**Mallard Creek Elementary**

**Presents the 2014 - 2015**

Student’s name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_





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**Important Science Fair Dates**

October 7th ~ Project Begins

October 14th ~ Project Question Due

December 15th ~ Project Display Boards Due at School

Thurs., Jan. 8th ~ Science Fair Night



October 7th, 2014

Dear Parents and Families,

Your child will be taking part in a **Science Fair Homework Project** that encourages students to think like a young scientist! During the next few weeks each third, fourth and fifth grader at MCES will be designing a science project that uses the scientific method to solve a problem. The scientific method is a focal point in our science curriculum. Participation in the fair helps your child meet these educational goals as well as helping your child discover new areas of interest, practice problem solving and critical thinking, and gain a sense of pride in successfully organizing and completing a project. The projects must be completed at home. **Please understand that this project is mandatory and it is weighted as three formal science grades.**

We ask that you support and encourage your child as well as monitor his or her progress along the way. **Start off by reviewing the project directions and homework timelines with them. When you have approved of your child’s topic, and viewed the general rules and forms at the North Carolina Science and Engineering Fair , please sign page 8 and return it with your child to school on Tuesday, October 14th for 10 points.**

Remember you can guide your child whenever and wherever you can, but let the final project reflect your child's individual effort and design. We have attached a scoring sheet so students can see what we are looking for in each category.

**Since** we would like to anticipate the regional science fair competition sponsored by the NC Science & Engineering Fairwhich is an affiliate of the Intel International Science & Engineering Fair this year**, we wanted to keep you informed that we need student’s projects to adhere to very specific sets of guidelines. The student must submit all required forms at the regional fair only if the project is selected by the committee. Some forms are required BEFORE the experiment. We ask you to review all the rules and complete forms online before the experiment as a part of this project. The forms can be filled out online in pdf format.**

**The final project is due at school Monday, December 15th .** Students will be giving classroom oral presentations with their projects that week. *Please do not bring projects to school prior to Monday, December 15th*. **The project will culminate during “The 5th Annual Science Night” at Mallard Creek Elementary on Thurs., January 8th.** All students, staff, parents and families are invited to come and see our science fair and other classroom projects on display at this time.

There will be web links for resources and information to print at home to help your student during this project on the grade level websites soon. If you have any further questions contact your teacher. We look forward to watching your child enjoy this unique opportunity for scientific discovery!

Sincerely, MCES Third, Fourth & Fifth Grade Teachers

**Student Directions:**

**7 Step Approach to the Scientific Method**

**and Research Plan directions**

**Step 1: QUESTION**

* Answer the question: What topic do you want to learn about? Think about a question that you wonder about like “I wonder how that works?” or “I wonder what would happen if …” or “I wonder what that is?” Any of these can be the basis of your topic. Make sure your question is something that can be tested or measured and answered using the scientific method.
* **Example: I wonder if different color of light bulb will change the growth of plants.**

**Step 2: RESEARCH**

* Once you have decided on a topic, you should research it carefully by finding out everything you can about the topic. Use reliable Internet sources, books from the library, your science book, or other resources. Keep all the information that you find in a research folder or notebook.
* You must have a **minimal of 3 resources on the bibliography**.
* **Example: Research how different color light bulb affects the plant growth and etc.**

**Step 3: HYPOTHESIS (IMPORANT!!!)**

* Predict the answer or outcome to the problem. Think about what was one thing being tested or changed in your experiment. **Avoid using first or third person’s point of view to form your hypothesis.**
* Follow this format to state the hypothesis**: : If** plants( name of the plant used) need a light source to grow**, then** plants will grow taller under the natural color of a light bulb **rather than** the red color of a light bulb **because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (The reason will be based on the conclusion or inferences from your research since you are giving a reason that is likely to support your outcome!!!)**
* **Step 4: EXPERIMENT**
* Design an experiment/test for the project to confirm or disprove your hypothesis. Ask yourself “What kind of test can I design to confirm what I think will happen?” List the steps of the experiment so another person could repeat the experiment. To do this use a series of steps called the scientific method. (This is the same format we use for all of our school science experiments.)
* **Know your variables- what is used, changed and what is being tested in your experiment**.
* **Example**: Based on the hypothesis from above your **Independent Variable** is what you can change or control such as the amount of water used, length of light exposure and the color of the light bulb. **Dependable variable is what you measured from this experiment** such as the growth rate or the height of the plant.
* **Avoid using first or third person’s point of view to describe the steps.**
* **Describe the procedure in a detailed, measureable, and quantified manner. Unify the unit of measurement in METRIC SYSTEM such as ml, gram, meter, Celsius, or etc.**
* Example: **10 ml of tap water** was added to a glass measuring cup with **0.5 grams of baking soda** at the room temperature of **22 C degree.**
* **You need to set up an experiment in two groups: Control Group- this will allow you to compare the result with the experiment group** such as using the natural sunlight as a light source**; Experimental Group- will be the group that you apply different independent variables** such as yellow, red, and blue light bulb**.**

