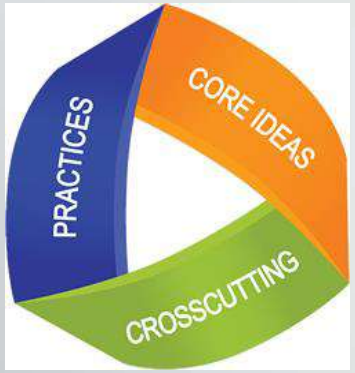
Science and Engineering Fair Parent Presentation

2018

Why a Science Project?

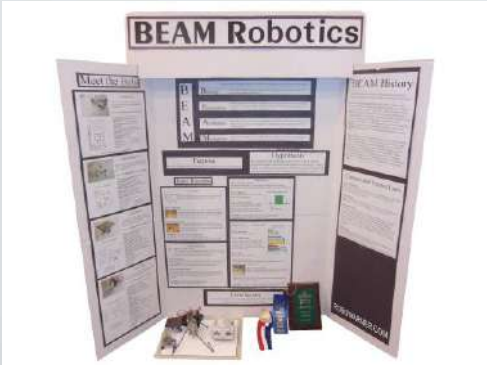
- Part of the Science and Engineering Practices in Next Generation Science Standards (NGSS)



  - -Planning and carrying out investigations (SEP-3)
  - -Constructing explanations for Science and designing solutions for Engineering (SEP-6)
  - -Obtaining, evaluating, and communicating information (SEP-8)

- It is cross-curricular and meets English Language Arts Standards: Reading for Information 4.8, 5.8, 6.8 and 4.9, 5.9, 6.9.

Compete or Not Compete



- All 4th, 5th, and 6th grade students will complete a project.
- Students will have the option to submit their project for competition.
- Students who choose NOT to Compete will have a different packet of information. They will have alternative choices to present information.
- We encourage all students to compete.

Team Projects-Different Grade Levels

1. Teams will consist of no more than 3 members.

2. Only one backboard is required per team. (non-competing projects may differ)

3. Each student should have a separate Research Report folder. The written 1-3 page research page, included in the Research Report, should be different. Each paper should be relevant to the grade level of that student. Bibliographies and table of contents also might be different. Materials presented on the backboard or in the presentation, such as title page, and acknowledgement page, can be duplicated in both reports.

4. IN A CROSS GRADE-LEVEL SCIENCE PROJECT, THE PROJECT WILL BE JUDGED AT THE HIGHER-GRADE LEVEL.

5. Students must have two separate journals: Information may be similar.

Team Projects-Same Grade Level

1. A team may consists of no more than 3 members.

2. Only one backboard is required. (for those competing)

3. Only one journal is required, however, students may want to keep separate journals, so they may personalize their notes, observations, research, and questions.

4. Only one research report is required, including 1-3 page research paper and copies of items on the board or in the presentation. Also include a table of contents, bibliography, title page and acknowledgement page.

Engineering vs. Science

- Design requirements
- Evaluate possible solutions
- Create a prototype
- Test and redesign
- Sketches, diagrams, and detailed drawings
- Engineering projects now accepted!
- No “hypothesis” or “procedure”

Tricks and Tips

- Due Date is January 28th
- Space-out the project. Don't try to do it all in one weekend
- First time? Keep it simple!
- It's supposed to be fun
- Check the timeline often
- Get a backboard now
- Engineering projects now accepted!

Aspects of a Science Projects

Science Project

- Tests a hypothesis
- Has measurable data that can be gathered
- Student is curious about the results

First Steps…

Choose a question/purpose

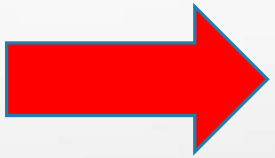
- Start with the branch of science your child is interested in
- Narrow it down
- Focus on their natural questions
- Make sure what you're asking can be MEASURED

Example: The purpose of this project is to find out if a pea plant will grow taller when given caffeine rather than water.

First Steps…

Conduct Research – Create Hypothesis

- Google it with your child
- Show them how you would take notes
- Go to the library and get a book
- Then refine your question
- After the research, have your child answer the question in a hypothesis



Develop 3 questions that you want to answer about your topic.

Try to use various sources for your research.
Suggested sources:

- *Books*
- *Magazines*
- *Newspapers*
- *Internet*

Hypothesis

Make Your Guess

- Use your research to make an educated guess about how you think your experiment will turn out.

