Give Your Students a Hands-On Feel to Analyzing Data using PowerPoint!

Margo Lynn Mankus
State University of New York
at New Paltz
mankusm@newpaltz.edu
http://mason.gmu.edu/~mmankus

GO PAPERLESS!! SAVE A TREE!
TODAY'S INFORMATION IS AT
http://nctm2008mlm.angelfire.com/

Image source is unknown! Help?

Agenda

- Multiple Representations!
  - Planning for Real (Concrete) ↔ Representational ↔ Abstract in our Teaching
- Good Old M&M's
  - Using Various Hands-On Strategies
  - Software for Graphing - Do the students feel the graphs?
  - Using PowerPoint Custom Animation to Grab Their Attention
  - Using PowerPoint Custom Animation for the "Hands-On Feel"
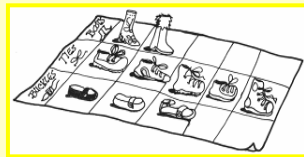
2

Nice to Meet You!

- Introduction
- Grade Level?
- Are you using
  - PowerPoint?
  - SMART Notebook? (Watch for Version 10!!!)
- Do you have your students use
  - EXCEL for Graphing?
  - Graphing Calculator?
  - Graphing Applets (Web Based)?
  - Create their own PowerPoint presentation to *COMMUNICATE* their Mathematics?
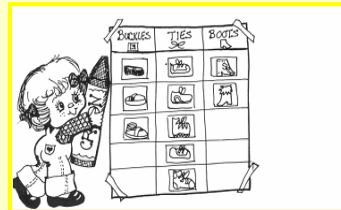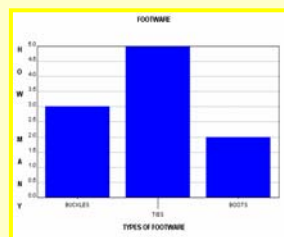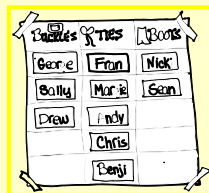
3

Graphs can be…

REAL

REPRESENTATIONAL

ABSTRACT

NYS Math Mentors Network Images

4

Some Technology We've Been Using...

Bar Graph Applets
> Shodor Education Foundation:
> http://www.shodor.org/interactivate/activities/BarGraph/

> **NCTM Illuminations**
> http://illuminations.nctm.org/ActivityDetail.aspx?ID=63

Circle Graph
> http://illuminations.nctm.org/ActivitySearch.aspx

NCEC Grapher for Kids – FREE and Amazing
> http://nces.ed.gov/nceskids/createagraph/

EXCEL

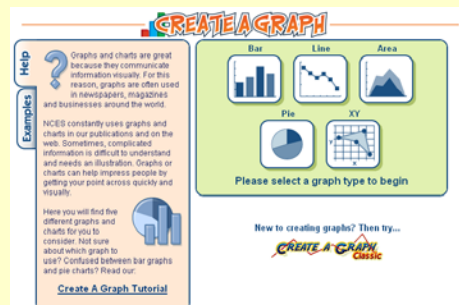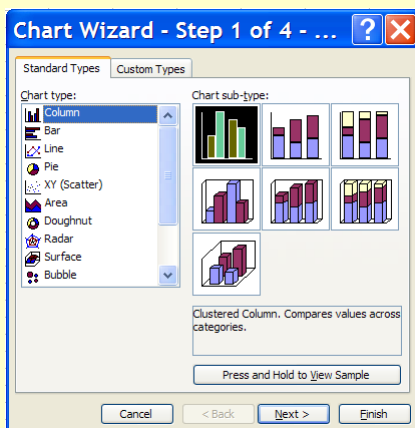**Graph Club 2.0** by Sunburst

Calculators
> Graphing: TI-73 Explorer, TI-84 Plus, TI-Nspire
> Scientific: TI-30 MultiView & TI-34 MultiView (New)

5

My Issue...

Graphs happen too fast! Everything is magic!

http://nces.ed.gov/nceskids/createagraph/default.aspx

6

Good Old M&M's -

- Sorting Data – Find your color!

- Human Bar and Circle Graph

- Bar Graph using Post-Its

- Bar Graph using web grapher
  http://nces.ed.gov/nceskids/createagraph/

- Bar Graph using Excel or Graph Club

- Question: Is a Line Graph appropriate?

http://us.mms.com/us/about/products/milkchocolate/   7

M&M Bar Graph by Touch!

