Data Analysis

Data Analysis

The data analysis is one of the most important parts of any investigation. This is where you make sense of your results. This part is only a discussion of the data. ***Do not discuss the original question.***

- Look at your data (charts and graphs).
- Use appropriate measures of central tendency (mean, median, mode, range).
  - *Mean*: – Mathematical Average
  - *Median*: The median is the middle value of a set of data listed in numerical order. If a set of data contains an even number of items, it will have two middle numbers. In this case, to find the median, the two middle numbers are averaged.
  - *Mode*: The value that occurs most often in a set of data.
  - *Range*: The difference between the greatest number and the smallest number in the data set. Range shows how much the data set varies.
- Explain and discuss the patterns and relationships you see between the independent variable and the dependent variable. How did the independent variable affect the dependent variable?
  - *Example: The general pattern of the data shows the independent variable did/did not affect the dependent variable. When comparing the independent variable (type of system), the dependent variable (mass) decreased. Both systems lost mass, but if the system was closed, less mass was lost.* (Hint: 3rd sentence discusses pattern)
- Discuss the accuracy of the data.
  - *Example: Extraneous data (mass was gained) was noted in trials 1 and 4 and were not used in data calculations. The remaining trials were consistent in data with a low range.*
- Discuss where and why the data may be limited. (Hint: Materials)
  - *Example: The data was limited by the materials used for the systems, and the chemicals used to produce the reaction. The materials (plastic bag) did not allow for a true closed system.*

Example - Data Analysis:

The general pattern of the data shows that on average the amount of time that it took for 100 milliliters of water to perculate in the soil for the "Control" and "Control-Mulch" increased over time compared to the water perculation average of "Earthworms" and "Earthworms-Mulch" which both decreased in time. The independent variable (topsoil covering) did affect the dependent variable (soil rehabilitation). If no covering or the standard covering of mulch was used, then the time in which the water perculated through the soil increased in six out of eight trials. If only earthworms were added to the soil, then the permeability rate of the water decreased.

No consistent data was noted. Not all soils appeared to be hydrophobic. The operational definition of a hydrophobic layer for this experiment was estimated to be a water perculation rate of two minutes or greater for 100 mL of water. Fifty (50% - 8/16) of the trials by this definition were hydrophobic. Based on research, soil permeability will vary depending on the severity of the fire and the damage to the soil. The models of soil created for the experiment did appear to represent this model.

The investigation is limited to the type of soil used. Only one species of worm was used. Eight earthworms were used in 4641 cm^3 of soil. The soil was also kept moist.

Science Fair Rubric Checklist – Data Analysis

Expectations - Data Analysis	*Points*
▪ Typed/Font 12/Times New Roman/Double-Spaced ▪ Heading (5 lines) – left of page o Title "SF Data Analysis" ▪ Five or less spelling/grammatical errors ▪ No contractions ▪ Guidelines followed: o Use appropriate measures of central tendency: Mean, Median, Mode, Range o Original question not discussed o Patterns or relationships between IV and DV explained/discussed o Accuracy of data evaluated o Limitations of data ▪ Rough drafts (typed with revisions) stapled to back (left corner) ▪ Rubric stapled on front (left corner) ▪ Parent signature on typed final draft	20
SCORE	