- Use the " If I _____ then I think _____"format

Example: If I pour 100ml of coffee on four pea plants and pour 100ml of water in another four pea plants, then I think the plants with coffee will grow taller because caffeine will stimulate the plants.

Designing Your Experiment

- Design your experiment so that they only test for one thing.
- Make sure that you do the same things to all groups of objects being tested.

Procedure

- Step-by-step of the experiment
- Must be "repeatable"
- Please don't start step 1 with "get a pencil and a paper"
- Aim for exact language

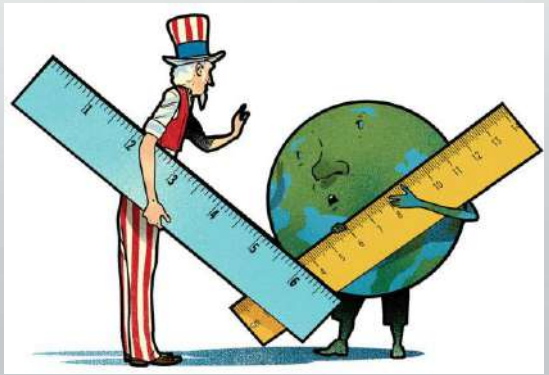
Example of Procedure

1. Get 8 pea plants (100 cm tall).
2. Place 4 pea plants on each tray.
3. Label one set of plants “Caffeine”.
4. Label the second set “Water”.
5. Pour 100ml of coffee(with caffeine) onto the soil of each plant twice a week.
6. Pour 100ml of water onto the soil of each plant twice a week.
7. Measure each plant with a metric ruler
8. Record data in record book.

List of Materials

- Make a complete list of everything you will use in your experiment
- Tell how many and how much of each material used