6
5
4
3
2
1

Brown   Red   Orange   Yellow   Green   Blue

M & M's
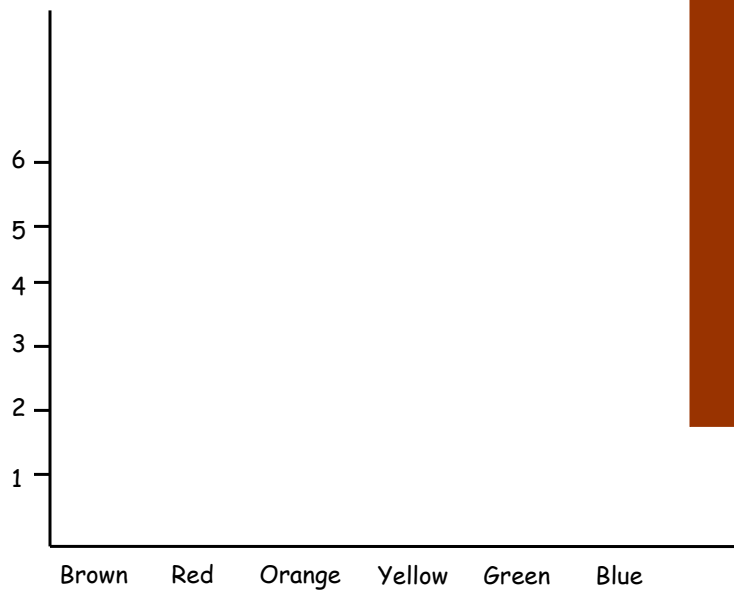
8

M&M Bar Graph Using Animation!

Color	Number
Brown	4
Red	5
Orange	3
Yellow	4
Green	4
Blue	6

Brown Red Orange Yellow Green Blue

9

Move to a Bar Graph

Color	Number
Brown	4
Red	5
Orange	3
Yellow	4
Green	4
Blue	6

Brown Red Orange Yellow Green Blue
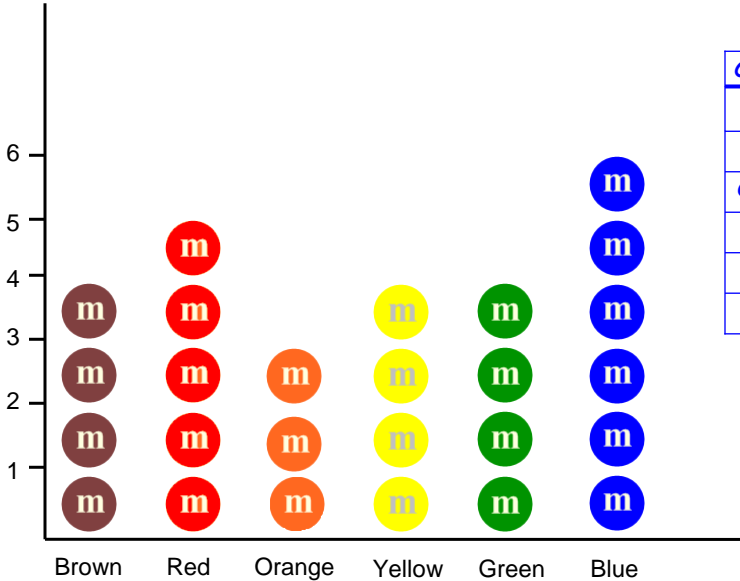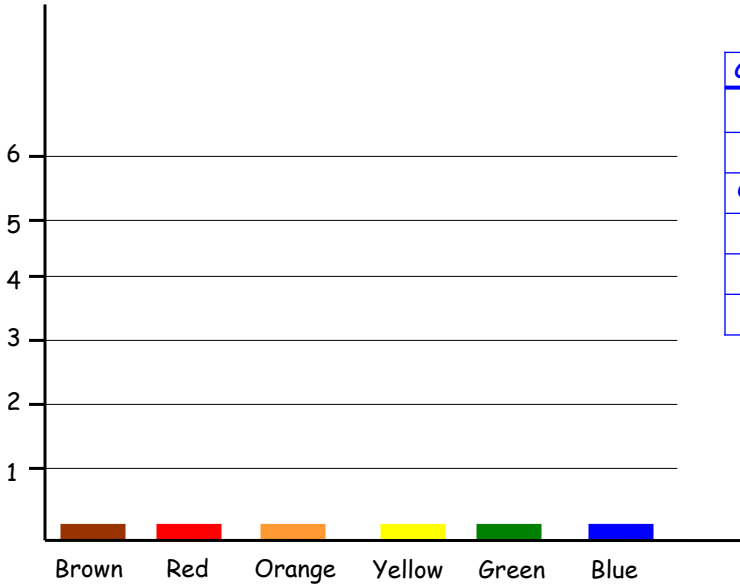
10

Sample NYS Test Questions

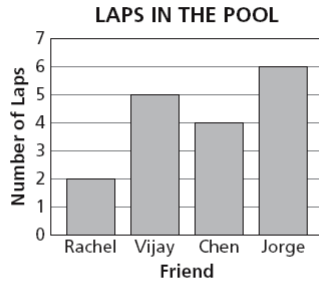25 Rachel and her friends swam laps in a pool. The bar graph below shows the number of laps each friend swam.

