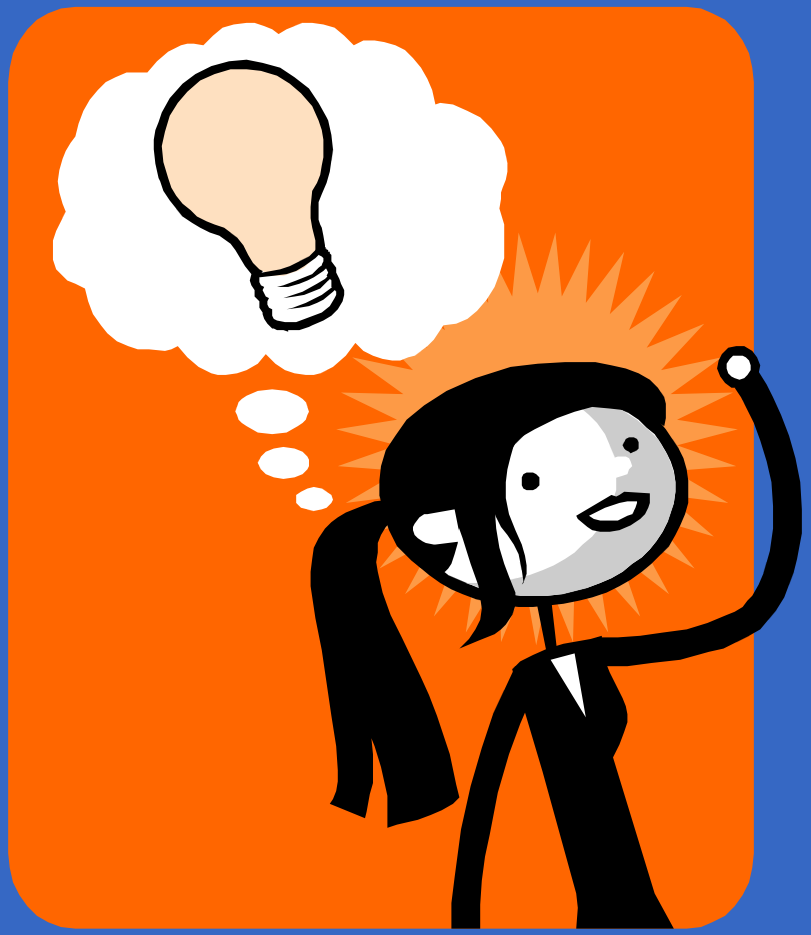
Athens-Chilesburg Elementary Science Fair

January 11, 2018
8:00-12:00

Step 1: Brainstorm Ideas



Ideas

- Look at science categories and choose one you are interested in.
  - For example: Botany (the study of plants)
  - Use experiences:
    - Have you ever asked:
      - I wonder how that works?

        OR
      - I wonder what would happen if I tried…?

Ideas, Continued

- Use current events:

  - People in Africa are hungry because of drought conditions. **A project on plants that grow well with little amounts of water.**

  - **Oil spills: How do we** clean them up? ***A project testing different ways to remove oil from water.***

Ideas, continued

- Watch commercials on television.
  - Test their claims.
    - Do Hot Wheels brand cars go faster than other brands?
    - Is bottled water better for you than tap water?
    - Do Energizer batteries last longer than Duracell?

Step 2: Develop a Question

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- State the problem you want to investigate in question form.

  - What material is the best insulator?
  - What effect does acid rain have on plants?
  - Which diaper will absorb the most water?

Step 3: Develop a Hypothesis

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- **The student predicts what they believe will happen before doing the experiment.**
  - Predictions need to match the question.
  - Whether or not the results of the experiment support the prediction does not affect judging!
  - Many winning projects show that results surprised the student.

Step 4: Identify the Variables

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- Independent variable: (manipulated variable) the one thing you plan to CHANGE on purpose in the investigation.
- Dependent variable: the MEASURABLE OUTCOME; this variable is the result of what you changed in the investigation. (It's the responding variable)
- Controlled variables: (variables held constant) everything else in the experiment must be kept the same.

Examples of variables

- **Question: Does fertilizer improve plant growth?**
- **Independent variable**
  - The amount of fertilizer.
- **Dependent variable:**
  - How tall the plants grow.
- **Controlled variable:**
  - Amount of water given to each plant.
  - The container each plant is growing in.
  - The amount of sunlight.
  - The mixture of soil.
  - Temperature of the room.

