, 26, 57, 12, 48, 55, 95, , 75}
5) Choose Multiple variable analysis to compare the three boxplots
6) Copy the graphs to clipboard and copy it to a Word document