LAPS IN THE POOL

How many **more** laps did Jorge swim than Rachel?

A 2

B 4

C 6

D 8

NYS 3th Grade Sample Test

Language:

Categorical Data

Numerical Data

Discrete Set of Numerical Data

Axis

Range

Bar Graph

STOP

11

M&M Pie Chart!

12

6

DYI!

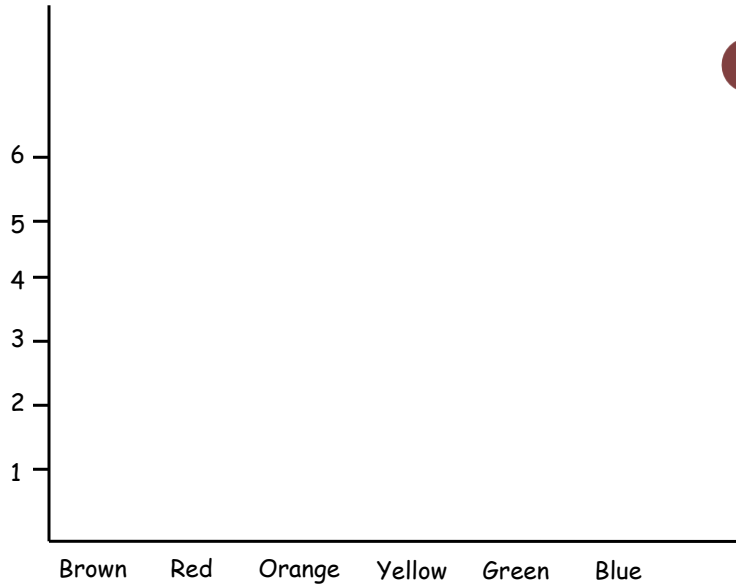|					
Brown	Red	Orange	Yellow	Green	Blue
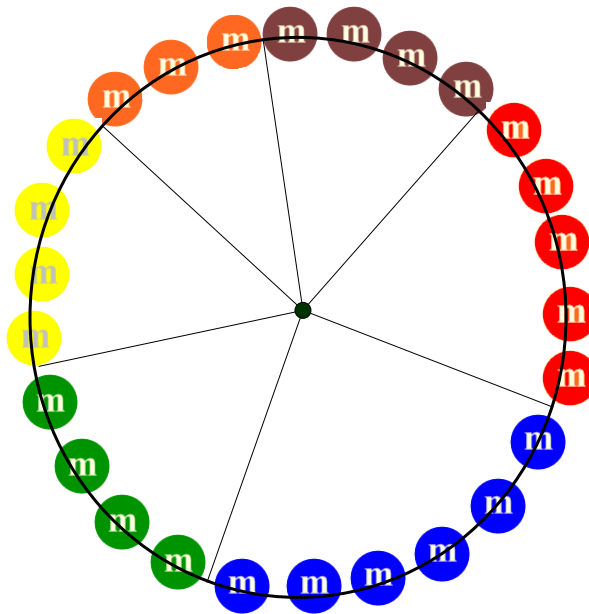
DYI! Venn Diagram

6.S.3 Construct Venn diagrams to sort data

6.S.3a - There are 20 students in Jolene's class. She noticed 8 students are wearing jeans, 7 students are wearing tshirts with the school logo, and 3 students are wearing both jeans and the school t-shirt. Construct a Venn diagram to represent the data. How many students are wearing jeans and a t-shirt? How many students are wearing pants other than jeans and a t-shirt without the school logo?

Jeans

Logo T-Shirt
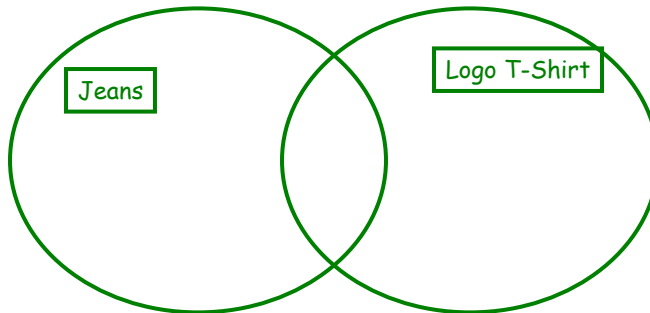
6 The line graph shows the number of students in the fifth grade at Sunshine School from 2001 to 2005.

