Lab Framework

Text: Applied Mathmatics

Unit number and title: 19 Working with Statistics

  Short Description: (To assist other teachers when they are searching for a lab)

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  Contact Information: (Your contact information for clarification)

Date:

Lab Title
Tire Pressure

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

    Analyze data using central tendencies.
    Write persuasively using statistics
    Service station/do-it-yourself car maintenance

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

- **Vocabulary**

- **Materials List**

    One tire gauge per pair, Specifications worksheet

- **GLEs (State Standards) addressed**

    Math: (Math)
    Reading: (Reading)
    Writing: (Writing)

- **Leadership Skills**

- **SCAN Skills/Workplace Skills**

- **Set-up information**

    Have students measure their own car's pressure if possible. Close supervision may be needed.

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

    Teams of four, working in pairs; one 50 minute class period
    The Specifications sheet can be completed as:
    - an entire team activity (one sheet per team)
    - a pair activity (one sheet per pair) or,
    - individually (w/ each student accountable for the computations)

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

- **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

- **Optional activities**

- **Career Applications**

Washington Applied Math Council

https://wa-appliedmath.org/

LAB TITLE: Tire Pressure
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

In this unit we have been dealing with statistics and their central tendencies. Today we as a class are going to collect and analyze our own set of data. Your team of four members will form two pairs. Each pair will be responsible for collecting five tire pressure measurements (measure your own car if possible) to be shared with your team, and eventually with the entire class.

The air pressure in a tire is measured in pounds per square inch. Therefore the readings you obtain from your tire gauge must be labeled PSI.

Once you have obtained your data, you will be finding the mean, median, mode, and standard deviation of your team's ten measurements. You will also find the mean, median, and mode of the entire class' data. Once you have this information, you will be comparing the class data to your team's data looking for similarities and differences.

You will then construct a histogram with 5-6 intervals using the entire class' data and determine whether the data "fits" a normal curve.

******As a final activity, you will write a letter to Too Low Tire Company with your recommendations as to what should be the "normal" PSI of their tires. Include the analysis of the data we collected in your letter to substantiate your recommendations. (Check with your teacher to determine whether this letter will be written individually or in pairs.)

- **Grouping instructions and roles**
    Team of four in two pairs

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

Start Date:_____   **Member 4** _____
Due Date:_____   **Lab #_____**

Lab Title: TIRE PRESSURE

Record your tire pressure readings to the nearest PSI on the chart below and on the board for the class data.

Team Pair I Measurements   Team Pair II Measurements

Tire 1_____   Tire 6_____
Tire 2_____   Tire 7_____
Tire 3_____   Tire 8_____
Tire 4_____   Tire 9_____
Tire 5_____   Tire10_____

1. What is the mean of your 10 measurements?

2. What is the median and mode of your 10 measurements?

3. What is the standard deviation of your 10 measurements?

4. What is the mean of the class measurements?

5. What is the mode of the class measurements?

6. What is the median of the class measurements?

7. In comparing the class data to your 10 measurements, which of these central tendencies differ?. . .and why do you think there is a difference?

8. How does a low tire pressure affect the way your car operates and why?

9. Divide the tire pressure readings taken by the entire class into 5 or 6 convenient ranges (ex. 10-19 PSI, 20-24 PSI, etc.) and construct a histogram for the frequency of readings for the ranges you have chosen in the space below.

10. Does the data in the frequency distribution graph "fit" a normal curve?

- **Outcome instructions**

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

Lab Data Collection

Student: _____ **Date:** _____

Unit: _____

Lab Title:

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

Calculations: Complete the given calculations to solve for an answer(s)

Summary Statement:

Other Assessment(s)