SCIENCE FAIR PACKET
2008-2009

(Compiled and written by Lynn Vogel, St. Agnes School, Springfield, MO)

ST. AGNES SCIENCE FAIR
Wednesday, November 12, 2008

OZARKS SCIENCE AND ENGINEERING FAIR (Regional)
April 2009

SCIENCE OLYMPIAD
(Regional Competition)
Saturday, March 2009

SCIENCE OLYMPIAD
(State Competition in Columbia)
TBA

Name_____

Science Fair 2008-2009

(Before you begin, please note that *research* refers to library research and information gathering. *Experimentation* refers to work done in the field or laboratory after forming a hypothesis.)

VERY IMPORTANT: Throughout this entire Science Fair process, be sure to save all of your work to your computers hard drive, flash drive and disk.

GETTING STARTED: Fall, 2008

CHOOSE YOUR TOPIC

Ideas may come from your hobbies or interests.
Your ideas may be from problems that you think need solutions.
Ideas may come from something you have studied in Science or Math.
Ideas may come from your new Science book.
Ideas may come from library research.
Ideas may come from the Internet.
Ideas may come from your own curiosity.

Each time you think of an idea write it down.
List your ideas on page 3 of the science Fair Packet.

VERY IMPORTANT: The topic you pick must result in data that can be measured and expressed in numbers.

Try to pick a topic that is unique and has not been "over-tested" in the past unless you can design an experiment that is different.

Some topics to avoid are "which battery will last the longest," "watering plants with different liquids," "music's effect on blood pressure."

List your topics, questions, or ideas below:
(Bring this list with you when we conference.)

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

SCIENCE FAIR 2008-2009

Please sign up for your Science Fair conference as soon as possible. Available times and dates will be posted on the St. Agnes website after school starts. Go to the St. Agnes home page, click on 8th Grade, and go to the link under Science Fair conferences.

When we conference, be sure to bring your list of ten ideas so you can determine a final selection and approval of your project. Also, bring one or both of your parents because they are a big part of Science Fair.

If anyone would want to conference this summer or before August 1st, give me a call (882-4987) and we will set a time.

Ms Vogel and Mrs. Payton will conference from 7:30 to 8:00 a.m. and from 3:35 to 3:55 p.m. from August 25th to September 25th.

Each conference should last about 10 minutes.

Science Fair 2008 Conference

<u>After</u> final topic has been selected, complete this paper.
Turn the completed paper in the day after your Science Fair conference.

FINAL TOPIC: _____

QUESTION OR PROBLEM:

MATERIALS YOU WILL USE:

INDEPENDENT VARIABLE: What is the one thing you will CHANGE when you do your experiment?

CONSTANT: What are the things that will be the SAME throughout your experiment?

DEPENDENT VARIABLE: What happens because of what you did? (You can't answer this until your experiment is finished.)

SUBJECTS: If your experiment involves PEOPLE:

- **WHO will you test?**
- **WHEN?**
- **WHERE?**
- **HOW MANY will you test?**

RESEARCH
September 25th - October 2, 2008

Because Science is an always-changing, always-improving field, use research that is current and contains the latest information on your topic.

Research at least 5 articles or books about your topic. You may use the library or the Internet for your research. Don't forget about government agencies, companies, and/or university professors as sources for your research.

If you are doing an experiment that involves animals (vertebrates), a 6th reference on animal care is required.

Five (or six) sources are required for your science project. However, you will be more knowledgeable and confident about your project the more resources that you read and study. Copy these articles and read them. (But only copy the information that is relevant to your experiment.)

Write a summary of each article in your own words.
Use a separate sheet of paper for each article.

Be sure to correctly cite the sources of your research.

(See page 7 for help on this.)

