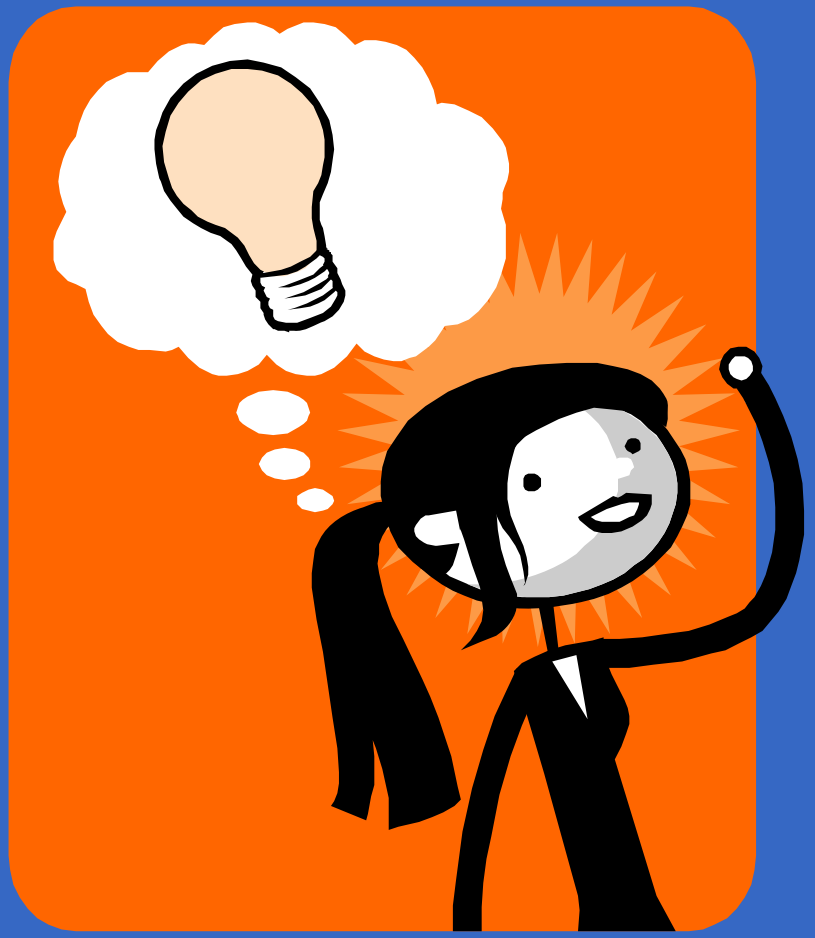
Developing Ideas and Projects for Your Elementary School Science Fair

Step 1: Brainstorm Ideas



Ideas

- Look at science categories and choose one you are interested in.
  - For example: Earth Science (the study of soils, rocks, water and weather)
  - 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?
    - Does one hand soap clean more effectively than another?
    - 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 oil have on the watering plants?
  - What is the effect of decreasing temperatures on a balloon?

Step 3: Develop a Hypothesis

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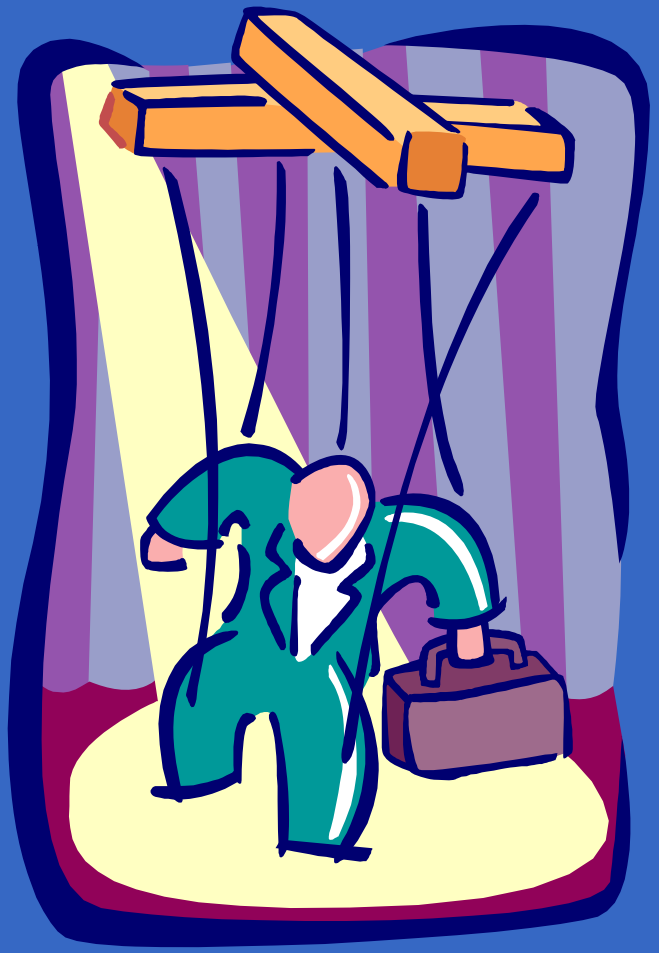
- **The student predicts what they believe will happen before doing the experiment.**
  - Predictions need to match the question.
  - Whether or not the results of the experiment support the prediction does not affect judging.
  - Many winning projects show the results surprised the student.

