DOUGLAS COUNTY SCHOOL SYSTEM

STEM
SCIENCE | TECHNOLOGY | ENGINEERING | MATH

MASON CREEK ELEMENTARY SCHOOL

3400 Johnston Road
Winston, GA 30187
Phone: (770) 651-4900 Fax: (770) 920 - 4282

Kristin Martin	**April Gaines**	**Andral Hills**
Principal	Assistant Principal	Assistant Principal

Dear Parent(s) or Guardian:
The science fair project is an activity that draws upon basic and advanced skills that have been taught and emphasized in your child's science program. Students generate a problem or question and apply the scientific method to solve the problem or answer the question. Your help may be needed throughout your student's project. For example, your child may ask for your assistance in the following ways:

- Conducting research via libraries or Internet.
- Typing presentation materials for display.
- Retrieving necessary materials needed for their experiment.

One good site to visit with your child is www.sciencebuddies.com . This website will help guide you and your child through all components of a science fair project.
Please go over the information presented in this student science fair handbook and discuss it with your child. Some of the details not in the handbook have been or will be discussed in class. (This information is available on the Mason Creek Elementary Webpage under the Parent Tab.)
All Program Challenged students in third – fifth grade, will be required to participate in the Science/Engineering Fair.
Students are also able to work with one other student for the science fair.
Contact me or your child's teacher at school with any concerns or questions.
Sincerely,
Cody Smith
Science Fair Coordinator
cody.smith@dcssga.org

Please Return the Below Portion by Friday, September 20th.

My student, _____, will be participating in the 2019 – 2020 Science and Engineering Fair.

Parent Signature: _____
Homeroom Teacher: _____

Question/Problem Student will be addressing in project:

_____

_____

STUDENT SCIENCE FAIR PROJECT TIMELINE outline

You may choose a project which focuses on current class content, or even previews next year's content. In designing your project, you will answer an original question using in-depth research and a well-planned experiment.

Task	Due Date	Teacher Initials	Parent Initials
1. Choose and submit a problem/question to investigate for teacher approval.	9/20/19		
2. Start your log book (Include thinking about a problem/question as your first entry)	9/25/19		
3. Conduct preliminary research. (Search for related facts and information)	10/2/19		
4. Develop a hypothesis based on your preliminary research.	10/9/19		
5. Decide on the procedure that you will use to test your hypothesis.	10/16/19		
6. Make a list of your materials. Gather your materials.	10/16/19		
7. Conduct your experiment. Collect and record data.	11/15/19		
8. Organize your data and results.	11/22/19		
9. Write your conclusion based on the results of your experiment.	12/6/19		
10. Write a draft of your science fair report (if your teacher requires it).	12/18/19		
11. Proofread your draft. Type or write a final copy of your report (if teacher requires)	1/10/20		
12. Complete your science fair display.	1/20/20		
13. Turn in your science fair project (report optional, log, and display).	1/24/19		

The Science and Engineering Fair will be held on January 28th, 2020.

STEPS

PROBLEM/QUESTION
State the problem in the form of a question.

RESEARCH
Do background research to find out what other scientists have discovered about your topic. Your research is a gathering of everything that you did to investigate your selected topic. It contains all the information you collected or learned during the weeks leading up to the actual experiment and science fair. The information you collect can be from and from sources from the library and electronic media. Write this in your own words; cutting and pasting is not an option.

HYPOTHESIS
State your best guess for answering the question before you perform the experiment. The hypothesis is a logical and testable prediction about how things work. It should be written like this:

"If _____ (I do this), then _____ (this) will happen." The blanks are filled in with appropriate information related to the specific experiment. It should be something that you will **both** test and measure during your project work.

Example:

If I heat a magnet, then it will be able to pick up more paper clips than the same magnet at room temperature or when kept in the refrigerator.

You will measure both the temperature of the magnet and the number of paper clips it picks up.

LOGBOOK
Logbooks are used in every aspect of real research as a means of keeping an honest, chronological account of an investigation. Everything you do should be logged. You should begin your brainstorming about topics and problems/questions in your logbook. It should also include the notes you take when you do your research, as well as, all you do as you prepare and carry out your experiment. A logbook is like a journal. You should write the date at the top of

each page. You should make an entry every time you work on your project. Keep up with it. You should not go back and write all the entries after you have finished your project.