NECESSARY INFORMATION FOR CITING ACCORDING TO MLA:

BOOKS
Title
Author
Publisher
Place of publication
Year of Publication

MAGAZINES
Title of article
Author of article
Name of magazine
Day, month, year
Page(s) used

INTERNET
Website title
Web address
Author of article
Date of publication or update
Date accessed
Publisher (if available)

ENCYCLOPEDIA
Name of encyclopedia
Search word
Volume
Position
Pages used

COMPANY
Name of company
Address
Person contacted
Position
Day, month, year of contact

EXPERT
Name of expert
Address of expert
Day, month, year of contact

FINAL COPY of your research is due Friday, October 2, 2008
(However, if you complete your research before this date, please give it to Ms Vogel.)

***See next page for correct way to put this information in your bibliography according to MLA documentation.**

WORKS CITED PAGE
(according to MLA documentation)

Following are examples of more common MLA documentations.

BOOK:
Author. Title. City of Publication: Publishing Company, Year of Publication.

MAGAZINE ARTICLE:
Author. "Title of Essay." Magazine Day Month Year: page/s.

NEWPAPER ARTICLE:
Author. "Title of Essay." Newspaper Day Month Year: page/s.

INTERVIEW:
Name. Personal Interview. Day Month Year.

MUSIC RECORDING:
Artist. "Song" Album or CD. Recording Co., Year.

INTERNET SOURCE:
Author (if available). Web Site Title. Publisher (if available). Date of publication or latest update (if available). Date accessed <address>. Date always appears as Day Month Year.

Be sure that all of your entries are alphabetized.

If your source has no author, then begin your citation with the title (the, an , a do not count s first words in a title).

The first line of your citation is left margin justified and second line is tabbed in 5 spaces.

Double space between each line of your citation.

CITES AND SUMMARIES OF RESEARCH ARTICLES
Due Date: Friday, October 2, 2008

You will need at least 5 copies of this page, or you can do the cites and summaries of your remaining research articles on your own paper, following this format.

Name _____

Your Science Fair Question (that your are trying to answer)
_____

Title of Research Book or Article:
_____

Author:_____

Main ideas of the book or article. Be sure to include the scientific information that relates to your science project. (Attach a separate sheet if necessary.)

How does this book or article relate to YOUR Science project?

Correctly cite this book or article for your bibliography. (See page 7 of your Science Fair Packet to know how to cite your book or article.)

From what you have learned from your Science Fair topic from your research, write you hypothesis. (You only need to write your hypothesis one time.)

Name_____

Restate your hypothesis:

_____

_____

WRITE YOUR PROCEDURE
(October 3-7)

Your procedure is due October 7, 2008.

Write a detailed description of HOW you are going to DO your experiment in the space below. Use an additional sheet(s) of paper if necessary. Number each part of the procedure. Be very specific and detailed.

(Heads-Up: Your procedure is due October 7, 2008)

SCIENCE FAIR FORMS

Forms 1, 1A, and 1B
must be completed before experimentation can begin.
Ms Vogel will help you with these.

If you are testing people or vertebrate animals, you will need to complete these additional forms before you begin experimentation:

PEOPLE	VERTEBRATE ANIMALS
Form 4	Form 2
	Form 3
	Form 5A

If you are growing MOLD or BACTERIA, you will need to complete Form 6A and 6B before you begin experimentation.

See Ms Vogel for these forms before you begin your actual experimentation. She will help you complete these forms if you need help.

After the St. Agnes Science Fair, those people going to the Regional Science Fair will complete the necessary paperwork to advance to the Regional Fair.

Ms Vogel will also help you with that paperwork.

Your most important and most valued possession as you do your experiment is your…..

PROJECT DATA BOOK

Record everything you do in your Project Data Book (your "Cow Book").

1. **Use Ink**
2. **Do not tear any pages out of your Project Data Book.**
3. **Use correct grammar and spelling**
4. **If you make a mistake, cross out the mistake with one line and rewrite.**

Begin your Project Data Book with a Title Page which has:

Name of your project
Your name
St. Agnes School
Your grade

2nd Page should have:

Your question
Hypothesis
Materials used

3rd Page will have:

Procedure

(So far, you have basically copied Form 1A.)

Then you will record your <u>experimentation:</u>

Record your data as you collect it. Take good notes.
Write everything down. Don't rely on your memory.
Be very detailed and accurate in the recording of your data.
You can include photographs, drawings, charts, graphs, etc. in your Project Data Book.

