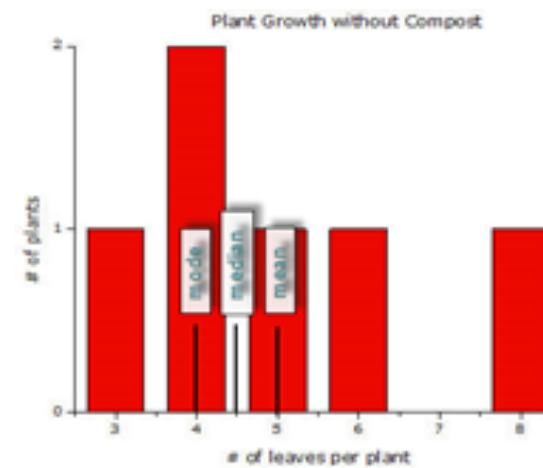
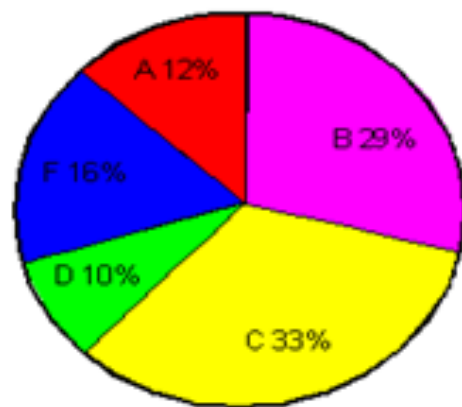




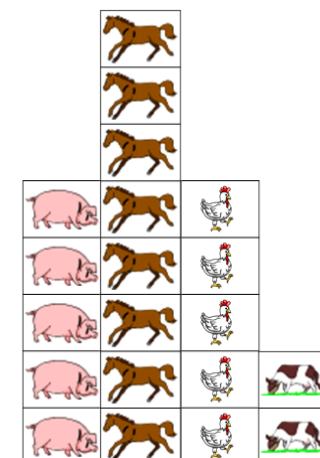
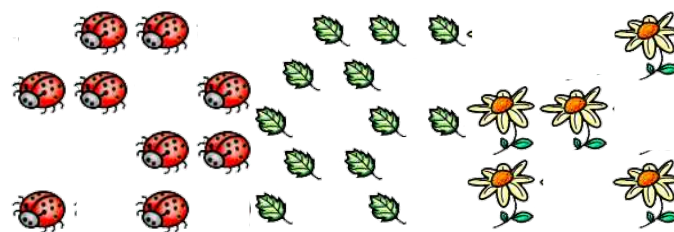
Data Management



J. Graham



Real Graphs/Concrete Graphs

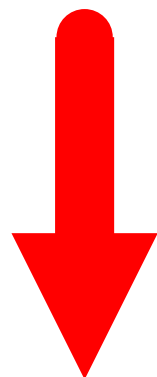


Picture Graph



Pictograph

Concrete

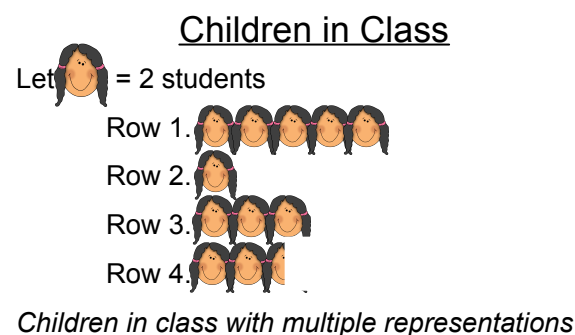


One-to-one correspondence (Gr.1&2)



Pictorial

Many-to-one correspondence (Gr.3)



Line Plots
(Gr. 2)

Bar Graphs
- vertical (Gr.3)
- horizontal (Gr.3)
- double bar (Gr.4)

Stem & Leaf Plots
(Gr.4)

Test results: 72, 64, 68, 82, 75, 74, 68, 70, 92, 84, 77, 59, 77, 70, 85

Line Graphs
- broken lines (Gr.5)
- continuous (Gr.6)