Step 5: Plan the Experiment

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- Write a step by step procedure of how the experiment will be conducted.
- List and gather the needed materials.
- Decide how you will record data. (photographs, charts, measurements, etc.)
- Start an experiment log. Bring journal on day of the fair.

Step 6 : Conduct the Experiment

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- Follow your procedure.
- Collect data (daily measurements of how tall our plants are growing)
- Record observations in a notebook or binder.
- Be sure to conduct at least 3 trials.

Step 7 : Graph Your Results

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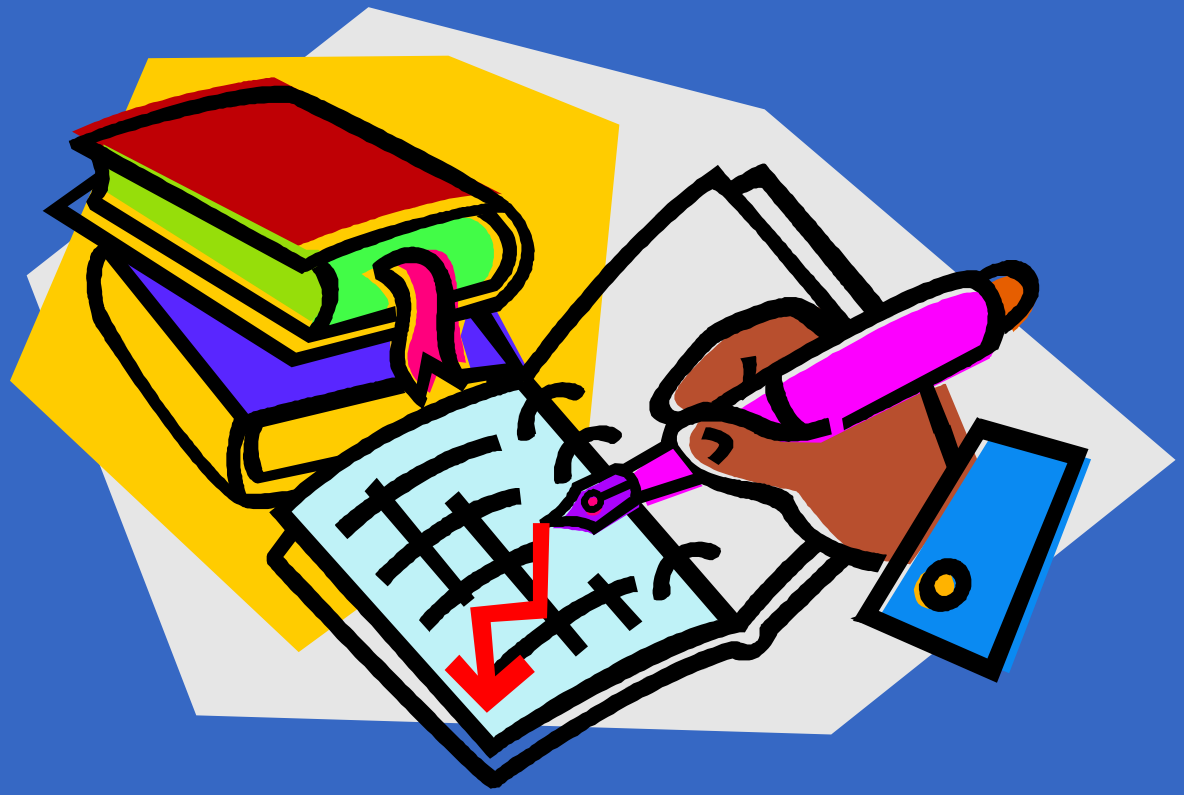
- All experiments must have a graph to show their results.
- This allows someone to see the results of the experiment quickly and clearly.
- Graphs may be in the form of a bar graph, line graph, circle graph, the graph best suited to display results.

Step 8 : Write a Conclusion



Step 8: Write a conclusion

- **Before** writing a conclusion, be sure to carefully **examine all data** (graphs, charts, tables, etc.)
- **Ask yourself these questions:**
  - Did you get the results you expected to get? If not, how were the results different?
  - Were there any unexpected problems or occurrences that may have affected the results of my investigation?
  - Do you think you collected sufficient data? (Were there enough trials? Samples?)
  - Do I need to revise my original hypothesis? (If you write a revised hypothesis, DO NOT use it to replace the original hypothesis for this project.)

