Okaloosa School District

Science Initiative

Science Fair 2011-2012

Contact Information

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Contact Information

- SRC Co-Chair: Sharon Richardson
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- Special Awards Chair: Victoria Blaylock
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- Judges Chair: Greer Harvell

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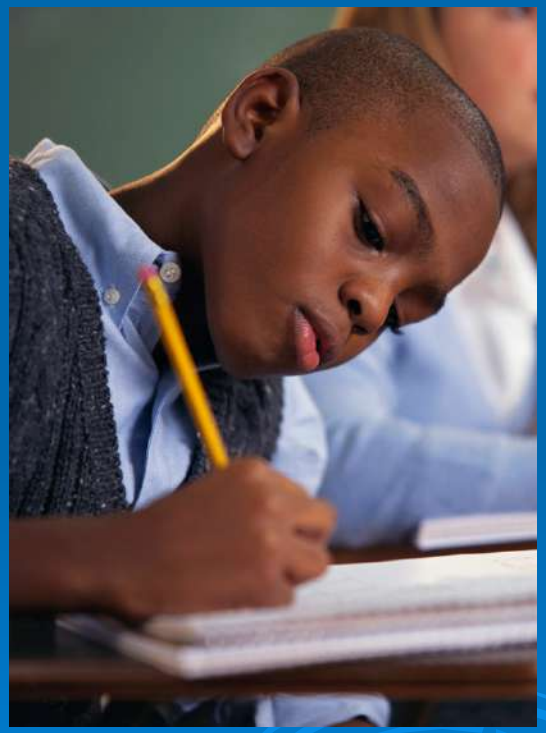
Start Your Log Book NOW

- Include
  - Ideas
  - Calls
  - Contacts
  - Background Research
  - Paperwork deadlines
  - Approvals
  - Data
  - EVERYTHING!



Pick a Topic

- Select something that interests you
- Try to find someone who shares your interest and who may be willing to act as your adult sponsor

Getting Started

- **How will my project be judged?**

http://www.societyforscience.org/page.aspx?pid=284

- **What are the possible topics/categories?**

http://www.societyforscience.org/page.aspx?pid=470

- **Where can I get an idea?**

http://www.societyforscience.org/sciencenewsforkids
http://www.societyforscience.org/sciencenews

- **What are the rules?**

http://apps.societyforscience.org/isef/students/wizard/index.asp
http://www.societyforscience.org/isef/rulesandguidelines

- **Where can I find the student handbook?**

http://www.societyforscience.org/document.doc?id=12

Problem/Goal

- The problem includes what you will be counting/measuring (C/M) and what factor (F) you are testing. For example:
  - What is the impact of light (F) on the growth rate (C/M) of a bean plant?
  - The engineering goal of this project is to design a runway surface (F) with decreased impact on tire wear (C/M) while maintaining braking integrity.

Identifying Variables

- Independent – What are you changing/testing? (intensity of light)
- Dependent – What are you counting or measuring? (growth of the plant)

- Controlled Variables – What factors will you **keep the same** in your control and experimental, so that you won't confound your variables? (temperature, water, soil)

HYPOTHESIS

Just follow this formula!

- Null Hypothesis: If (the independent variable) is NOT a factor in (the dependent variable); then, there will be NO significant difference between the control and the experimental.
  - Example: If light is not a factor in the growth of the plant; then, there will be no significant difference between the control group and the experimental group.

Hypothesis continued

- Alternate Hypothesis: If (the independent variable) is a factor in (the dependent variable); then, there will be a significant difference between the control and the experimental.
  - Example: If light is a factor in the growth of the plant; then, there will be a significant difference between the control group and the experimental group.

BIBLIOGRAPHY

- Check for the requirements in your specific category of study.

http://apps.societyforscience.org/isef/students/wizard/index.asp

- Format the bibliography in the prescribed style: for instance, human and animal research require APA format.
  - Tip: Use on-line resources to develop your bibliography. http://www.easybib.com/ or http://www.bibme.org/
- Sometimes specific site are required: for instance, microbiology requires a safety site, vertebrates require animal care and research ethics sites, etc.
- MSDS are required for ALL chemicals and are noted on both the Form 3 and the Bibliography.
- http://www.hazard.com/msds/ or http://www.msds.com/

Method/Procedures

- SAFETY: Assure that your research does not require prior approval. Define safety procedures and guidelines that you and your direct supervisor (if required) will use.
- Write a step by step procedure that includes a control group.
- Show that all variables are controlled except for the one you are testing.

Methods/Procedures

- Use a good sample size.
  - Use 100 plants for a good statistical sample
  - Or use less…but definitely more than one or two plants. Select plants that are inexpensive or that can be grown from seed.
  - Multiple trials may be necessary. If cost is prohibitive, record a baseline rate of growth and then change the variable and record the rate again. Repeat as necessary to acquire sufficient data.

Methods/Procedures continued

- Collect NUMERICAL data.

  If the growth of the plant is being study then you may notice that your experimental group "looks bigger." Unfortunately that is subjective and can not be analyzed. Instead:

  - count the number of new leaves;
  - measure the height;
  - Determine the change in biomass.

  Use the correct Metric units.