- Use metric measurements
- Put it in a list

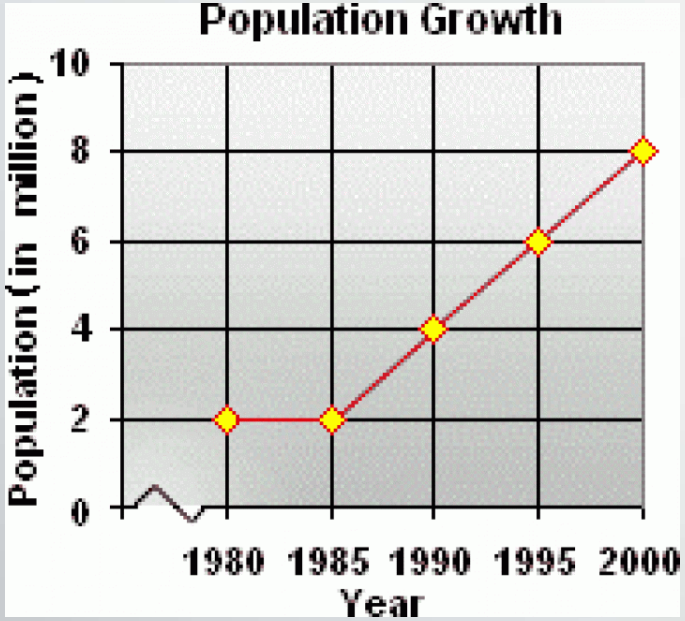


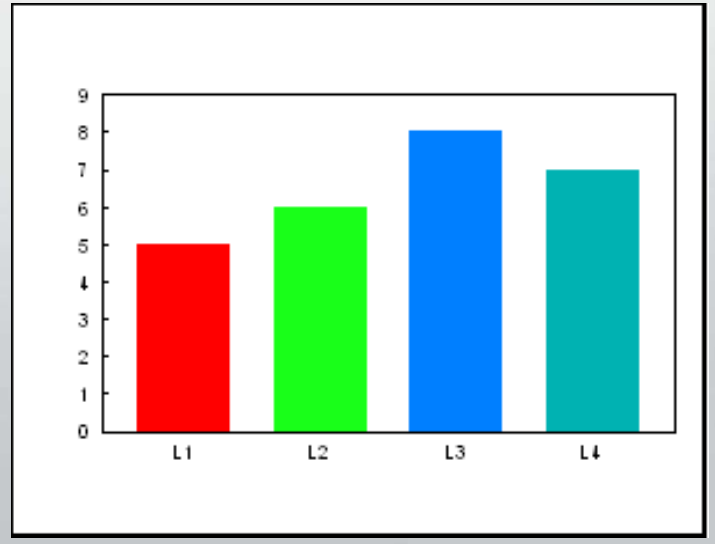
Use grams not pounds

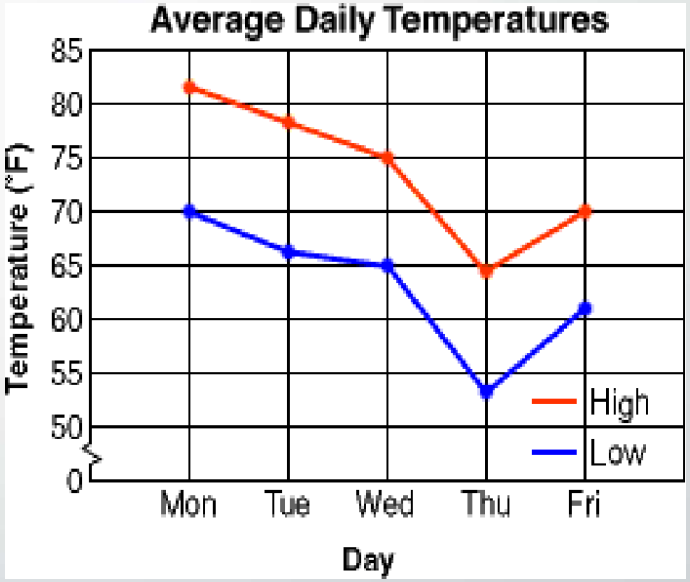
Use liters not gallons and teaspoons

Use meters not feet and inches

Display Data Using Charts, Tables, and Graphs







Don’t Forget the Journal!

- The journal is a handwritten notebook describing everything that was done in the experiment.
- It is written in the form of a diary marked with the dates and times.
- It includes descriptions by the five senses, as well as thoughts.

Then Comes the "Write-Up"

- Print out photos of the experiment – keep your kid's face out of it!
- Help them create graphs. The experiment should have been "measured," so there should be numbers to graph.
- Write a small paragraph about the graph, explaining it. This is called "Analysis of Data."
- Write a conclusion. What were the results of the experiment? If you had to do it all over again, what would you change?
- Write an abstract. This is a summary of the report.

Conclusion

Write down why you think your experiment turned out the way it did, include if your hypothesis was supported or not.

- Be sure to use the term " My hypothesis was/was not supported
- Do not say I was right/wrong
- Even when your hypothesis was not supported you gain information about your topic
- Use scientific reasoning for conclusion
- Tell how you might take your experiment to the next step

Example:
My hypothesis was supported. The plants that were watered with coffee (caffeine) grew taller than those that were given water. Therefore, caffeine has a positive effect on the growth of pea plants. This may be due to the fact that caffeine is a stimulant. The caffeine could have stimulated the plant to grow. Next time I try this experiment, I would…

But Wait! There's More…

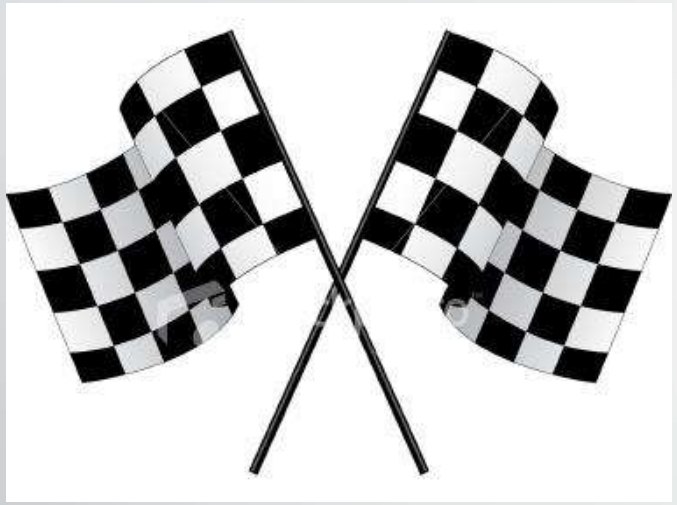
Research Report

- 300 – 500 words about what other scientists have already found out about their subjects
- Cite 3-5 references to outside sources in their report
- Use introduction, body paragraphs and a conclusion