(Your PROCEDURE was due Friday, October 7, 2008)

NOW YOU ARE READY TO DO YOUR EXPERIMENT…

GATHER YOUR DATA

(In other words, DO your experiment.)

RECORD YOUR DATA

(Use graphs, charts, tables, etc. to show what you found out by doing your experiment. Don't forget to record ALL of your data in your Project Data Book.)

ANALYZE YOUR DATA

(In other words, what did your data tell?)

DRAW A CONCLUSION:

Does what you found out, agree with what you thought would happen? In other words, does your collected data SUPPORT your hypothesis? How? Why?

COMPLETE THE FOLLOWING:

After completing your experiment, did you find that your collected data supports your hypothesis? (Yes/no) _____ (Was your hypothesis "right"?) Why? Why not? (Be very specific. Use another piece of paper if needed.)

RESEARCH PAPER

Don't Panic!

A research paper must be displayed along with the Project Data Book. But don't panic-you basically have the research paper written. All you have to do is organize it into the form listed below:

a) **Title Page. Center the project title and put your name, address, school, and grade at the bottom right.**

b) **Table of Contents. Include a page number for the beginning of each section. (It is better to do your Table of Contents <u>after</u> you have completed your Research Paper.)**

c) **Introduction. The introduction sets the scene for your report. The introduction includes your hypothesis, an explanation of what prompted your research, and what you hoped to achieve.**

d) **Experiment. Describe in detail the methodology used to collect your data or make your observations. Your report should be detailed enough so that someone would be able to repeat the experiment from the information in your paper. Include detailed photographs or drawings of self-designed equipment. Only include this year's work if this is a continuation of last year's.**

e) **Discussion. The discussion is the essence of your paper. The results and conclusions should flow smoothly and logically from your data. Be thorough. Allow your readers to see your train of thought, letting them know exactly what you did. Compare your results with theoretical values, published data, commonly held beliefs, and/or expected results. Include a discussion of possible errors. How did the data vary between repeated observations of similar events? How were your results affected by uncontrolled events? What would you do differently if you repeated this project? What other experiments should be conducted?**

f) **Conclusion. Briefly summarize your results. Be specific, do not generalize. Never introduce anything in the conclusion that has not already been discussed.**

g) Acknowledgements. You should always credit those who assisted you, including individuals businesses, and educational or research institutions. Identify any financial support or material donations received.

h) References. Your reference list should include any documentation that is not your own (i.e., books, journal articles, interviews, internet articles, etc.). See page 7 of the Science Fair Packet for the correct way to cite your references.)

(This is your "Bibliography" from your research. Just recopy it and put it here.)

VISUAL DISPLAY
(YOUR SCIENCE FAIR "BOARD")

Now you're ready to show off what you learned from your research and experimentation!

HELPFUL HINTS FOR YOUR SCIENCE FAIR BOARD:

1. **A GOOD TITLE: Your title is an extremely important attention-grabber.**

2. **EYE CATCHING: Make people want to read about what you did. Make your displays stand out. Anyone should be able to understand your experiment from your visual display without further explanation.**

3. **BE ORGANIZED: Make sure your display is logically presented and easy to read. A glance should permit anyone (particularly the judges) to locate quickly the title, experiments, results, and conclusion. When you arrange you display, imagine that you are seeing it for the first time.**

4. **PHOTOGRAPHS and/or GRAPHS: Many projects involve elements that may not be exhibited at the actual Science Fair, but are an important part of your project. You may want to use photographs and/or graphs on your board show these aspects of your projects.**

   V.I.P. Each photograph in/on your display must show the name of the person who took the picture. (Photo taken by_____)

   V.I.P. Every person in your photo(s), other that you, must give written consent for you to use their picture in your Science Fair project. These written consent forms must be displayed with your project.

