**September 5, 2014**

Dear 5th & 6th grade families,

The first week in science class has been a success! Over the next two months, we will be working hard on Science Fair projects. These projects have many components and are graded heavily.

As your child begins to look for topics, please keep in mind the following guidelines:

- No animal, human or bacteria projects. These need special endorsements, which must be approved before the student begins experimenting (this includes body tissue such as teeth). Also, any projects involving tobacco, alcohol or explosive materials will NOT be approved.
- Make sure it is a "TRUE" experiment. The experiment should have a variable with controls and not merely be a demonstration.
- **5th graders** will NOT be responsible for the **RESEARCH/REVIEW of LITERATURE** portion this year.
- Please check out the CPS science fair website for all the requirements and handbook. http://cpsscifair.org/

In this packet, you will find the guidelines, schedule and other important information. All guidelines will also be posted on the Waters School website. Please pay close attention to the "**SCIENCE PROJECT TIME MANAGEMENT FORM."** Students must turn this form in with the required work on all check in dates. This form is a valuable piece of communication between home and school throughout the project. If a student is not prepared for the check-in, a letter will be sent home for the parent to sign. **Please check in with your child on a regular basis to track their progress and encourage them in their efforts.**

Sincerely,

Mrs. Del Campo

5th & 6th grade Science Teacher

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Please sign below and return by FRIDAY, SEPTEMBER 12TH.

## WE have received the Science Fair Project Packet and have reviewed it.

Parent/Guardian NAME: _____

Student NAME: _____

Parent/Guardian SIGNATURE: _____

Student SIGNATURE: _____
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Science Project Time Management Form

Name: _____ Room: _____

| Component | Date Due | Date Completed | Teacher Initials | Parent Initials |
|---|---|---|---|---|
| Approval of Topic / Begin Research | September 10th | | | |
| Problem / Purpose and Hypothesis Due (Written in paragraph form). | September 17th | | | |
| Experiment Plan (materials, procedural steps, with all controls & variables identified) | | | | |
| Safety Sheet Due | | | | |
| Evidence of Experimentation Due (photos, charts, notes, etc.) | October 8th | | | |
| Rough draft of research due | October 27th | | | |
| Abstract Due (3 paragraph summary of project) | October 30th | | | |
| Experimental Observations & Results due | | | | |
| Final Completed Project Due | November 14th | | | |

## 1. Choosing a Science Fair Project

a. How to choose a good project

- **MUST BE INVESTIGATIVE**: testing, measure something, compare 2 or more things, collecting data…..
- Look for words like: "**to find out," "to figure out," "to compare**"
- Words to avoid: **"to demonstrate," "to show" NO DEMONSTRATIONS**
- Look at materials: **Are they easy do get/expensive? Do you know what they are?**
- Look at procedure: **Do you understand it? Can you do it in a couple weeks?**
- Will this be something **easy to research?**
- Finally, ask yourself, "**Why would someone want to know the answer to my question I want to test?"**

If you don't know, it's probably not a good project.

**Finding a Project:** ** Visit your local library

http://www.sciencebuddies.org/mentoring/science-projects.shtml: You can click on "topic selection wizard" to help you figure out what area of science you want to concentrate on.

http://school.discoveryeducation.com/sciencefaircentral/?pID=fair http://www.education.com/science-fair/

2**. Think of a Question**- Your question will drive your entire project. Make sure that your question is something that can be measure and answered by following the scientific process. Your question will also be the title of your project.

**Project Question:**

_____

3. **Research Topic for hypothesis**- Spend some time learning more about your topic. Use reliable Internet sources, books, or other resources.

**a.** ***Key Words*** – locate at least 3 key science words related to your topic. Make sure that the words your choose are directly related to your topic. Provide definitions of each key work IN YOUR OWN WORDS.

| Key Word | Definition |
|---|---|
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4. **Formulate and state your hypothesis** – Decide what you think the outcome of your project will be based on your research and make a good guess as to what you think the answer to your question will be. ALSO EXPLAIN WHY YOU THINK THAT WILL BE THE OUTCOME. Remember, it is ok if you don't have the right answer; that is how scientists make discoveries. Make sure that you hypothesis is written in an **"If/then/because" statement.**

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5. **Design Your Experiment** – Clearly write out the procedure you are going to follow. Remember that your experiment needs to follow the scientific process and that you need to have one variable that you are going to change.

