SCIENCE FAIR

DATA & ANALYSIS

Pulling it Together

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Data analysis is the process of using tables, charts, graphs or other representations to organize and interpret data.

The ability to make inferences and predictions based on data is a critical skill students need to develop.

PARENT TIP

K-4 students can create a model or a demonstration instead of an experiment, if they wish. They are expected to be able to explain the parts of their model or how the demonstration works. If they choose to do a science experiment, data interpretation for K-4 can be as simple as how many more or less are in a category.

Analyzing Data

Review Your Data

Take some time and really think about what happened and what you discovered.

Ask Yourself These Questions

- **Is your data complete, or did you forget something?**
- **Do you need to collect more data?**
- **What is the best way to summarize the data?**
- **Do you need to calculate averages or percentages or something else?**
- **What type of graph would be best to display my data?**
- **Do you see any patterns?**

Calculating & Summarizing Your Data

CALCULATIONS: Perform any calculations that are necessary to analyze and understand your data.

Use known formulas that describe the relationship you are testing, such as:

- Density = mass ÷ volume or D=m/v
- Speed = distance ÷ time or S=d/t
- Force = mass x acceleration or F=ma

SUMMARIZING: You probably have a lot of data after completing multiple trials of your experiment. Think about the best way to summarize your data.

Calculate the average for each group of trials

- Average or Mean – the central value of a set of numbers
- An average is calculated by adding all of the numbers in the data set, then dividing the sum by the number of trials.

Calculate percentages

- Percentage literally means "per 100 pieces"
- A percentage is calculated by dividing the part by the whole then multiplying by 100.

Express the data as ratios

- A ratio shows the relationship between two quantities. It is a comparison of how one number compares to another number.
- Ratios can be expressed in the following formats: A/B, A to B, or A:B

Display all data as individual data points

Graphing

Graphs are often an excellent way to display your results.
There are 3 main types of graphs or charts that you might use:

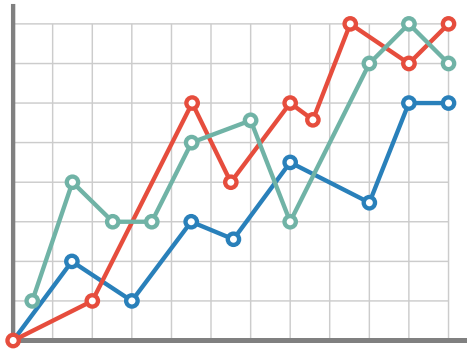
Pie Charts

Show percentages of a whole

Line graphs

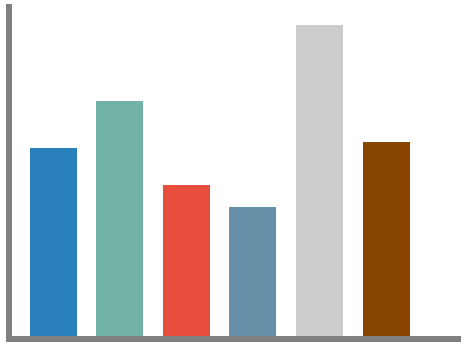
Can show changes over time

Can show how one variable (DV) changes due to the change of another variable (IV)



Bar graphs

Compare facts or data



D-Tails

D-TAILS is an acronym used to help you remember everything you need to create a successful graph.

D **Data** covers at least 50% of the graph area and is accurately placed

T **Title** in the form of: "The effect of IV on DV"
Ex: The Effect of Sleep on Quiz Scores

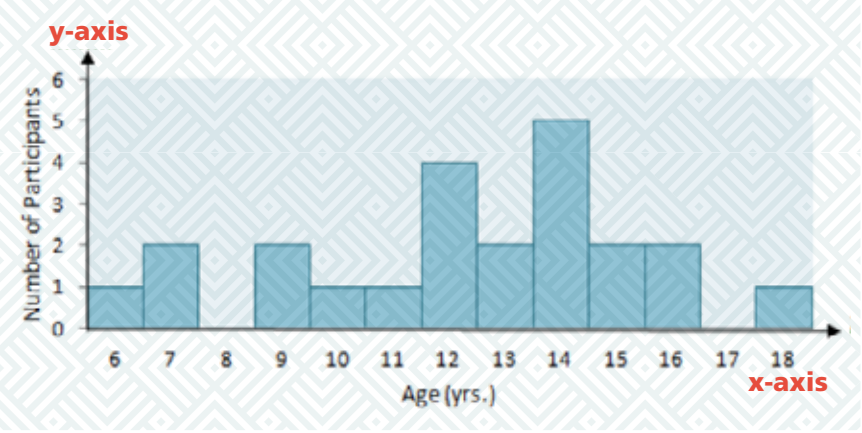
A **Axis** labeled as follows:
Independent (what you change) is always on X axis (horizontal)
Dependent (what you measure) is always on Y axis (vertical)

I **Interval** uses consistent spacing between one number and the next on the scale. Pick the interval that makes sense!

L **Label** units in parentheses after the axis label
Include proper units (if there are units)

S **Scale** should NOT change along an axis
Ex: 1, 2, 3, 4 or 0, 5, 10, 15 NOT 1, 2, 7, 20

The Effect of Age on Science Fair Participation



Be sure to visit our website at
clermontlibrary.org/science-fair
for more resources and information on this and other components of creating a Science Fair project.

All Science Fair project proposals must be submitted through the registration form on the website by the deadline stated on the form to be considered for inclusion in the Library Science Fair.

Questions? Email us at:
sciencefair@clermontlibrary.org

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