SCIENCE FAIR GUIDELINES

Project Guidelines:

1. All work should be done by the student. Your teacher, parents, or others may provide appropriate assistance.

2. Food samples (liquid or solid) should NOT be part of your display (but may be part of your project). Please use photographs or drawings, plastic food or the labeled containers.

3. Valuable equipment and live animals should NOT be part of your display (but may be part of your project). Please use photographs or drawings to document their use during your experiments.

4. Projects using live animals must follow the Science Fair Guidelines set by the State Humane Association and the MARSEF rules. See me to get more information, if your project will involve using live animals, this includes human test subjects.

5. Displays that use battery or electrical power may not be connected for your display. You may display the equipment as long as it has been disabled. Batteries (of any size) cannot be part of your display if they can be hooked up.

Please keep in mind:

Judges will be looking at the following characteristics in these projects (not necessarily in this order):

❖ Originality – Has this been done before?
❖ Good Scientific Procedure-
  ❖ Do the experiments provide the quantitative information needed to answer the student’s question?
  ❖ Have the students carefully recorded and analyzed the data?
  ❖ Have the variables been identified/controlled?
  ❖ Are the conclusions valid?
Personal Value – Is the students’ project and research of value to the students?
Simplicity – Does the project look too complicated or expensive?

DISPLAY BOARD GUIDELINES:

THE MEASUREMENTS OF YOUR DISPLAY MAY NOT EXCEED:
30" DEEP, 48" WIDE, and 36" HIGH

Your project will be surrounded by many others, so it should be attractive and have eye appeal. Remember the “C’s” for exhibiting:
- Color appeal
- Contrast
- Clear, concise statements
- Completeness

Prepare a background which is a pleasing color (paint or cover with paper) and use contrasting lettering (lettering can be done by hand or by using stencils, or may be stick-on or glue-on letters).

Your exhibit should tell the story of your project. Include the Question, Hypothesis, Materials, Method, Results, and Conclusions using simple statements and attractive visuals. Your display must have (A) pictures or sketches AND (B) a properly labeled graph of your data.

If you used special equipment, the set-up should be placed in front of your display or in a place to enhance the exhibit - not overwhelm it. Live animals should NOT be a part of your display, but may be shown by using a picture or sketch. You may not display anything that can be eaten or requires electricity.

MAKE SURE YOUR NAMES DO NOT APPEAR ON THE EXHIBIT

DISPLAYS ARE DUE Friday

NO EXCEPTIONS
All parts of your board must be word processed. If you do not have access to a printer, make sure you leave adequate time to e-mail to your teacher for printing or use the library's printer.

Font sizes and font styles are your decision. REMEMBER – you should use ALL of the space on your display board AND do not make the font too small as many of the judges wear bifocals and have already worked a full day: they do not want to struggle with type that is too small.

Please get help on spelling and punctuation. Nothing ruins a project faster than poor grammar and spelling errors. Have someone proofread before you glue your final project.

TITLE - Center your title in the middle section of the board. Use a font that is ‘eye-catching’. You may use a ‘cute, catchy’ title BUT YOU MUST INCLUDE the correct scientific title. It should read ‘The Affect of IV on the DV, The relationship of the IV to the DV, etc. Headers are not allowed.

ABSTRACT – This should be the LAST part of your project written. It is a brief summary of the entire project. It needs to be limited to 3 paragraphs, each with a SPECIFIC purpose. Paragraph 1 is what the project was about. Paragraph 2 is a summary of the procedure. Paragraph 3 is a summary of your results and conclusions.

QUESTION & PURPOSE & HYPOTHESIS – State them in 1 sentence each. Use the formal hypothesis format with both variables checked and double checked for accuracy.

EXPERIMENTAL DESIGN DIAGRAM – This is a table that tells about the parts of your experimental set-up. It allows you to organize your results for each trial and gives your variables, controls, and constants. A well designed experiment will have several levels of the independent variable being tested and MANY trials for each group (one or two trials for each group IS NOT enough). This table needs to be created on a computer, NO HANDWRITTEN tables. This table should organize your entire experiment so the reader knows how you organized your project.

INTRODUCTION – Explain how and why you chose this project. This is the only section of the project where you can use personal pronouns. Include any background research that relates to your topic. Also explain what importance the experiment has to you. Be sure to restate your hypothesis from your experimental design diagram. The Introduction should be no longer than one page.

MATERIALS – List materials vertically and BE SPECIFIC! Do not number your list but you may use bullets. Include details about quantities used and measurements. The reader should be able to take your list of materials to the store and get EXACTLY what you used on your project. ‘Water’ needs to be tap water, well water, distilled water, sparkling water. ‘3 containers’ needs to be 3 plastic clear liter containers.
PROCEDURES – DO NOT USE PERSONAL PRONOUNS IN THIS SECTION. Sentences should not start with First, Next, Then. Explain your procedures STEP BY STEP. Your instructions need to be detailed. The reader should be able to do your experiment the same way you did by following your procedure. If drawings, sketches, or pictures help make your methods clearer: include them. If you constructed any materials or equipment, explain that here. Check your procedure carefully for accuracy, completeness, and readability. Ask someone to proof-read your procedures and explain which areas need clarification.

RESULTS – Present your results neatly in tables or graphs. Tables and graphs need to be done on a computer. Allow time to get help if you don’t know how to do this. Try website: http://nces.ed.gov/NCESKiDS/createagraph/default.aspx

Each graph must have a title with the variables identified. Axes need to be identified with units and labels.