Abstract

5	9
6	4, 8, 8
7	0, 0, 2, 4, 5, 7, 7
8	2, 4, 5
9	2



POSE A CHALLENGE OR SITUATION

Scenario 1: Favourite Colours (K) - consider question/categories

Scenario 2: Birth Order (Gr. 5) - categories/definitions

DEVELOP A PLAN TO GATHER DATA

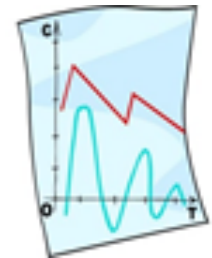
Scenario 1: Favourite Colours (K)

different questions lead to different data

everyone must be asked the same questions

people may respond differently depending on choices offered

people may respond differently at different times of the day



GATHER DATA

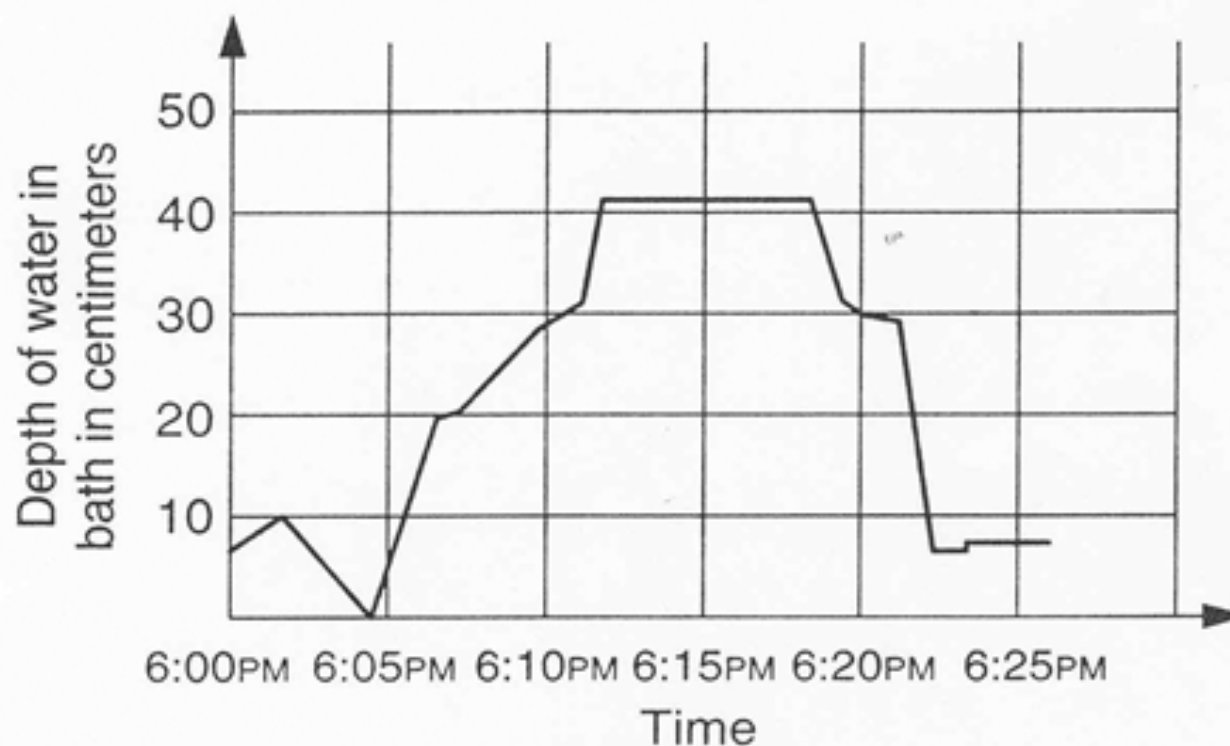
DISCUSS/THINK ABOUT/ORGANIZE DATA

Farmer MacDonald

ANALYZE & COMMUNICATE DATA

Scenario 2: (Gr. 5) - questioning the conclusions

Which Graph is Which?/Bath Tub Story/The Graph with the Real Story?



