Seeing The World Through Numbers

☘ VIDEO OVERVIEW ☘

Seeing the World Through Numbers explores how to interpret statistical data using graphical and mathematical models. The meaning of bell curves and averages are discussed, along with skewed data, and patterns that form on graphs.

Various examples of studies conducted by Students for a Better Earth are discussed including a carpooling study. In the process students:
- Read, interpret, and construct a bar chart and double bar chart.
- Read, interpret, and construct a pie chart.
- Read, interpret, and construct a line graph.
- Read, interpret, and construct a frequency diagram.
- Read, interpret, and construct a control chart.

The following key concepts are presented in the video.
- Interpreting chart patterns provides a way to predict the future
- A rectangular pattern occurs on frequency charts when each of the items you are plotting have an equal probability of occurring.
- The normal or bell curve is the most expected type of pattern for frequency charts.
- The highest point of the bell curve is the average of all your statistical data.
- When a survey doesn't produce a normal curve, there is usually a reason that requires investigation.
- A run chart is a line graph that records a particular measurement over a period of time.
- Control charts are a type of run chart often used for quality control in business.
- A shift occurs when there is a dramatic jump on a run chart.
- Freaks or outlyers are plots that stick out away from the rest.
- A cycle pattern moves up and down with a rhythm.
- Runs are seven or more successive plots on one side of the normal process average.
- Scatter diagrams or correlation charts are used to compare two different sets of data.

☘ DISCUSSION QUESTIONS ☘

Before viewing the video, set the scene by asking your class the following questions. After soliciting some answers, distribute the answer sheets.

Question 1 - What is the highest point of a bell curve called?

Answer - The average.

Question 1 - What should you do when a survey does not produce a bell curve on a frequency chart?

Answer - You should investigate the cause since there will be a reason for this lack of normal variation.

Question 1 - What can you chart with a run chart?

Answer - Measurements over a period of time.

Question 1 - If you wanted to compare two different sets of data, what type of chart would you use?

Answer - A scatter or correlation chart.

☘ MATH PROBLEMS ☘

After you are finished watching the video, complete the following math problems to assist Students for a Better Earth in their statistical study.

Problem 1:
While conducting a carpooling study, students observed the following number of vehicles and passengers within a one-hour period.

| Time	1 person	2 persons	3 persons	4 persons	5 persons	6 persons
0-15	56	12	2	0	2	0
15-30	66	14	0	1	1	1
30-45	78	10	1	3	0	0
45-60	89	8	3	1	1	1

A. What is the average number of people per car? _____
B. Which time period has the least number of cars? _____
C. Which time period has the most number of cars? _____
D. What can you tell about the traffic based on this data?
_____
E. What percentage of vehicles had at least 2 or more passengers?
_____

Problem 2:
Create a bar chart (histogram) to see the distribution of the number of people per car for the entire one-hour study. Use a separate color or shading for each number of passengers.

Problem 3:
Create a run chart with the number of total passengers per fifteen-minute period.

Seeing The World Through Numbers – Answer Key

❋ MATH ACTIVITY ❋

Problem 1:

While conducting a carpooling study, students observed the following number of vehicles and passengers in a one-hour period.

Time	1 person	2 persons	3 persons	4 persons	5 persons	6 persons
0-15	56	12	2	0	2	0
15-30	66	14	0	1	1	1
30-45	78	10	1	3	0	0
45-60	89	8	3	1	1	1

A. What is the average number of people per car? **1**
B. Which time period had the least number of cars? **0-15**
C. Which time period had the most number of cars? **45-60**
D. What can you tell about the traffic based on this data?
As time went by, there was more traffic.
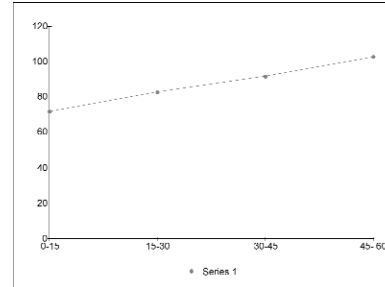E. What percentage of vehicles had at least 2 or more passengers? **17.4%**

Problem 2:

Create a bar chart (histogram) to see the distribution of number of people per car for the entire one-hour study. Use a separate color or shading for each number of passengers.
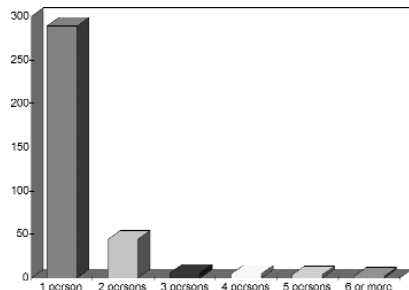
Problem 3:

Create a run chart with the number of total passengers per fifteen-minute period.

Measuring Your World

Seeing The World Through Numbers

INTERPRETING STATISTICAL DATA

TEACHER'S GUIDE

K5054