Overview of a Science Project

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What is a Science Project?

- A science fair project is an experiment, investigation, or construction of models **that is designed to solve a problem or answer a question.** It is a 'science' fair project because you use a procedure called the scientific method to answer the question.

- The 'fair' part takes place when everyone who has done a project gathers together to showcase their work

WHAT MAKES A GOOD PROJECT?

- Something you are interested in
- It can be investigated
- It has value because we don’t already know the answer
- Based on Science

What are your Project Ideas?

Topics to Avoid

- What Colour is Nicer?
- Tigers
- How does a Volcano work?
- Which kind of battery is best?
- Does having a bath in the morning make me a better person
- Creating Power from a Citrus Fruit
- Is Molasses harder to pour when it is colder?
- How does adding Vinegar affect the growth of a plant?

Topics to Avoid

- What Colour is Nicer? **Opinion**
- Tigers **Research/Not Testable**
- How does a Volcano work? **Demonstration/Already Know**
- Which kind of battery is best? **Opinion**
- Does having a bath in the morning make me a better person **Not Science**
- Creating Power from a Citrus Fruit **Demonstration**
- Is Molasses harder to pour when it is colder? **Already Know**
- How does adding Vinegar affect the growth of a plant? **Wild Idea**

WHAT IS A SCIENCE FAIR PROJECT?

Scientific Method - Skills

- Testable Question
- Research
- Hypothesis
- Procedure and Design
- Results
- Conclusion
- Next Steps

Skill - Testable Question

- Must include a **variable to manipulate** and a **variable to measure**…

Skill - Testable Question

- Must include a **variable to manipulate** and a **variable to measure**…

- Does the **type of ball** affect **how high it will bounce?**

Skill - Research

- Avoid **just** using google search results

- ask.com, wikipedia.org, are opinions by people and cannot be trusted, but are great starting points

- Trust sites that end in .edu, .gov, .gc.ca, .org…

- **You can do a google search for your topic. If you select** wikipedia.org**, check the sources and read beyond that one site.**

Skill - Hypothesis

- This is Not a guess
- It is your predicted answer to the testable question
- You must provide justification (from Research or previous learning on the subject)
- If…Then…Because

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- If…Then…Because
- **If** I bounce each of the balls, **then** the golf ball will bounce higher than the sponge ball. **Because** the golf ball is harder then the sponge ball and that will make it bounce higher.

Skill - Procedure and Design

- Procedures are the set of steps that you design
- Like following the a recipe in a cookbook
    - List of Materials
    - List of Steps to follow
- These must be repeatable…not only by you but by others

Skill - Procedure and Design

- **<u>Experiment Design Tips</u>**
  - Repeatable
  - 3-5 trials
  - Test only ONE Variable (How high it will bounce)
  - All Other items must be Controlled (stay same)

Skill - Fair Test

- Designing a Fair Test - What you do to one you do to the other…
- One Variable to Test (How High Will the Ball Bounce)
- Controlled Variables
    - how the ball is dropped, what surface it is dropped on, the room, the height it is dropped from, who drops is…

Skill - Results

- Quantitative Data - using numbers
- Qualitative Data - using words to describe what you see.
- **Numbers are King**

Skill - Results

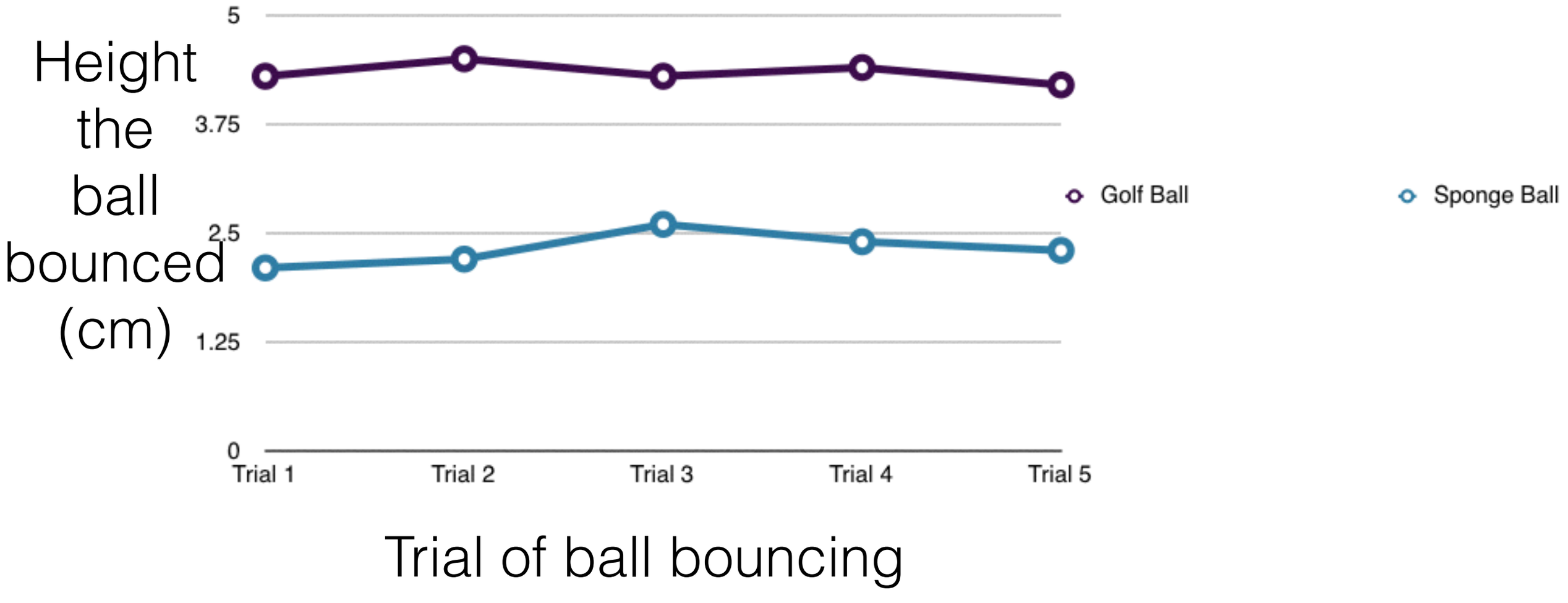
- Qualitative Data (words)
  - The Golf ball bounces higher
- Quantitative Data (numbers)

Trial #	Golf Ball Height	Sponge Ball Height
1	4.3cm	2.1cm
2	4.5cm	2.2cm
3	4.3cm	2.6cm
4	4.4cm	2.4cm
5	4.2cm	2.3cm
Average	4.34cm	2.32cm

Skill - Results

- Graphs - y axis (Variable your testing) x axis (variable you are manipulating)

Height the ball bounced



Skill - Conclusion

- Must answer your initial question
- Hypothesis - supports or refutes the claim
- Give Evidence from what your data shows

Skill - Conclusion

- Must answer your initial question
- Hypothesis - supports or refutes the claim
- Give Evidence from what your data shows
- “The type of ball does affect how high the ball will bounce. My claim that the harder the ball is the higher it will bounce supports this concept. Because the golf ball bounced an average of 4.34 cm while the sponge ball bounced an average of 2.32cm”

Skill - Next Steps

- Key Skill that is often overlooked.
- Now that you have learned this…whatever it is… what are you going to do with it?
- New Question to Test
- New Way to view this
- New application in the real world

Questions…