**a. Variables** – List the variables that you are going to keep the same and the one variable that you are going to change. You need to have at least one control (normal) variable and at least two to three other variables.

Identify your variables. Use **I.V.** for independent, **D.V.** for dependent & **C.V.** for control

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

**b. List the all materials/equipment required**

_____ _____ _____

_____ _____ _____

_____ _____ _____

**c. Write your procedure** – Think through each step very carefully and write your steps in paragraph form using transition words to move from one step to the next

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6. **Conduct Experiment** – When you do your experiment, you need to collect data and make observations. You will complete these in your Experiment Log. After you have complete the experiment use you log to write down that data and observations below. In your log you need to:

**a. Collect Data** – You will need to collect numerical data; that means you need to take measurement during the experiment. It can be temperature, distance, height, etc. You will analyze that data later to determine the results of your experiments. **ON THE BACK ON THIS SHEET, CREATE A DATA TABLE TO KEEP TRACK OF YOUR RESULTS**.

**b. Make Observations** – As you conduct your experiment, you will use your senses (sight, smell, touch, etc.) and write down any observations you make during the process. _____

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7. **Determine the Results** – Now it is time to review your data and observations to find out what happened. Think about the best way to show your data: bar graph, line graph, chart, etc. and then create a table or a graph using your data. Write out the results of each test in the experiment in paragraph form using complete sentences. Make sure that you include numerical data (measurements) as well as any other important observations that you made.

a. **Results (graph or chart):** On a **separate sheet**, draw or use a computer to generate formal graphs to analyze your data.

b. **Results (paragraph form):**

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8. **Draw Conclusions** – After you have determined the result, it is time to decide the answer to your original question. Write your answer in a complete sentence using the question to begin your answer. You also need to tell whether your hypothesis was correct or incorrect. If it was incorrect, explain why you think so. End this paragraphs by saying how you could change or improve your experiment in the future.

Answer your original question: _____

_____

_____

Is your hypothesis correct or incorrect? If incorrect, why? _____

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If you were to complete this experiment again, what changes would you make? How would you improve this experiment?

_____

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9. **Abstract** – This is a THREE paragraph summary of your project. The first paragraph introduces your project by explaining the purpose; what you set out to investigate. The second paragraph explains your procedure; what you did and how you did it. And the third paragraph presents your results and conclusion. It needs to be no more then **200 words** long, **single-spaced** when typed.

P:1- _____

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P:2- _____

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P:3- _____

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10. **Safety Sheet** – This is a list of possible hazards and precautions described.

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11. **Creating Source Cards** – To keep track of your sources, you will fill out a source cards for each resource you use. Must have a variety of at least 12 sources & are current (within the last 7 years).
12. **Scan/Evaluate the Source**- Read through sources to see if it relates to your topic.

13. **Creating Notecards-** Begin reading and note-taking

14. **Literature Review** – Use the resources you found for you topic and list the relevant facts from each one.

**a. According to the** (author/source) _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

(You can add more facts as you find them)

In conclusion _____ says _____

_____

_____ about the topic.

**b. Another idea by** (author/source) _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

In conclusion _____ says _____

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_____ about the topic.

**c. A third writer,** (author)_____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

The third writer concludes that _____ says _____

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_____ about the topic.

**d. A fourth source,** _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

This writer concludes _____ says _____

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_____ about the topic.

**e. Yet another idea from** _____(date_____) the main idea

about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

This author concludes _____ says _____

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_____ about the topic.