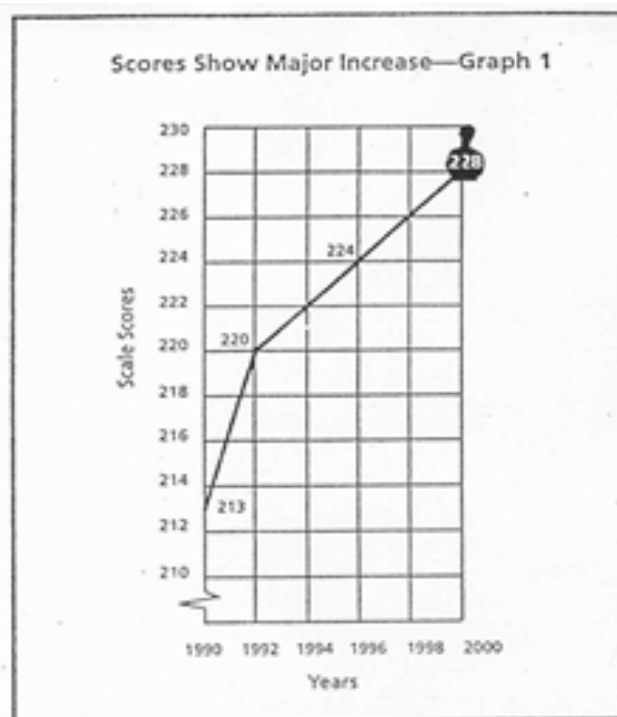
Tell me a story

*Task template for understanding data on graphs.
Source: Indiana Department of Education, 1993.*



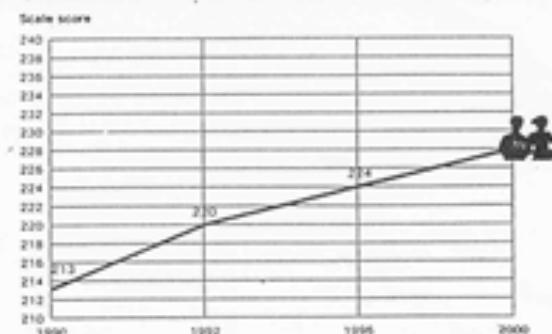
DOES THE GRAPH TELL THE REAL STORY???????

National Council of Teachers of Mathematics, News Bulletin, November 2002, Volume 39, Issue 4



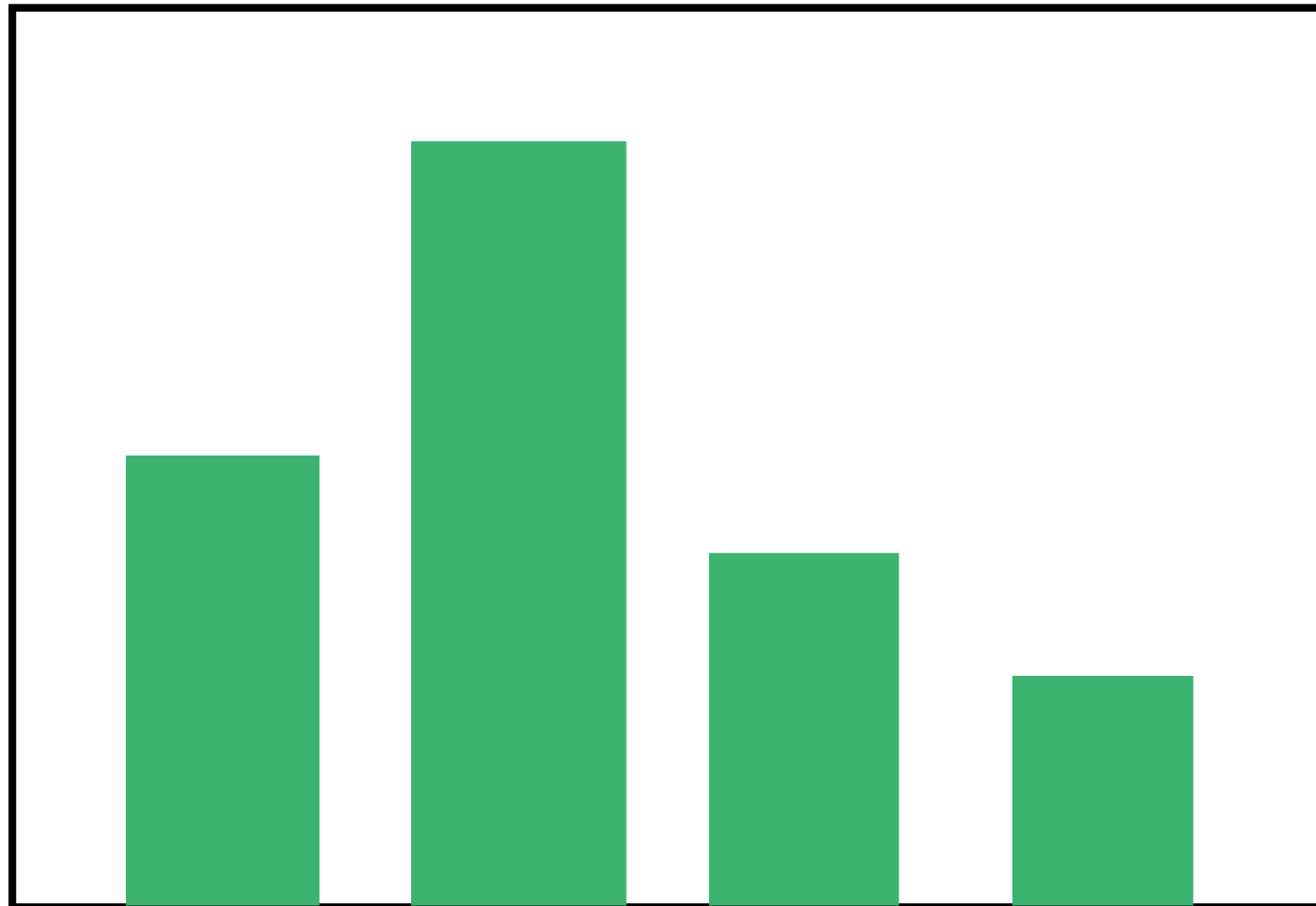
The main NAEP shows dramatic gains in math.