Include a detailed EXPLANATION of how you interpreted your data so that the reader will be able to follow how you reached your conclusions. If your data does not lend itself to graphing, this is where you can display your photographs. Each photograph needs to be identified with a caption or a short explanation. Pictures CANNOT include yourself (to remain anonymous) or minors without parental consent.

CONCLUSIONS – Write this section when you have finished preparing your results. Briefly summarize your results in the past tense. RESTATE your hypothesis in the present tense and tell how your data/results SUPPORTED or DID NOT SUPPORT your hypothesis. Give your interpretation of the results and discuss their significance. Don’t hesitate to mention difficulties you had or mistakes you made. Include other information that relates to your project that you obtained through your research. Include one or two suggestions for improvement or changes you would make if you repeated the project. Give one or two suggestions for what the next experiment might be based on your results.

ACKNOWLEDGEMENTS – Thank the people or businesses who helped you with your project, telling what they did for you. Do not name your parents or others – simply thank Mom and Dad or Grandma. Identify any financial support or donations you received.

BIBLIOGRAPHY – see attached
THE ABSTRACT

The abstract is a shortened version of your entire paper. Others can read your abstract if they do not have time to read your paper. Below this information write three short paragraphs:

- The Purpose
- The Procedure
- The Results (you may include conclusions in this section).

The entire abstract should be about 100 to 300 words and fit on one page. It is easier to write the abstract after you have written the entire research paper.

Sample Abstract

The purpose of this study was to prove that the mice would respond to conditioning through environmental manipulations in a maze. After an operant response is emitted followed by stimulus, the probability that the response will occur again is increased.

There are several examples of operant conditioning in humans as well as animals. Just as a human can find its way to the refrigerator in a house, a mouse can find its way to food in a maze. Just as a baby might find its way to a cabinet where treats are kept, a cat, such as my own, can try to open the door of the cabinet where its food is kept.

I built a large maze for two white laboratory mice. The first day that I brought them home from the pet store I just let the mice run around the maze to familiarize them with it. I decided that one mouse would be trained to enter the square room for food, and the other would be trained to enter the rectangular room for food. I also kept a daily log of the progress of each mouse. One mouse was quicker to respond than the other. However, both responded to the environmental conditioning as I had expected, and I feel that my experiment was successful.

This study of operant conditioning has been proven because the mice responded to a reinforcing stimulus by decreasing the time to arrive at the room in the maze as well as reoccurrence of the response. In order to survive, animals as well as humans must be able to learn. This learning enables them to make predictions about the future events and to use the environment to meet its needs.
<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Points Possible</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Display in on Time</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Question</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Hypothesis</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Completeness of Materials and Method</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Results (statement)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Conclusions (summary)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Pictures/Sketches</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Graphs</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Originality of Idea</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Eye appeal</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Measurements/Sturdiness</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Percent**

**Grade**
Hypothesis: If plant growth is related to the age of compost, then the older compost will have the most plant growth

<table>
<thead>
<tr>
<th>IV: Age of Compost</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3 month old compost</td>
<td>6 month old compost</td>
<td>No compost (control)</td>
<td></td>
</tr>
<tr>
<td>25 plants</td>
<td>25 plants</td>
<td>25 plants</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DV: Height of plants (cm.)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Constants:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of light</td>
<td>Amount of soil</td>
<td>Types of container</td>
<td></td>
</tr>
<tr>
<td>Amount of water</td>
<td>Type of plant</td>
<td>Type of soil</td>
<td></td>
</tr>
<tr>
<td>Amount of compost</td>
<td>Type of water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
pts. MATERIALS

4 pts. – All materials are identified in detail and listed neatly
3 pts. – Most of the materials are identified in some detail and listed
2 pts. – Some materials are missing and/or not identified in detail – difficult to read
1 pt. – No materials are listed

pts. METHOD/PROCEDURE

4 pts. – All steps followed are listed completely and with details. Easy to understand.
3 pts. – Most steps followed are listed somewhat completely and with most of the details. Some difficulty in understanding.
2 pts. – Steps are missing and/or details are missing. Difficult to understand
1 pt. – No Method/Procedure is listed.

pts. DATA PRESENTATION (Logs, graphs, tables, photos)

4 pts. - Data is complete, labeled, and easy to understand
3 pts. – Data is somewhat complete, mostly labeled, and somewhat easy to understand
2 pts. – Data is not complete and/or missing labels, difficult to understand
1 pt. – No data is presented

pts. RESULTS/DISCUSSION

4 pts. – Results are clearly written and discussed with details
3 pts. – Results are somewhat clear with some details
2 pts. – Results are unclear with many details missing
1 pt. – Results are not included

pts. CONCLUSION SUPPORTED BY DATA AND RELATED TO HYPOTHESIS

4 pts. - Conclusion answers the question and clearly explains with details from observations if the hypothesis was SUPPORTED or NOT SUPPORTED (rejected)
3 pts. – Conclusion somewhat answers the question and somewhat explains with some details from observations if the hypothesis was correct, incorrect, or partially correct
2 pts. – Conclusion does not answer the question and/or explain why the hypothesis was correct, incorrect, or partially incorrect
1 pt. – Conclusion is not present

pts. ORGANIZATION/FORMAT/NEATNESS

4 pts. – Display is well organized, neat and legible, correct spelling and grammar used, easy to read and understand
3 pts. – Somewhat organized, majority is neat and legible, some spelling and grammar mistakes, fairly easy to read and understand
2 pts. – Poorly organized, sloppy and illegible, many spelling and grammar mistakes, difficult to read and understand
1 pt. – Organization is lacking

TOTAL SCIENCE FAIR PROJECT POINTS (out of 40 points)