SUNSHINE SCHOOL

Number of Students

160
150
140
130
120
110
100
0

2001 2002 2003 2004 2005

Year

In which year were the **least** number of students in the fifth grade at Sunshine School?
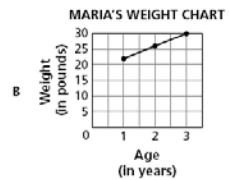
F 2001
G 2002
H 2003
J 2004
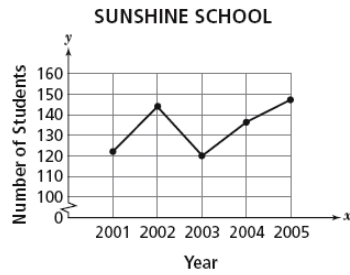
Language?

Type of Data Set?

Line Graph

Axis – notice the y axis here

Should we connect the dots?

NYS 5th Grade Sample Test

15

---

23 The table below shows Maria's weight at different ages.

MARIA'S WEIGHT CHART

Age (in years)	Weight (in pounds)
1	22
2	26
3	30

Which graph correctly shows the information in the table?

MARIA'S WEIGHT CHART

A

Weight (in pounds)
30
25
20
15
10
5
0

Age (in years)
1 2 3

MARIA'S WEIGHT CHART

C

Weight (in pounds)
30
25
20
15
10
5
0

Age (in years)
1 2 3

MARIA'S WEIGHT CHART

B

Weight (in pounds)
30
25
20
15
10
5
0

Age (in years)
1 2 3

MARIA'S WEIGHT CHART

D

Weight (in pounds)
30
25
20
15
10
5
0

Age (in years)
1 2 3
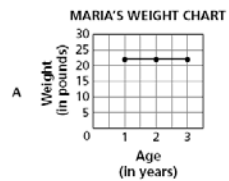
NYS 5th Grade Sample Test

Language?

What type of Data Set?

Line Graph?

Should we connect the dots?

16

8

A Case of Appearances – An opportunity to read, think and analyze!

Martin, L., Miller, M., (2001). 40 Fabulous Math
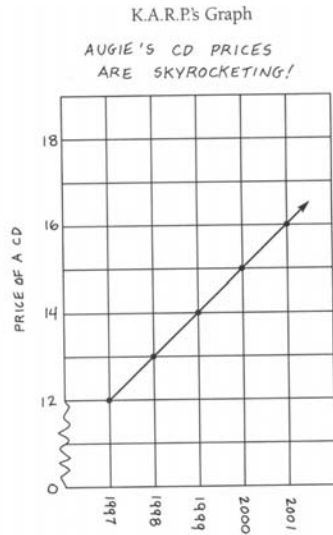Mysteries Kids Can't Resist, Grades 4-8. New York,
NY: Scholastic.

17

Sample Tasks from the NYS Standards

Organization and Display of Data
5.S.2 Display data in a line graph to show an increase or decrease over time

5.S.2a - Construct a line graph from the information listed below:
Normal Monthly Temperature in Fahrenheit for Albany, New York

January	22
February	25
March	36
April	47
May	58
June	66
July	71
August	69
September	61
October	48
November	39
December	28

(Source: World Almanac, 2004)

18

Sample Tasks from the NYS Standards

6.S.3 Construct Venn diagrams to sort data

6.S.3a - There are 20 students in Jolene's class. She noticed 8 students are wearing jeans, 7 students are wearing tshirts

with the school logo, and 3 students are wearing both jeans and the school t-shirt. Construct a Venn diagram to represent the data. How many students are wearing jeans and a t-shirt? How many students are wearing pants other than jeans and a t-shirt without the school logo?

6.S.4 Determine and justify the most appropriate graph to display a given set of data (pictograph, bar graph, line graph, histogram, or circle graph)

6.S.4a - The chart below shows the number of bottles each 6th grade class has collected for the recycling drive. What would be the best way to display the data? Show your choice and explain your answer.

Number of Bottles Collected in a Week

Class	# of bottles
6A	75
6C	103
6K	87
6L	38
6P	110
6T	63

19

Sample Tasks from the NYS Standards

7.S.3 Convert raw data into double bar graphs and double line graphs

7.S.3a

Give each student a 1/2 ounce box of raisins, but do not let them open the boxes. Ask them how many raisins they think would be in one of these boxes. Record the student responses on a chart containing the names of the students along with two columns, one labeled *prediction* and one labeled *actual count*. Next have them actually count the number of raisins in each box and record these results. Have the students create a double bar graph comparing the predicted results to the actual results. Discuss the scale used and how to make a key to differentiate between the two bars used for each person, one for estimate and one for actual count. Once the graphs are completed, follow up with questions from 7.S.6a. The students can also create a double line graph, or half of the students could construct a double line graph and the other half a double bar graph. Have the class compare their graphs and discuss the advantages and disadvantages of each method.

20

Thank You!

Margo Lynn Mankus
mankusm@newpaltz.edu

Any Questions?

GO PAPERLESS!! SAVE A TREE!
TODAY'S INFORMATION IS AT
http://nctm2008mlm.angelfire.com/