From 1990 to 2000, fourth grade math scores increased fifteen points— equivalent to about 1.7 years of learning.





Name the Graph



1. What do you think this might be the graph of? Put names and numbers on the graph to show what you mean.
2. Write down everything you know from your graph.

Farmer MacDonald



Farmer MacDonald decided to make a graph to show the number of animals on his farm. He must do some mathematical calculations before he can prepare his graph. Here is what Farmer MacDonald knows about his animals:

He has 12 cows

He has $\frac{1}{2}$ as many pigs as cows

He has 4 more chickens than pigs

He has 4 more sheep than chickens

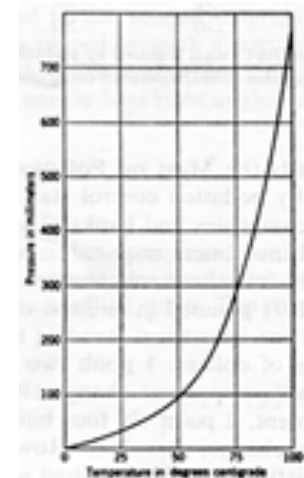
Organize and display the data by creating a graph to represent Farmer MacDonald's animals. Explain how you organized the data.





GUIDING GRAPHING EXPERIENCES

- **Use information that interests students.**
- **Provide opportunities for students to collect their own data and decide how to best represent those data graphically.**
- **Consider alternate ways of graphically representing the same data. This includes changing the scales as well as the kinds of graphs.**





- Present some data that are hard to digest or at least difficult to grasp without a graph.
- Pose questions that go beyond direct reading of graphs, and encourage students to both describe and interpret the information.

Reys, Suydam, Lindquist. (1995). Helping Children Learn Mathematics





STATISTICS

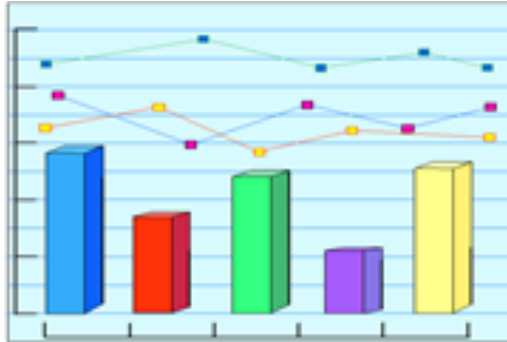
Most children in the 5th grade are 12 years old.

The median family income is \$25,250.

The average temperature today was 29°

- **C → R → A**
- **start with the concrete before introducing computations as greater understanding results**
- **need to focus not only on the “HOW TO” but also “WHEN” is the information useful or “WHY” is it useful**
- **need to ascertain “WHICH” average is most appropriate for a given situation...mean, median, or mode ...**

CONTEXT MATTERS!!!!



AVERAGES

Measures of Central Tendency Measures of the Center

Mode:

- the value that occurs most frequently in a collection of data

Median:

- the middle value in a set of data
- the same number of values are above as below the median

Mean:

- arithmetic average
- add up all the values involved and divide by the number of addends



WHAT'S AVERAGE?

Each of the three kinds of average has strengths that make it a better typical measure for a given set of data than the other two. Decide which average, the mean, the median, or the mode, is best used for each data set shown below. Explain your choice.

1. Average salary in a large company.
2. Average test score for a student.
3. Average size of a cereal box in a grocery store.
4. Average price of a room in a hotel.
5. Average year of a car in a used-car lot.
6. Average monthly electric bill.