Your logbook should include:

- Paragraph summary of what you did on each day (from thinking about the topic to completing the display)
- Notes that you took when you did research and the bibliographical information of every source you used (include the name of the author, year of publication, title, name and location of publisher, page numbers, website address and the date you retrieved it off the Internet, etc.)
- Labeled drawings or diagrams that help show the reader what you did or what happened on that day
- Any data you collected when you did the experiment
- Any conditions that might have caused unexpected results during your experiment

Example of Project Experimental Log:

Date:	Time	Procedures/ Observations

EXPERIMENT

a. MATERIALS

The materials list is a complete list of all materials including details and amounts. Be sure to include quantities (how much), length, volume, and mass. List these in metric units. Be specific in your description of each item.

The Material List should follow these rules:

1. Be specific to amount, size and length.
2. Listed in metric units where appropriate.

Example of a Material List:

Bad Materials List	Good Materials List
magnet	1 large all-metal bar magnet
paper clips	225+ small metal paper clips
refrigerator	1 refrigerator
thermometer	1 metal dry bulb thermometer
hot plate	1 hot plate with low, medium, and high settings marked
	1 hot pad
	1 pair tongs
	1 stop watch

Fill in the blanks below to create a quality Materials List.

Quantity:	Description of Item:

b. PROCEDURES
List the steps of your experiment. Do not use the words "I" or "you".

The Procedures should follow these rules:

1. Label each step with a number or letter.
2. Write your procedures in a step-by-step format
3. Be very specific with quantities, amounts and the order that things need to be done or completed.

Example of a Procedure:

The procedure should be very clear and precise, written step-by-step. You should be very specific; don't assume that the reader knows how much, how many, or how long. Another person should be able to closely duplicate the project by following the steps in the procedure. You should have someone else, who doesn't know what you are doing, read your procedure. The procedure may need to be revised based on feedback from that person to make it more easily understood.

An example of a procedure for the magnet question:

1. Assemble materials.
2. Make a pile of 25 small paper clips
3. Measure the temperature of the magnet at room temperature by laying the bulb of the thermometer against the surface of the magnet and leaving it there for 60 seconds.
4. Record the temperature.
5. Use the magnet to pick up paper clips from the pile. Lift the magnet into the air and hold it there. After 10 seconds count and record the number of clips that stayed connected to the magnet.
6. Put these magnetized clips away. They will not be used again.
7. Repeat steps 2-6 two additional times for a total of three trials.
8. Place the same magnet into the freezer compartment of a refrigerator for 10 minutes.
9. Make a new pile of 25 small paper clips.
10. Measure and record the temperature of the magnet as described in steps 3 and 4.
11. Use the magnet to pick up paper clips from the pile. Lift the magnet into the air and hold it there. After 10 seconds, count and record the number of clips that stayed connected to the magnet.
12. Put these magnetized clips away. They will not be used again.
13. Repeat steps 8-12 two additional times for a total of three trials.
14. Plug in the hot plate and turn it on to medium heat. Let it heat up for 5 minutes.
15. Place the same magnet onto the hot plate. Leave it there for 3 minutes.
16. Make a new pile of 25 small paper clips.
17. Using the tongs, pick up the magnet and lay it on the hot pad. DO NOT TOUCH THE HOT MAGNET.
18. Measure and record the temperature of the magnet as described in steps 3 and 4.
19. Using the tongs, pick up the magnet and use it to pick up paper clips from the pile. DO NOT TOUCH THE HOT MAGNET. Lift the magnet into the air and hold it there. After 10 seconds, count and record the number of clips that stayed connected to the magnet.
20. Put these magnetized clips away. They will not be used again.
21. Repeat steps 15-20 two additional times for a total of three trials.

Fill in the blanks below to create quality Procedures.

Procedures:

1) _____

2) _____

3) _____

4) _____

5) _____
6) _____
7) _____
8) _____
9) _____
10) _____
11) _____

c. DATA
Show what you observed during the experiment. You may use drawings to help show what you observed. As a result of the experiment, data should be collected and organized in tables and/or graphs. Both tables and graphs should have titles and the graphs should have the x and y axes labeled. A key should be included for the graphs. You should be able to explain orally what the tables and graphs show and how they relate to the project.

