

Lab Framework

Text: CORD

Unit number and title: Unit 19 Working with Stastics

Short Description:

In this investigation, students will see the affect of using a normal distribution to calculate test scores. Information will be simulated or derived from a class set of test scores. Students will decide if the class distribution can be modeled by a normal distribution as well as describe their test score compared with the class average.

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Curving a Test

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

Guiding Qustion: "Should I curve the next test?"

Students should be able to identify unimodality, symmetry, standard deviation, spread, and the shape of a data curve to determine whether the curve could reasonably be approximated by a normal distribution.

Given formulas, student should be able to calculate the standard deviation for a small data set, but calculators ought to be used if there are very many points in the data set. It is important that students be able to describe the characteristics of the normal distribution and identify common examples of data that are and are not reasonably modeled by it. Common examples of distributions that are approximately normal include physical performance measurements (e.g., weightlifting, timed runs), heights, and weights.

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)
In depth knowledge of measures of center (mean, median & mode), variability and central tendency. Able to calculate standard deviation given a formula. Understand the characteristics of a Normal distribution.
- **Vocabulary**
See vocab. in back of student book (pg.57).
- **Materials List**
Pencil, graph paper, and normal distribution worksheet.
- **State Standards addressed**
Math (**ALGEBRA 2**): A2.6.F Calculate and interpret measures of variability and standard deviation and use these measures and the characteristics of the normal distribution to describe and compare data sets.
Reading: 2.3.4
Writing: 1.2, 2.1, 2.2
- **Leadership Skills**
Work in partners to produce a final result.

- **SCAN Skills/Workplace Skills**

Information: Acquires and uses information

A. Acquires and Evaluates Information

B. Organizes and Maintains Information

C. Interprets and Communicates Information

- **Set-up information**

Students will be using simulated test scores(%) from a unit test to determine if curving the test would be in their best interest. Students will then determine when curving a test would be in their best interests by creating a scenario and data to support their conclusion.

- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required**)

Lab activities are included below.

- **Teacher Assessment of student learning** (scoring guide, rubric)

Have students create and present a description of when curving a test score would be in their best interest...using measures of variability like standard deviation.

- **Summary of learning** (to be finished after student completes lab)

-discuss real world application of learning from lab

-opportunity for students to share/present learning

- **Career Applications**

Standardized Testing

Comparing Data

College Exams

Stock Market, Marketing Trends,

Quality control.

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LAB TITLE: Are you Normal?

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
Is there ever a situation where curving a test would be in your best interest?

- **Grouping instructions and roles**
Partner students together by ability.

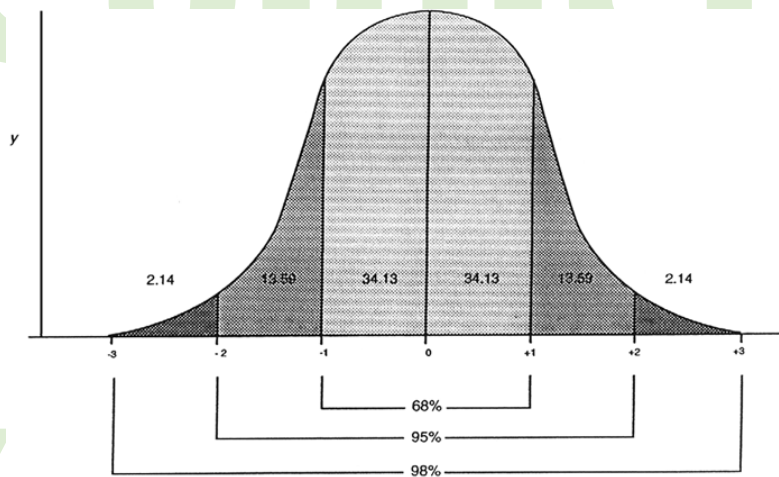
- **Procedures** – steps to follow/instructions

1. Use simulated scores from a unit test to make a frequency distribution of the data, using the intervals; 0-9%, 10-19%, 20-29%, etc...all the way to 90-100%.

64, 67, 71, 95, 54, 10, 46, 71, 88, 97, 80

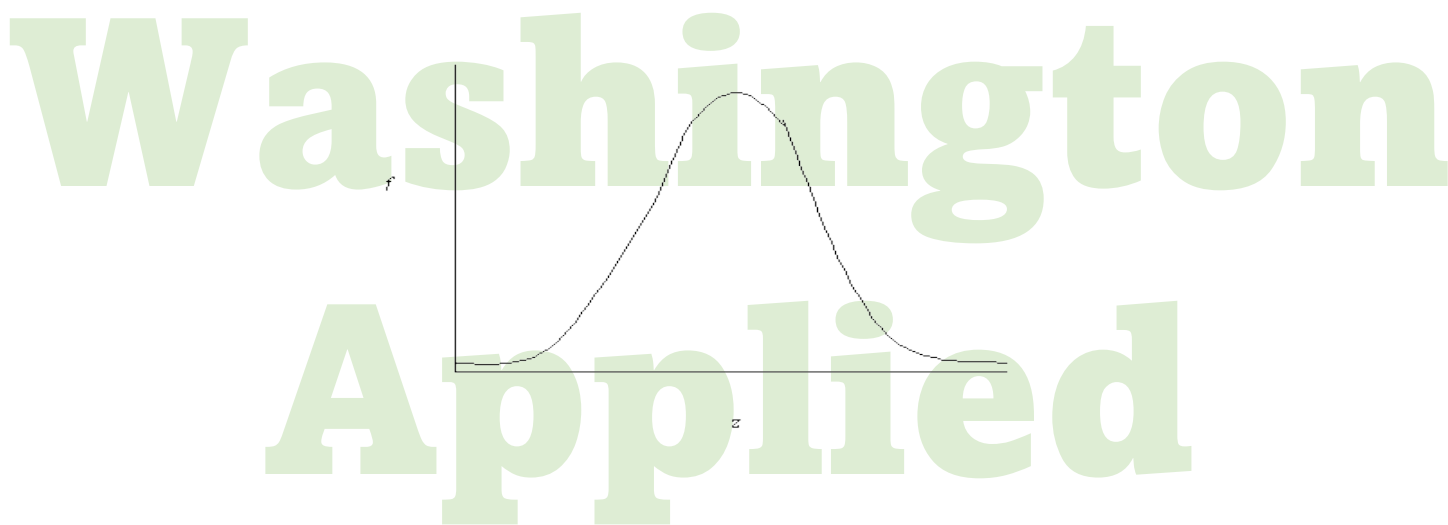


2. Based on your graph, does the class test scores appear to represent a normal distribution. Justify your thinking. Recall a normal distribution below:



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3. Create a normal distribution of the above data. Start by creating a title, determine the standard deviation, label intervals on the graph, label the mean/median/mode and finally label; hi, low, 1&2 standard deviations



4. How many standard deviations is the lowest and highest test scores away from the class average? What does this mean in terms of the class average?
5. Oops...I made a mistake. The 10% test score actually was recorded wrong, the score should actually be 100%. How would this score affect the distribution? Justify.
6. You were absent for the test and need to make it up after school today. Knowing this information about the class, what minimum score would ensure that you would earn an A?

- **Outcome instructions**

Understand./describe parts of a normal distribution

- **Assessment instructions** (peer-teacher)

On a sticky note, students will answer the guiding question and elaborate with mathematical vocabulary and understanding of a normal distribution.

1. An alternate assessment might be to challenge student to describe whether eliminating their lowest test score or median test score to represent their assessment average.
2. Another challenge may be to change the data to make earning and A impossible based on an enlarged standard deviation

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