Baseball Bat Testing: (Advanced)

Subjects: Math/Science

Topics: Analyzing how manipulation of graphical representations of data
can alter   the perception of what that data means.
                 The ethical implications of being able to manipulate data and graphs.

Grades: 9-12

Big Ideas: a.   Graphs can be manipulated in ways that allow you to take identical data
                          sets and alter how the data is viewed and interpreted.

Concepts: a.   Certain ethical considerations must be taken into account when you
                          decide how to set up graphs portraying data you wish to use
                          (particularly in business)
                b.   Changing the y-scale of a graph alters the appearance of the graph in
                         ways that can change how it is interpreted.
                c.   Changing the start point of the y-axis on a graph alters the appearance
                         of the graph in ways that can change how it is interpreted.

Objectives: a.   Students will plot data from a computer simulation into a data table.
                b.   Students will take data from a table and convert it into bar-graph form.
                c.   Students will take the same data from a table and represent it differently
                         by altering the starting point on the y-axis.
                d.   Students will take the same data from the table and represent it
                         differently by changing the y-scale.
                e.   Students will demonstrate how it is possible to make the difference
                         between the wood, metal, and composite bats look negligible by altering
                         graphical representation of the data.
                f.   Students will identify real-world situations where people could alter
                         graphs to suit their purposes.

Essential ?'s   a.   How does changing the starting point for distance on the y-axis change
                          how each type of bat appears to compare to one another?
                         How does changing the scale of the y-axis change how each type of bat
                          appears to compare to one another?
                         How could the concept of changing the start point on the y-axis or the
                          scale of the y-axis be used by a car salesman to make an
unreliable car   `         `   appear to compare more favorably to a competitor's?
Vocabulary: Ethics, Scale, X and Y Axis, Manipulate
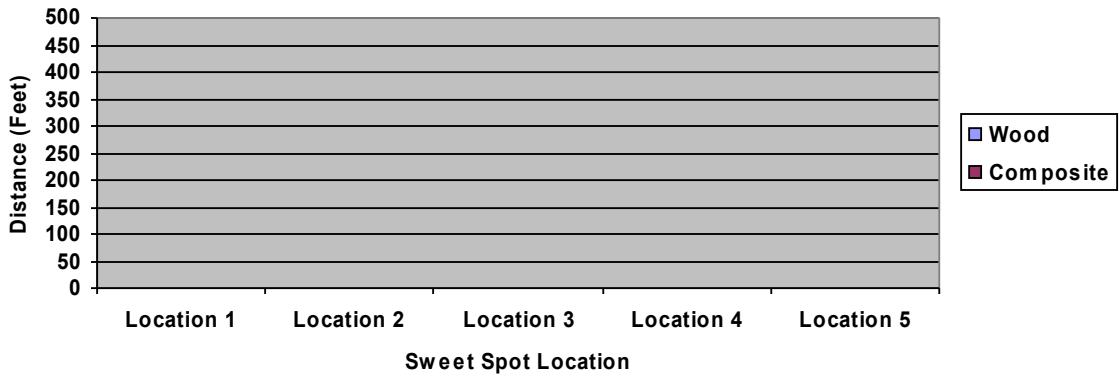
Blank Templates

Material	Length	Weight	Location	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Avg
Wood									

Material	Length	Weight	Location	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Avg
Composite									

Graph 1

Wood versus Metal Bat

Graph 2

Wood versus Metal Bat

Graph 3

Wood versus Metal Bat

Questions about the graphs: Name: _____
                                              Date: _____
                                              Class: _____

Use the graphs you created to help answer the questions below.

1.) Which of the three graphs makes the composite bat appear far superior to the wood?

   _____

2.) Which graph would you use if you wanted to convince somebody that there was very little difference between the wooden and composite bats?

   _____

3.) Create a real-life situation where somebody could take two identical data sets and manipulate the graphs to their advantage.

   _____

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4.) If a car salesman changes the starting point of the y-axis on a graph about vehicle reliability, but hasn't falsified the actual data of the graph, why might this be unethical?

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