**Step 5: DATA**

* Record your data using charts, and graphs, and pictures. **Include only the figures and diagrams related to your data.**
* **If your experiment happens to use human participants, please do not include your subjects (human participants) in the pictures.**
* **Repeat multiple times to collect a reliable and large data pool .**

**Step 6: RESULTS**

* Report what happened during the experiment (data) in paragraph form such as patterns, changes, trends, or differences among your data sets.

**Step 7: CONCLUSION** From the results of your experiment, draw a conclusion. Was your hypothesis **supported or not supported**? What could you have done differently?

**The Final Project Step: Display Your Project Results**

* Use a tri-fold display board (available at Wal-Mart and office stores)
* Use pictures, charts, and graphs when displaying information. Make sure all diagrams and charts are neat. Use a computer to generate graphs and charts
* Be sure your work is neat and free from errors such as misspellings.
* Use contrasting colors to make your display more visually appealing.

**Section Headings to Include:**

1. **Question**(The title of your experiment)
2. **Hypothesis** (What you think will happen and why)
3. **Materials** (List of all materials needed to complete the project)
4. **Procedure** (Step by step directions of how to set up & do the project)
5. **Data** (Make charts or tables, use graphs, pictures and photos.
6. **Conclusion** (Be sure to look at your hypothesis and answer your question. Be sure to refer to data you collected from your experiment.
7. **Next Time** (What you would change if you did this experiment again) **VERY IMPORTANT: Your name, grade and teacher’s name need to be on the back of your board; do not write them on the front. If you don’t have this, it will not be graded.**

**Research Plan and abstract**

**You need to submit a typed research plan and abstract with your display board.**

**Your research plan should reflect what was actually done for your project and the details should match what is written in your abstract.**

**Must include:**

**Question or problem being addressed**

**Hypothesis/Engineering Goals**

**Detailed description of methods or procedures**

**An abstract is written after experimentation in 250 words only and includes:**

**a) purpose of the experiment**

**b) procedure**

**c) data**

**d) conclusions**

**SCIENCE FAIR HOMEWORK CALENDAR**

**October 2014**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Monday | Tuesday | Wednesday | Thursday | Friday |
|  | 7  What topic do you want to learn about? Choose your topic. Begin learning about your topic. Use reliable Internet sources, books from the library, your science book, or other resources.  **Project directions sent home.** |  |  |  |
| **Tell your teacher what your topic question is and get approval of your hypothesis.**  **View all NC SF rules and forms on line.** | 14 | Decide how to set up your experiment. Write your research question **and hypothesis. Write the materials and procedure** for your experiment.  Read it to your family and make sure you have listed every step. |  |  |
|  | 21 |  |  | 24 |

**SCIENCE FAIR HOMEWORK CALENDAR Oct/Nov 2014**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Monday | | Tuesday | | Wednesday | | Thursday | | Friday | |
| **Conduct the experiment** and **record data**. Analyze your data. Include charts, graphs, tables, averages, etc. Remember to take photos or draw pictures to document your experiment if appropriate. | | 28 | |  | |  | | 31 | |
| **Conduct the experiment** and **record data**. Analyze your data. Include charts, graphs, tables, averages, etc. Remember to take photos or draw pictures to document your experiment if appropriate. | | 4 | |  | |  | |  | |
| **Conduct the experiment** and **record data. Write your conclusion**. Was your hypothesis correct? Tell what factors may have influenced the outcome and what you would change next time. **Write what you would do next time.** Begin making your project board.  **Complete and type your research plan and abstract.** You need to type your **abstrac**t at [**https://member.societyforscience.org/document.doc?id=24**](https://member.societyforscience.org/document.doc?id=24) | | 11 Veteran’s Day | |  | |  | | **14** | |
|  | |  | |  | |  | |  | |
|  | 25 | | **Holiday** | | **Holiday** | | **28 Holiday** | |