Paperwork –BLUE signatures

- Required Forms for ALL projects
  - 1 - Checklist for Adult Sponsor (prior to experimentation)
  - 1A - Student Checklist and ***Research Plan***
  - 1B - Approval Form (one/participant)

  http://www.societyforscience.org/page.aspx?pid=282

  State Entry Form (individual or team) *

  http://www.floridassef.net/wp-content/uploads/2011/10/SSEF-Entry-Form-2012.pdf

  http://www.floridassef.net/student/student-forms/
  - ISEF Abstract Instructions and Form

  http://www.societyforscience.org/document.doc?id=24
  - 2011-2012 Changes: http://www.floridassef.net/wp-content/uploads/2011/10/2012-SSEF-Rules-Supplement.pdf

Paperwork HELP!

- Rules

http://www.societyforscience.org/page.aspx?pid=282

Risk Assessment Guide

http://www.societyforscience.org/document.doc?id=40

Guidelines for Biosafety Level 2 Laboratory Facilities & Operations

http://www.societyforscience.org/document.doc?id=25

Tips and Advice

http://www.societyforscience.org/page.aspx?pid=355

You may have to download a program.

Results/DATA Collection

- Table your data:
  - Title
  - Label columns
  - Units

The growth of Phaseolus vulgaris (kidney beans) as affected by light intensity			
Day (beginning 09/01/2007)		100 watt plant light with filter	100watt plant light
		Growth in height (cm)	
1			
2…etc.			

Results/DATA Analysis

- Table of the averages
- Statistical tests

http://www.physics.csbsju.edu/stats/t-test.html

- Graphs
  - Line- change over time
  - Bar- comparing variable to control
  - Label the axis' (remember units)
  - Title the graph

Write It Up
Discussion/Evaluation

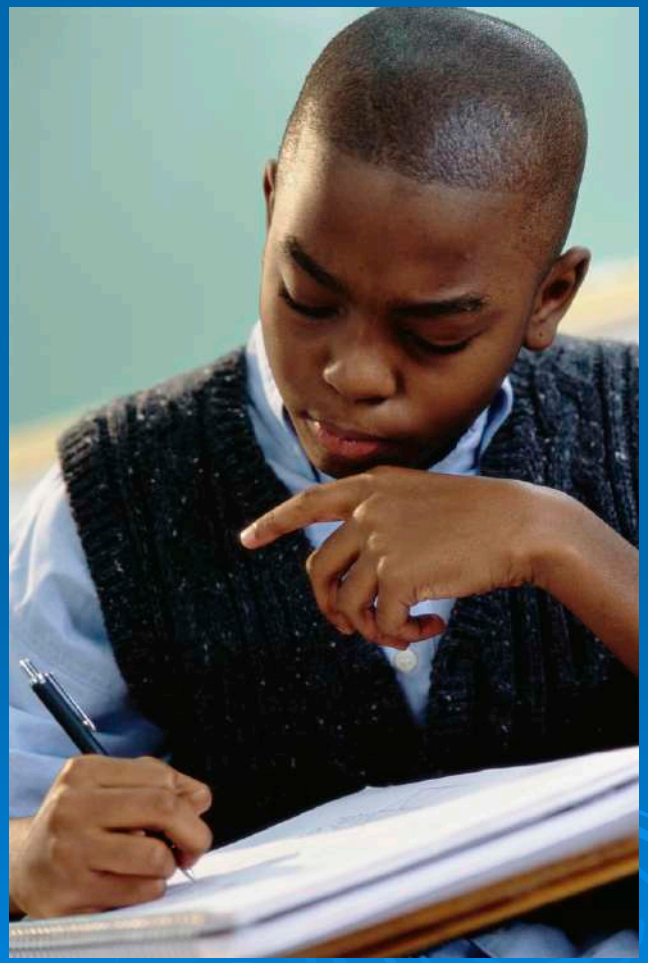
- What problems did you have?
- What would you do differently?
- How could you make your procedures better?
- How do your results compare to what other research shows?

Write It Up
Conclusion

- Summarize your results using the wording in either your null or alternate hypothesis.
- Give data, student t-test and averages, to back-up your claim.
- Tell how your findings are important.

Write It Up
Introduction

- Restate problem, hypothesis, variables, in a paragraph format.
- What prompted your research?
- What do you hope to find?



Write It Up
Abstract

- How do I write an abstract?

http://www.societyforscience.org/ISEF/students/abstract.asp

Display

- Display and Safety Regulations
- http://www.floridassef.net/wp-content/uploads/2011/10/display-and-safety-certification-2012.pdf
- Read these carefully!
  - Size guidelines
  - What is not allowed to be displayed
  - Location of required elements

Other Opportunities of Scientific Advancement

- SSP Middle School Program
- http://www.societyforscience.org/msp
- Intel Science Talent Search
- http://www.societyforscience.org/sts

See you at the FAIR!

East Panhandle (Robert Sheffield) Regional Fair 2011

- Set-up* February 7
- Judging February 8
- Open Public Feb. 9
- Take-down Feb. 10
- Awards** Feb. 15

State Fair

- April 3 - 6
- Lakeland, FL

International Fair

- May 12-19
- Pittsburgh, PA

- * Northwest Florida Fairgrounds
- **TBD