Bibliography & Acknowledgments

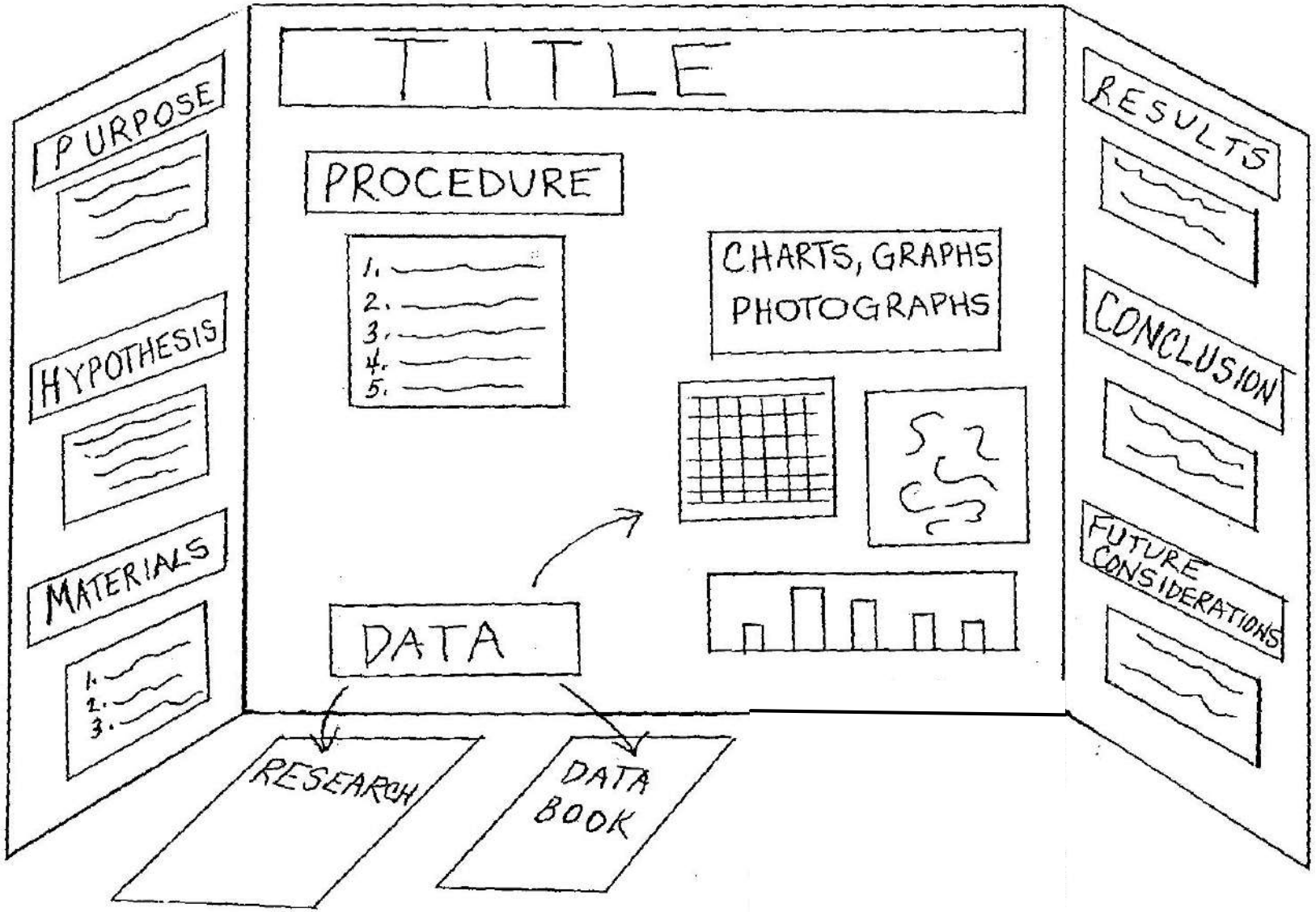
- Make sure the bibliography is formatted properly
- Make sure they write a page thanking you for your hard work

…And For the Finishing Touches…



- Type the report
- Design the display
- Practice the presentation
- Prepare for questions

SCIENCE FAIR BOARD FORMAT



Questions? Comments?

- Contact your child's teacher
- Email: david_ries@chino.k12.ca.us or heidi_gross@chino.k12.ca.us