**December**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Monday | Tuesday | Wednesday | Thursday | Friday |
|  | 2 |  |  |  |
|  | 9 |  |  | 12 |
| 15 **Projects due at school**! | **Final Science Fair Projects due Monday, December 15th.**  Finish making your display board and practice giving your science fair presentation. |  |  |  |
| **January** |  |  |  |  |
| **Monday** | Tuesday | Wednesday | Thursday | Friday |
| **5th** |  |  | 8th  **Science Fair Night at 6:00 – 7:30** | 9th |

|  |  |  |
| --- | --- | --- |
| **Date:** | **SCIENCE FAIR HOMEWORK TIMELINE** | **Student: Check when completed** |
| October 7th  Oct. 14th | Project directions sent home. Choose your topic. Begin learning about your topic by researching online or at the library. **Decide on your experiment question, hypothesis, and have your parent's signature by October 14th, 2014.**  **My experiment question is:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **My hypothesis is:\_If\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_then\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **than\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ­­­­­­­­­­­­­­­­­­­­**  **because\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **I approve of this project and I have reviewed the project directions and timeline with my child.**  **I also view the rules and understand the forms on line that are needed to complete prior to my child’s experiment.**  [**http://www.ncsciencefair.org/index.php/students-a-parents/rules--**](http://www.ncsciencefair.org/index.php/students-a-parents/rules--) **select forms from the left hand side as well after viewing the rules**  **Please save a completed Approval form on line at home ( 1b).**  **Elementary projects involving the culturing of microorganisms are NOT ALLOWED**, with the exception of the following:  Experiments using Baker's/Brewer's yeast (bread yeast)  Experiments using lactobacillus or probiotic cultures (yogurt, buttermilk, or commercially available probiotic supplements)  Microorganisms include, but are not limited to: bacteria, fungi (including molds), yeasts, viruses, viroids, prions, rickettsia, and parasites. ALL projects involving microorganisms must follow the ISEF Rules regarding culturing, handling, and disposal. NO STUDENTS AT ANY LEVEL may grow microorganisms at home, except for those specifically stated as exceptions above.  X  **Parent/Guardian Signature (10pts) Date** | Teacher Initials when approved: \_\_\_\_\_  ❑ completed   completed   completed |
| 10/14 – 10/21  (1 week) | **Decide how to set up your experiment**. Write your research question and hypothesis. Write the materials and procedure for your experiment. Read it to your family and make sure you have listed every step. | ❑ completed |
| 10/21 – 12/5 | **Conduct the experiment and record data**. *(Note: If you are doing an experiment that takes lots of observation over a period of time, you may need to begin the project early).* Analyze your data. Include charts, graphs, tables, averages, etc. Write your conclusion. Was your hypothesis correct? Tell what factors may have influenced the outcome and what you would change next time. Remember to take photos or draw pictures to document your experiment if appropriate. | ❑ completed |
| **Dec. 4th – 14th** | **Make the display board.** Use your computer skills to make it look nice if you can! ☺ Include color drawings or photos of your graphs, data, and project. Mount them nicely for an attractive looking display. Consider a hands-on display (3-D model) if appropriate.  **Type your research plan in a word document and an abstract on line at**  [**https://member.societyforscience.org/document.doc?id=24**](https://member.societyforscience.org/document.doc?id=24)  **Please refer the directions and rubric.**  **You can always start this part early and never wait until the last minute. Plan, plan, and plan ahead!** | ❑ completed   completed-  **Research**  **Plan**   completed-  **Abstract** |
| **Dec. 15th**  **Projects are due** | **Bring the following :**   1. **Display Board** 2. **Typed Research Plan** 3. **Typed Abstract**   **to school on December 15th.**  ***Both 2 and 3 worth total 100 points.***  Thursday, January 8th is the “Science Fair Night”.  **6:00 – 7:30 PM** | ❑ completed |

