# Analyzing Your Results

A Science Fair Foundation BC

STEM Workshop

## The Scientific Method

1. Ask a Question
2. Do Some Research
3. Make a Hypothesis / State your Objective
4. Test Your Hypothesis / Objective
5. **Analyze Your Results & Form a Conclusion**
6. Tell Others About it!

## Why Is It Important to Collect and Analyze Data?

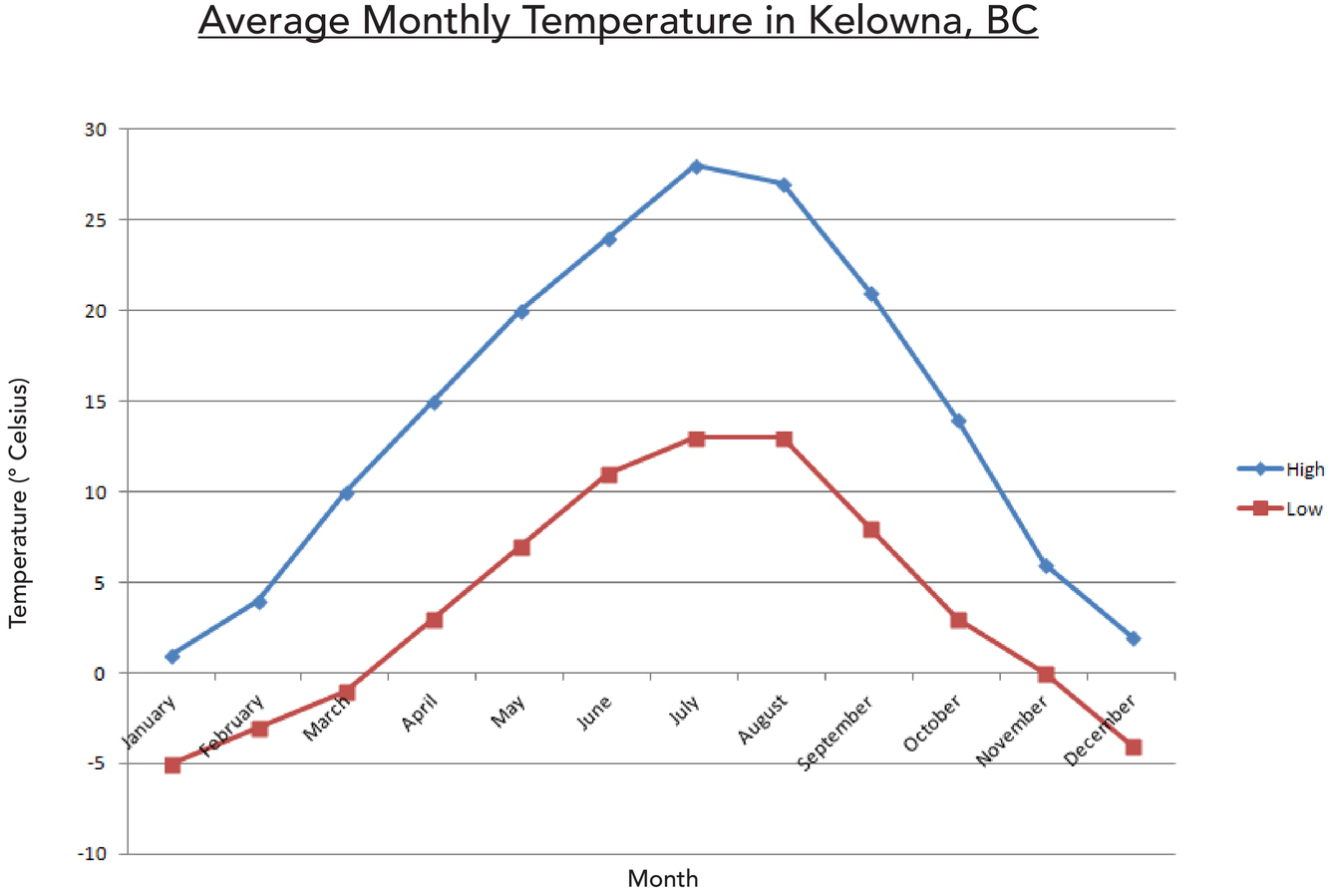
- To provide evidence that proves (or disproves) our hypothesis
- Without data and evidence, our hypothesis is just a prediction to be verified
- Data is impartial as long as a good scientific method is followed. By collecting data, we get information that is not influenced by what we feel or want
- Analyzing data can:
    - Show us relationships between our variables
    - Show us trends or recurring patterns
    - Show discrepancies or anomalies
    - Reveal something we weren't expecting