**f. According to this** (author/source) _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

In conclusion _____ says _____

_____

_____ about the topic.

**g. According to the** (author/source) _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

In conclusion _____ says _____

_____

_____ about the topic.

**h. Another idea by** (author/source) _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

In conclusion _____ says _____

_____

_____ about the topic.

**i. A third writer,** (author)_____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

The third writer concludes that _____ says _____

_____

_____ about the topic.

**j. A fourth source,** _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

This writer concludes _____ says _____

_____

_____ about the topic.

**k. Yet another idea from** _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

This author concludes _____ says _____

_____

_____ about the topic.

**I. According to this** (author/source) _____(date_____) the main idea about this subject is_____

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List facts from the source that support this idea

- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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- fact: _____

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(You can add more facts as you find them)

In conclusion _____ says _____

_____

_____ about the topic.

**15.** ***A written piece (Review of Literature) describing the Science behind your project is now in order*** – Not only do you want to be an expert on your topic, but you want to teach others about your topic. After you have completed your research, give us (your audience) some background information on your topic. Give specific, rather than general information. Use of 3rd person is evident. Provide information that supports the hypothesis as well.

## A Guide to Help You Write Your Science Fair Review of Literature

**INTRODUCTION GUIDELINES** -Your introduction is one paragraph and begins your Review of Literature. Follow the guidelines below to help you write your introduction. Your introduction tells what the paper is about and how it has been organized. DO NOT USE PRONOUNS (I, YOU, WE, MY…).

**First sentence: Developing a HOOK-** Gets the audience's attention with a question indicating the purpose. What is interesting about your research question? Hook your readers with an interesting fact that might make them curious about this topic.

For example: What is the best outdoor structure material to resist the effects of acid rain?

**Second sentence:** Retells the title of the project -- usually best if in question form.

For example: Which material should the world use to defend itself from acid rain?

**Remaining sentences:** (You might have anywhere from 2-6 sentences) Gives a list of the questions or topics researched. The order you put the questions researched in this paragraph should be the order your umbrellas come in the body paragraphs.

For example: In order to find out the answers to these questions, one must explore how acid rain forms and the effect of acid rain. Also, the physical properties of the five structural materials must be researched. These materials include glass, steel, granite, wood, and brick.

**CONCLUSION GUIDELINES** - Your conclusion is one paragraph and is the LAST paragraph of your Review of Literature. It may sound similar to your introduction but effort must be made to word them differently. Again, DO NOT USE PRONOUNS (I, YOU, WE, MY…).

**First sentence:** Repeats the question that the paper started with to regain the audience's attention (but worded differently).

For example: Does wood, steel, granite, brick or glass hold up best in acid rain?

**Next several sentences:** Summarize the main points of the paper that help answer this question. This should be info you have learned from your research.

For example: Acid rain takes out nutrients from leaves when it touches them, therefore weakening the tree where wood for buildings comes from. Acid rain can also damage steel and deteriorate the surface of granite and brick. No damage has been reported on glass.

**Next sentence:** Cites applications where this information could be used. Why it's important.

For example: These findings could help architects and builders choose quality materials that will withstand the pressures of acid rain in the future.

**Last sentence:** Give one or two places the reader could find more information on the topic. This could come from your reference list. You should list the title and author or website. Titles of books need to be underlined.

For example: For more information on acid rain and its effect read this web page by John Gordon,

Mark Nilles and LeRoy Schroder http://bqs.usgs.gov/precip/reports/arfs.htm .

**** Plagiarism:** Plagiarism is when you copy someone else's words and use them as your own. This is illegal! When you are doing your research, be sure to put the information you find into your own words. If you really like the way an author wrote something and you don't want to change it, put it in "quotes." Quotes tell the reader that you copied a sentence word for word and that it's ok, as long as it is in quotes. However, don't do this too often.

## 16. Putting your paper together

** Follow this order when complying your final paper.
** Begin numbering pages starting with the title page
** (Project title & last name typed at the top left of all pages)

Abstract
Safety Sheet
Endorsements (if needed)
**Then:**
*Page 1* - Title Page
*Page 2* - Table of Contents (Project title & last name typed at the top left of all pages)
*Page 3* - Acknowledgements
*Page 4* - Purpose & Hypothesis
*Starting on Page 5* – Research (review of literature, 3-5 pages)
*Next Page*- List Materials, Steps, Controls & Variables
*Next Page*- Results, picture, charts, graphs, etc.
*Next Page* - Conclusion
*Final Page* – Reference List
(List of all books, articles & websites you used in your research in alphabetical order. Must be in APA format).

*** **Typing Your Project** – The final project should be doubled spaced typed with a font size no larger than 12.