Step 9 : Make a Display

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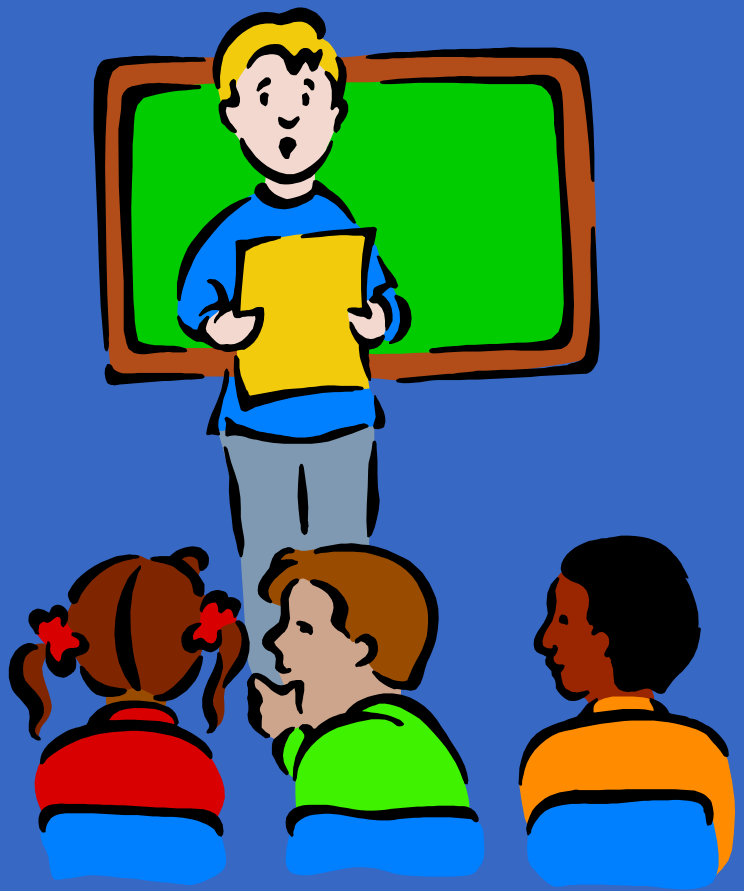
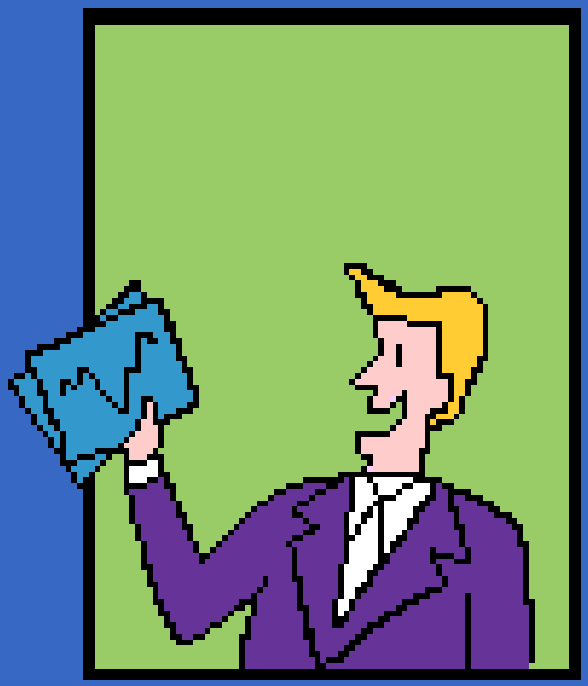
- Displays should include the following items:
  - Title
  - Purpose
  - Hypothesis
  - Procedures
    - (materials, variables, step-by-step directions)
  - Data
  - Graphs
  - Conclusions
    - The board my also include photographs and anything that will enhance the display.

Step 10 : Practice for Interview



Step 10: Practice for interviews

- Get an adult to ask questions about your project and be sure you can clearly and thoroughly answer questions relating to your experiment.



Parents of advancing projects will be notified prior to the awards ceremony

- Science Fair Awards on the following day following