# Converting Your Data

Converting our raw data into charts and graphs allows us to more easily see relationships, patterns or discrepancies within our data

This line graph shows the relationship between the time of year and the average temperature in Kelowna, BC. The average temperature goes up as we approach summer, and down as we approach winter.

From these relationships, patterns or discrepancies, we can then interpret the meaning of our data, and explain how it relates to our hypothesis/the real world (deciding what clothes to pack if we vacation in Kelowna in June).



# Raw Data vs. Processed Data

## Raw Data

Raw data is the data you collect directly from a source, such as survey answers or results collected from an experiment.

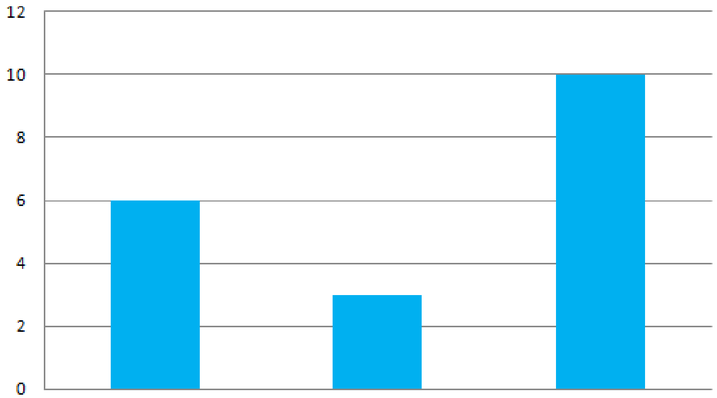
Raw data is unorganized and often contains too much information to interpret on its own. It could also contain anomolies, duplicates or errors that may need to be addressed.

## Processed Data

Processed data is raw data that has been cleaned, organized and formatted to help us understand and interpret the data we've gathered.

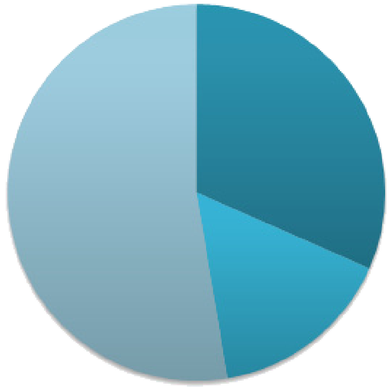
How we decide to process our data depends on how we want to use it. Using graphs and charts is a simple way to reveal trends, show relationships, and present our findings to others.

## Charts and Graphs



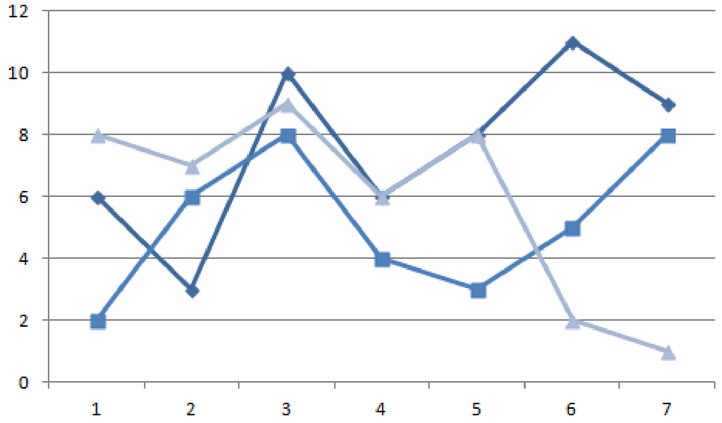

*Bar Graph*

- good for comparing different trials/ groups
- good for projects where one variable is not a number
- good for tracking changes over a period of time