VISUAL DISPLAY (CONT'D)

5. **CORRECTLY PRESENTED: Your "board" must be freestanding. Be sure your "board" complies to the size requirements and limitations listed below:**

76 cm (30in.) deep, from to back

122 cm (48 in.) wide, side to side

274 cm (108 in) high, floor to top

Tables are 76 cm (30 in.) high

Science Fair Boards can purchased at various places in Springfield: I.P.A., Staples, Office Depot and Hobby Lobby are just a few.

ABSTRACT

After finishing your research and experimentation, you are required to write a (maximum) 250-word, one-page abstract. (Remember: You can't do your Abstract until your experiment is FINISHED.)

An abstract should include the following:

1. **Purpose of the experiment**
2. **procedure used**
3. **data**
4. **conclusion**

It may also include any possible research applications or future research.

See below for an example of an abstract. Your abstract must be in this exact form.

Sample Abstract

Effects of Marine Engine Exhaust. Water on Algae
Jones, Mary E.
123 Main Street, Hometown, PA 20920
Hometown High School, Hometown, PA

The project in its present form is the result of bioassay experimentation on the effects of two-cycle marine engine exhaust water on certain green algae. The initial idea was to determine the toxicity of outboard engine lubricant. Some success with lubricants eventually led to the formation of "synthetic" exhaust water which in turn, led to the use of actual two-cycle engine exhaust water as the test substance.

Toxicity was determined by means of the standard bottle or "batch" bioassay technique. Scenedesmus quadricauda and Ankistrodesmus sp. were used as the test organisms. Toxicity was measured in terms of a decrease in the maximum standing crop. The effective concentration-50% (EC50) for Scenedesmus quadricauda was found to be 3.75% exhaust water; for Ankistrodesmus sp. 3.1% exhaust water using the bottle technique.

Anomalies in growth curves raised the suspicion that evaporation was affecting the results; therefore, a flow-through system was improvised utilizing the characteristics of a device called a Biomonitor. Use of a Biomonitor lessened the influence of evaporation, and the EC 50 was found to be 1.4% exhaust water using Ankistrodesmus sp. As the test organism. Mixed populations of various algae gave an EC 50 of 1.28% exhaust water.

The contributions of this project are twofold. First, the toxicity of two-cycle marine engine exhaust was found to be considerably greater than reported in the literature (1.4% vs 4.2%). Secondly, the benefits of a flow-through bioassay technique utilizing the Biomonitor was demonstrated.

JUDGING AND GRADING

The Ozark Science and Engineering Fair uses International Science Fair Rules as its criteria for judging. This criterion is shown below:

Judging Criteria (points)

Individual & Creative Ability	**30**
Scientific Thought & Engineering Goals	**30**
Thoroughness	**15**
Skill	**15**
Clarity	**10**

The same standard for judging is used for grading the Science Fair projects when oral presentations are given during Science classes.

The schedule for oral presentations is:

November 3-4, 8th grade;

November 4-6, 7th grade;

November 6-7, 6th grade.

I encourage parents, to come to these presentations, as they are quite impressive.

The same standard is also applied at the St. Agnes Science Fair on November 12th with one additional criterion: The last question on the judging form for the St. Agnes Science Fair for 7th and 8th Graders is, "Should this project advance to the Regional Science Fair?"

GREATER OZARKS SCIENCE AND ENGINEERING FAIR
APRIL 2008

The Greater Ozarks Regional Science Fair encompasses the entire Springfield area and the bottom fourth of the state of Missouri. To be selected to advance to the Regional Science Fair is, in itself, and honor. We strongly urge any student selected for the Regional Science Fair to participate in it. However, this in not required. Students participating in the Regional Science Fair will have 10 additional points added to their Science Fair grade.

Students not selected to attend the Regional Science Fair can earn the additional 10 points by writing and typing a one-page paper explaining why they think their project was not selected to go to the Regional Fair and what they could have done to improve their project.

If you have any questions about Science Fair, at any time during this whole Science Fair process, please give me a call. Thank you.

Lynn Vogel
882-4987

My child and I have studied and reviewed the Science Fair Packet. These are our questions:

_____ _____

Parent Signature **Date**