**\*Students: Remember to bring this form to school on these dates**

**Science Fair Display Board Scoring Criteria**

Scientist: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | **Points Earned** | **Points Possible** | **Comments** |
| **Question** - The title of your experiment. Write a question that you can answer by conducting an experiment. |  | 10 |  |
| **Hypothesis** – This is a prediction or educated guess on what you expect will happen (the predicted answer your question). You must state your hypothesis in a way that it can be tested. Give any background knowledge you have about the topic. |  | 10 |  |
| **Materials** – Give a complete list of materials needed to perform the experiment. |  | 10 |  |
| **Procedure** – Step by step directions to conduct the experiment are listed. State very clearly and in great detail how you plan to conduct your experiment. Write everything down in step-by-step fashion.  Be sure to test no more than one variable. |  | 10 |  |
| **Data** - Include data charts, tables, diagrams, graphs, drawings and/or photos to document your experiment or results. |  | 10 |  |
| Conclusion - Look at your hypothesis and answer your question. Refer to data collected from your experiment. Tell what you learned from this experiment. Did your experiment answer your question? Is your hypothesis correct? If not, give a reason why your experiment turned out the way it did. Tell what new questions could be answered as related to your science experiment. |  | 10 |  |
| **Conventions** (Spelling, capitals, punctuation & grammar) Your final copy should be free of all errors. |  | 10 |  |
| **Language** – This project must be written in the student’s own words. **Do not** copy text from any sources (books, Internet, etc.). In other words, students should not print information from a web site or photocopy from a book and glue it onto their project display. |  | 15 |  |
| **Overall Neatness & Aesthetics of the Display** |  | 15 |  |
| **TOTAL POINTS EARNED** |  | **100**  **Possible** |  |
| **Bonus** – Hands on display, report, extra research, going above and beyond, etc. |  |  |  |

**Research Plan and Abstract Rubric**

**Scientist:\_\_\_\_\_\_\_\_\_\_\_\_**

**Directions:** Please use complete sentence to type your plan. Please use 12 point font size in Times New Rome in 1.5 line space. Please include the title of your project and proper heading. You need to complete abstract on line and print the paper to submit to your teacher. **Total Score:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |
| --- | --- |
| **Heading** | **Points** |
| **Abstract –All requirements** | 25 |
| **Question or problem being addressed** | 15 |
| **Hypothesis/Engineering Goals** | 20 |
| **Detailed description of methods or procedures** | 20 |
| **Conventions/ Signed page 8** | 10/ 10 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Content** | **Organization** | **Language** | **Delivery** |
|  |  |  |  |

**Science Fair Presentation**

**Speaking Scoring Guide**

(Criteria needed to meet the standard = 4)

|  |  |
| --- | --- |
| **Ideas & Content** (Score 4)  The speaker’s message is clear and sticks to the topic.  The speaker:   * Has clear main ideas and purpose. * Has details that go with the topic, but they may not be consistent or strong. * Makes adequate connections or conclusions but may consider only one viewpoint. * Uses resources, when appropriate, to provide accurate support. | **Organization** (Score 4)  The speaker organizes the message in a clear but obvious or ordinary way.  The speaker:   * Has an effective introduction that leads to the main ideas. * Places ideas and details to make the message easy to follow. * Has transitions that work, but may be ordinary. * Has a planned conclusion that may be ordinary but still matches the message. |
| **Language** (Score 4)  The speaker uses language that helps make the message clear.  The speaker:   * Uses words that communicate the speaker’s message clearly. * Uses words that communicate the speaker’s message but may not paint a picture in the listener’s mind. * Uses slang, when appropriate, and technical words in a way that does not take away from the message. * Makes a few mistakes in the use of words and grammar, which are not distracting. | **Delivery** (Score 4)  The speaker shows satisfactory skill in speaking to an audience.  The speaker:   * Makes eye contact with most of the audience. * Speaks clearly and correctly and uses a rate, volume and tone that are appropriate to the audience and message. * Has a delivery that is usually smooth; some breaks or pauses, but not enough to hurt the message. * Uses gestures and facial expressions to help explain the message. |