

# Betsy Fochs & Linda Frost

## Lesson Plans

### Data Analysis

Text: *Prealgebra*, Aufmann, Barker & Lockwood, Houghton Mifflin, 3<sup>rd</sup> Edition

Reading assignment: pp. 585-587, 593-597

Topics:

- I. Organizing Data
  - a. Frequency Distribution
  - b. Histograms
  - c. Line Plot
  
- II. Statistical Measures
  - a. Mean, Median and Mode
  - b. Box and Whiskers Plot

Allotted Time: 1 ½ Class Periods

### Class Period 1:

#### Organizing Data:

Present the data from the *Batteries* problem (Navigating through Data Analysis gr. 6-8, p.89 NCTM). Based upon this raw data does the student have an idea of which is the better battery to buy? Use a double stem and leaf diagram to sort the data into groups of ten. Graph the data as line plots. Use the line plots as a transition to histogram plots. Draw the histogram plot and stop to discuss the data. Now that the data is organized what are the students seeing? Any thoughts at this stage as to which is the better battery to buy? Why?

#### Statistical Measures:

Based upon their reading, ask the students to define mean, median, and mode. Using their definitions, break the students into five groups. Group 1 will use the data given to find the mean value of the Always Ready battery data. Group 2 will use the data given to find the mean of the Tough Cell battery data. Group 3 will find the medians of both sets of data. Group 4 will find the modes of both sets of data. Group 5 will redo the stem and leaf plots to sequence the data. The groups will go to the boards, tell the procedure they used, and present their findings. Group 5's stem and leaf plots will be used to create the box and whiskers plot. Any thoughts at this stage as to which is the better battery to buy?

Using the reorganized stem and leaf plots, students will be asked to find Q1 and Q3. What happens if Q1, Q3, or the median fall between two pieces of data? What then? When a consensus is reached as to the Q numbers for both sets of data a box and whiskers plot is drawn and explained. Discuss what the box and whiskers plot tells us about the life of the different batteries. Is one battery more dependable than the other? Is one more consistent? Why? Suppose you were a hiker and needed a battery that lasted more than 110 hours, which would you buy, based upon this data?

#### Take-home Project:

The students will take home the *Migraines* problem (Navigating through Data Analysis gr. 6-8, p.94 NCTM). Upon handing it out, ask the students to look at the graph for question #4. It is called a relative-frequency histogram. We have not discussed this particular histogram, but they should look at the horizontal and vertical axes' descriptions and figure out from there what to graph.

The *Migraines* problem has the students analyze the time elapsed for relief data from two different migraine headache drugs. The students will draw histograms, line plots, and box and whiskers plots using the data. The students will be expected to analyze the data and draw conclusions about it. Based upon their plots they will be asked not only which is the fastest acting drug, but also what are the advantages of the different types of graphs for data analysis.

**Class Period 2:**

Students will be called on to put their Migraine problem graphs on the board. Graphs include histograms, line plots, and box and whisker plots. Other students will be called upon to give their answers to the questions about the graphs and will be expected to justify their answers.

The class will then be divided into groups of two to collect data from rolling two dice. After a sufficient number of trials the students will contribute their results and a histogram will be drawn on the board as a summary of the total data collected. This task will be used as a lead in to the next topic, probability.

PERFORMANCE PACKAGE TASK 1  
(Title of Package)

Content Standard: Data Analysis

Level: Technical/  
Community College

***Specific Statement(s) from the Standard:***  
***Data Analysis (NCTM) Standard***

*Upon completion the student will be able to:*

- *Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them.*
- *Collect data using observations, surveys and experiments.*
- *Select and use appropriate statistical methods to analyze data*
- *Develop and evaluate inferences and predictions that are based on data*

***Product(s):***

*Given a container containing twelve colored cubes, gather data sufficient to predict the color make-up of the twelve cubes.*

***Task Description:***

*Given a small sealed container with a small window cut out, students will shake the container and view a glimpse of a single cube and record the color and shake and repeat until sufficient data is collected. They will analyze the data and make a prediction as to the color distribution of the cubes.*

***Special Notes:***

PERFORMANCE PACKAGE TASK 1  
(Title of Package)

**FEEDBACK CHECKLIST FOR TASK 1**

The purpose of the checklist is to provide feedback to the student about his/her work relative to the content standard. Have the standard available for reference.

Y=Yes

N=Needs Improvement

<u>Student</u>		<u>Teacher</u>
_____	The student gathered sufficient data.	_____
_____	The student organized the data in a reasonable way.	_____
_____	The student graphed the data.	_____
_____	The student's conclusions were reasonable, based upon the data	_____
_____		_____
_____		_____

**Overall Comments** (information about student progress, quality of the work, next steps for teacher and student, needed adjustments in the teaching and learning processes, and problems to be addressed):