Website you can use to create tables and graphs:
http://nces.ed.gov/nceskids/createagraph/

d. RESULTS
Tell about your data. Tell about what you observed. Even if your data shows that your guess was not right, your project is still good.

You should organize the data into a table and select an appropriate graph(s) to display that data. You will then write a written summary of the results of the data. Your summary must include:

a) Does the data show a relationship or reveal some pattern?
b) Is there a sizeable or significant difference between any of the groups?
c) What possible sources of error are there?

Did something unexpected (an uncontrolled variable) affect the results of the experiment? For example: "While conducting the experiment on temperature affecting magnets, a phone call interrupted trial #3. So, the heated magnet wasn't tested for several minutes after measuring its temperature. The magnet may have cooled considerably before testing it with the paper clips. The number of clips it picked up was somewhat less than on the other two trials with the magnet heated (7 clips compared with 9 and 10 clips)."

Your results should follow these guidelines:

1. Include what you wanted to accomplish and prove during your experiment.
2. Describe and write what you discovered. Be sure to include any data that might have been collected. It is important to show this data even if it did not support your hypothesis. The process of completing the experiment with true data is what is important.

3. The purpose of the results section is to present your key results.

Fill in the blanks below to create a quality Results section.

The original purpose of this experiment was to _____
_____
_____

The results of the experiment were _____
_____
_____

A possible source of error might be _____
_____
_____

e. CONCLUSION

Use one or two sentences to tell about all the results of your experiment. In this section, you will discuss what your project is proved.

- Was your hypothesis correct or not?
- What is the answer to your question based on the data you collected?

DISPLAY BOARD

You don't have to use a fancy display board; one can be made out of cardboard or poster board.

The display should be neat, organized, and easy to read. It should be visually appealing.

The display should have a catchy title that relates to what the experiment is about.

Photograph, pictures, and diagrams may be included to help show what was done.

All parts of the scientific method should be included on the display. Each part should have a label:

a) Question
b) Research-a short paragraph telling what you learned about the topic through your research (**this should be in your own words; cutting and pasting from the Internet IS NOT acceptable**)
c) Hypothesis
d) Materials
e) Procedure- with amounts and numbers of each item
f) Results-including the tables and graphs that show the data
g) Conclusion

SOURCES

List all books, articles, and other sources that you used for your research. You may also interview experts to help with your studies. If you type in your bibliographic information into the website, www.citationmachine.net, it will create entries automatically in **APA format**.

DCSS Grades 3-5 Science Fair Exhibit/Safety Guidelines

EXHIBIT SPACE: Maximum size is: Width: (side to side) 92 cm (36.in) Depth: (front to back) 76 cm (30 in.) Height: Table Exhibit 92 cm (36 in.)

1. Anything which could be hazardous to the public, the exhibitor, or other exhibitors (including sharp, pointed objects) is **PROHIBITED**

2. Organisms: **No organisms** may be displayed! This includes any vertebrates, invertebrates, fungi, bacteria, or **plants**. For example:

    - No owl pellets, No mice (live or dead), No fish (live or dead), No insects (live or dead), and No skeletons

- Microbial cultures- No bacteria, live or dead
- No Fungi (including bread mold), live or dead
- No parasites, human or other, live or dead
- No live plants are allowed with the display!

3. Chemicals: No chemicals may be displayed. For example:
   - No acids or bases, dilute or strong
   - No salt solutions
   - No insecticides or repellents
   - No mercury
   - No medicines, vitamins, over-the-counter drugs
   - No uncovered liquids of any type
4. Flammable substances: No flammable substances may be displayed.
   - No gases
   - No flammable liquids or solid rocket fuel
   - No fumes

An alternative solution to displaying the above items: Take photographs of the substances that were used or use a digital camera and create large pictures with a computer printer for display on your board. No identifiable humans or their parts may be displayed in photos.

All projects will be inspected for adherence to Science Fair Safety Guidelines by the classroom teacher or the school Science Fair Committee.