

Statistics Lesson Plans, Grades 9-12
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Day 1

Introduction – students will have to understand the four major components of statistics as a process, they will have to 1) pose questions, 2) gather data, 3) analyze data, and 4) interpret data.

Review types of graphs and uses – Frequency Table, Line Plot, Histogram (Navigating Through Data Analysis, p.12-14).

Work through Migraines: Histograms (Navigating through Data Analysis, p. 94) worksheet together in class.

- 1) Arrange data in a frequency table, discuss grouping of data when a large range of data is used.
- 2) Display data from frequency table in a line plot.
- 3) Use line plot to display data to a histogram on the worksheet.
- 4) Discuss analysis of data in class, what does this type of display tell us? Does it raise any questions?

Day 2

Continue with types and uses of graphs. Review Bar Graphs, Circle Graphs (Navigating Through Data Analysis, p. 14-19).

1. Bar Graphs
2. Give students Cereal worksheet (Navigating through Data Analysis, p. 92) as an introduction to bar graphs, do on their own, then go over in class.

Circle Graphs

- 1) Conduct a survey in class – What is your favorite food. Keep the number of foods to a minimum, may have to have students make their selections, then narrow down to 3 or 4 choices, then vote again.
- 2) Convert to percentages, show that each category added together must equal 100%. Convert these percentages to degrees.
- 3) Construct a circle graph with this data.
- 4) Discuss the differences in sizes of each piece of the circle.

Day 3

- 1) Hand out Ready Reference 10 of different types of scatter plot correlations. Discuss.
- 2) Give students Reading a Scatterplot (Navigating through Data Analysis, p. 100-101) worksheet as an introduction, do on their own, then go over in class.
- 3) Discuss activities on p. 75-78 in Navigating through Data Analysis, work through worksheets on p. 103-104 in Navigating through Data Analysis.
- 4) Have the students measure and record their height in cm and shoe size.
- 5) Work together to display the data in a scatter plot.
- 6) Discuss any questions or predictions that can be made.
- 7) Have students keep data for future use.

Day 4

Continue with types and uses of graphs. Review Box and Whisker plots.

Box and Whisker

- 1) Review Mean, Median, Mode, Quartiles, and Range. Discuss Outliers and how they affect the data. Review the differences in mean and median and mode and what these tell us.
- 2) Work through Batteries worksheet (Navigating through Data Analysis, p. 89)
- 3) As a class discuss questions raised on p. 40 on Navigation through Data Analysis.

Day 5

Box and Whisker plots continued

- 1) Use data compiled previously of heights of all students to find mean, median, mode, quartiles, and range together in class. Discuss what each of these represent.
- 2) Construct Box and Whisker Plot of this data and discuss what this shows.
- 3) Students divide data into boys and girls, construct two box and whisker plots on same graph, one of the boys and other of the girls.
- 4) Discuss what the comparison of the two plots shows. Are there any outliers? Does this affect the data?

Day 6

Hand out Drop Off worksheet (Navigating through Data Analysis, p. 87). Discuss questions posed on p. 29, 30 in Navigating through Data Analysis. Students should complete worksheet, then discuss answers together in class.

Introduction to terminology and gathering data (Cord Mathematics, Working with Statistics, p. 3-31). Discuss different methods of gathering data and what is most suitable.

Day 7

Lecture and notes on terminology (Navigating through Data Analysis, p. 31-36)

- Spread and Variability
- Shapes of Distributions
- Standard Deviation
- Compare and draw conclusions about sets of data

Day 8

Standard Deviation

Work through activity on p. 20-26 in Cord Mathematics together in class.

After activity, hand out Vikings Players and their Weight, students should complete directions on the worksheet.

* Reminder – Students will need their data on hours they've watched TV.

Day 9

Students will organize their data on hours they've watched TV. Students will then have to choose the most appropriate ways to display this data, using the two best graphs. Find the mean, median, and mode. Analyze the data and draw conclusions, come up with questions. They will prepare a presentation to be given to the class, max 5 min., showing their graphs and conclusions. Students will present data to their parents or guardians and ask for their input, anything that they see in their graph and conclusions, include this in the presentation.

Possible questions:

What is the best way to display and why?

What do their graphs show?

Did any outliers affect the data?

Which central measure of tendency best represents their data and why?

Day 10

Presentations

PERFORMANCE PACKAGE TASK 1

(Title of Package)

Content Standard: Data Analysis, Statistics, and Probability

Level: Partial

Specific Statement(s) from the Standard:

Minnesota Standards - Represent data and use various measures associated with data to draw conclusions and identify trends. Understand the effects of display distortion and measurement error on the interpretation of data.

NCTM Standards – Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them. Select and use appropriate statistical methods to analyze data.

Product(s):

The students will gather data and display their data using an appropriate graph, then analyze their data and present their findings to the class.

Task Description:

The students will gather data on hours they've watched TV, then choose the best method to display this data. Mean, median, and mode will be found and students will differentiate between them and choose which is the best fit for their data. The students will formulate questions to help analyze and interpret their data, then come up with conclusions based on their analysis. When their analysis is finished, they will develop a written report, then present their findings to the class as a final project.

Special Notes:

At beginning of school year, have students start a journal on how many hours they watch TV each day. Make a sheet for the month and give to students to fill in, each month give them a new sheet.

If any class time is remaining on any days, activities involving graphing calculators may be used.

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>
_____	Data has been organized.	_____
_____	Appropriate method of display was chosen.	_____
_____	Measures of central tendency have been accurately calculated and analyzed.	_____
_____	Interpreted data and written report completed.	_____
_____	Report presented to class.	_____

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):