*Pie Chart*

- good for showing a ratio/percentage of things that make up a whole
- depict a single point in time (not changes over a period of time)




*Line Graph*

- good for showing relationships between two variables when both are numbers
- show continuous data over a period of time, therefore good for showing change over time

## Interpreting Your Results

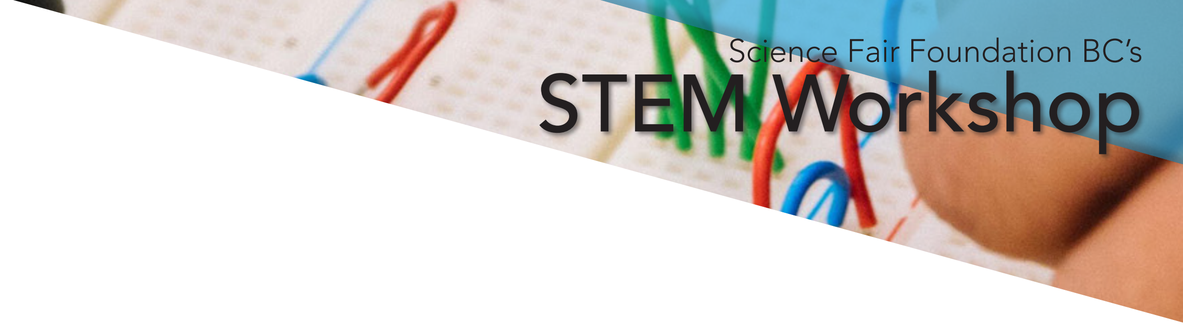
- What are the data telling me?
- What patterns/relationships do I see? What do they mean?
- How are these results related to my hypothesis? Do these results support or disprove my hypothesis?
- If your project is an innovation, do your results mean your project met its design criteria?
- How do these results relate to the wider world/environment?
- Looking back at your controlled variables (did we *actually* control them? can we be certain?), are your trials similar to each other? Are the trials different, and if so, how much and why?

## Summarizing Your Results

- Summarize your data, graphs and charts, and what they mean (tell a story using your data)
- Answer whether your data supports or disproves your hypothesis
- State the relationship between your independent and dependent variables (if applicable)
- Evaluate your procedure and comment on its successes and effectiveness
- Suggest changes to your procedure that would make it more effective
- Discuss next steps and how to expand on the knowledge you gained from this project

# Upcoming Programs

From Science Fair Foundation BC



Science Fair Foundation BC's

## STEM Workshop

### STEM Workshops

*"What's a STEM Project?"*
October 12th, 2021

*"Why to How:*
*Understanding the Scientific Method"*
November 9th, 2021

*"Understanding Ethics & Safety"*
December 7th, 2021

*"What Does an Awesome STEM Project Look Like?"*
January 18th, 2022

*"Analyzing Your Results"*
February 15th, 2022

*"Communication:*
*Reports, Presentations, Interviews"*
March 15th, 2022

### Mentorship Program

Have a question about your STEM project? Not sure what your results mean? Looking for expert advice on your specific STEM topic? Our Mentorship Program connects students across BC and the Yukon with science fair organizers, science fair alumni, scientists and industry experts to help in the development of their STEM projects. Send in your question using the webform on our website and get an answer from a mentor whose background best fits your subject matter.

- Available now until mid-April, 2022

- Email access to experts in your area of interest

- Get help during any phase of your project

- Go to www.sciencefairs.ca/ask-for-help/mentorship

### Sweatin' for Science 2022 | Space Edition

Sweatin' for Science is Science Fair Foundation BC's annual fitness fundraiser to support youth across BC and the Yukon in their discovery of science, technology and innovation. Pick your favourite activity, form a team with friends, and join us for the month of May when we start Sweatin' for Science.

- General registration is open. Get your tickets!

- Event dates: May 1 to May 30

- Win prizes for top distance and top fundraiser

- Go to www.sciencefairs.ca/sweatinforscience

*Find out more at www.sciencefairs.ca, following us on social, or subscribing to our newsletter.*