Step 4: Identify the Variables



Step 4: Identify Variables

- Independent variable: (manipulated variable) the one thing you plan to change on purpose in the investigation.
- Dependent variable: (responding variable) the variable that changes by itself because you changed something in the investigation.
- 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.

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, etc.

Step 8 : Write a Conclusion

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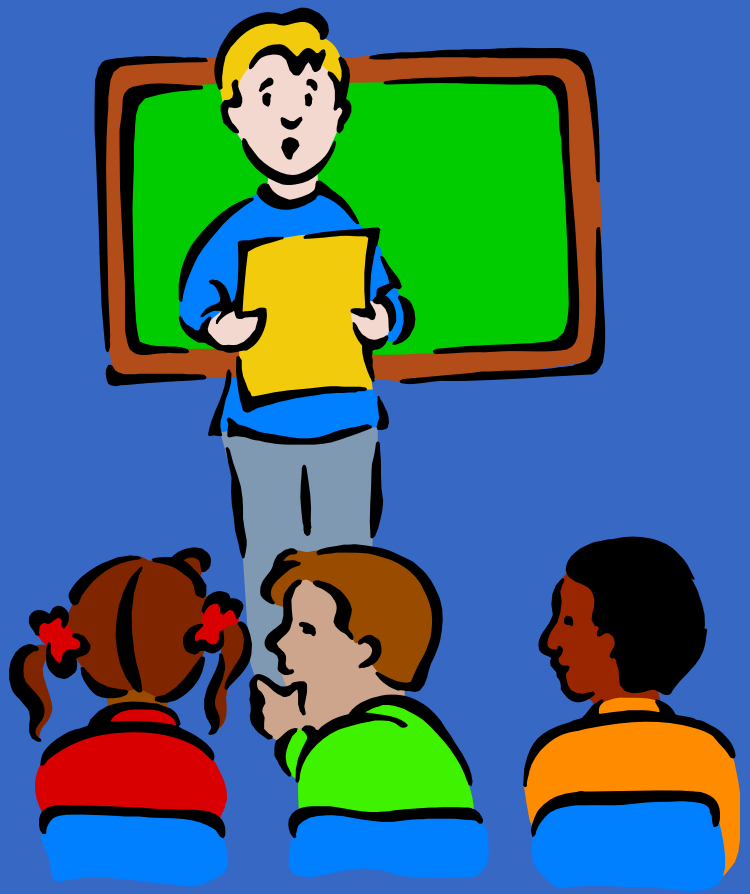
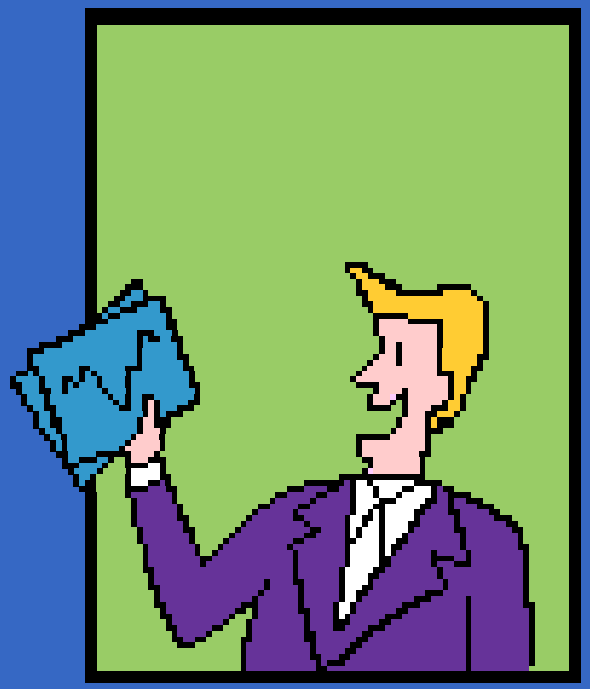
- **Displays should include the following items:**
  - **Title**
  - **Purpose**
  - **Hypothesis**
  - **Procedures**
    - (materials, variables, step-by-step directions)
  - **Data**
  - **Graphs**
  - **Conclusions**
    - The board my also include photographs and anything that will enhance the display.

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.



- Participate in your elementary school's Science Fair
- Parents can volunteer too!


THANK YOU


Gracias


Thanks