SCIENCE FAIR

September 28, 2017

Dear Parents/Guardians,

 At Triangle Math and Science Academy, students in grades 4th -11th will take part in the Science/STEM Fair. This is an exciting event that encourages students to think like young scientists, engineers, mathematicians, and/or technologists. During the next few weeks your child will be designing a project that uses the scientific method to solve a problem. We hope you agree that the educational benefits are numerous, as students develop skills in writing, oral presentation, creative thinking, and problem solving. **All students in grades 4th – 11th grade are required to complete an individual science fair project. The science fair project will count towards a science grade.**

 Attached, you will find a description of the components that must be included on the final Science Fair project display. In order to insure that our students will be successful with this project, he/she will record their information in their **Science Investigation Journal** and submit their journal on the correct due date to their teacher for approval. If a section is not approved, the student will need to make the necessary changes and re-submit it. **Please note the journal is for planning purposes and will not be part of the final project.** **The pages of your child’s Science Investigation Journal are not to be used on the final display board. The Science Investigation Journal is a way for your child’s teacher to keep track of your child’s progress and as a resource for you and your student during their science investigation**

If you have any questions, please contact Mrs. Ingram, our Science Fair Coordinator, via email at aingram@tmsacademy.org, or Ms. Smiley, your child’s science teacher, at ksmilowski@tmsacademy.org . Thank you in advance for your support and time.

Topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent Signature -\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­

** Important Dates **

 **Project Timeline**

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| --- | --- | --- | --- |
|  | **DUE DATE** | **ASSIGNMENT (S)** | Check off when completed or graded |
| Send out Packets | Monday 9-25-17 | Review Packet, begin brainstorming topic |  |
| **October** | Tuesday10-3-17 | **CHOOSE YOUR TOPIC**Turn in parent signature forms to your science teacher |  |
| **October** | Tuesday 10-10-17 | Write question/ Hypothesis |  |
| **October** | Tuesday10-24-2017 | Write a Research Plan**Problem(Question)** **Hypothesis****Materials****Procedures** |  |
| **October - December** | 10/24/17 to 12/12/17 | You should be working on your experiment.Ask teacher for guidance if needed |  |
| **December** | Tuesday 12-12-17 | Final reports are due for grading\*work on tri-fold board and class presentations over Winter Break |  |
| **January** | Week of Tuesday1-9-18 | ***STUDENTS WILL PRESENT PROJECTS TO CLASS***  |  |
| **January** | Saturday 1-20-18 | STUDENTS WILL PRESENT PROJECTS TO JUDGES CAMPUS SCIENCE FAIRNo Parents allowed |  |
| **February** | Saturday 2-10-18 | Regional Science FairHillside High School in Durham, NC |  |
| **March** | Saturday3-24-18 | State Science FairNC State University in Raleigh, NC |  |
| **May** | TBD | International Science and Engineering Fair Competition |  |

**Parts of the Project**

***The following section gives a brief description of each part that needs to be completed when conducting your science investigation. Please refer to your Science Investigation Journal for more detailed instructions.***

**Question:** the question should run an experiment in which something is modified and the result can be recorded.

 *Example: Could the amount of sunlight affect the growth of a plant?*

**Hypothesis** (prediction): A prediction is a tentative answer to a question that is investigated. The prediction forms a reasonable calculation about the result of the experiment and proposes a possible reason for your results. The prediction must be based on previous knowledge, observations or investigations and it’s checked to see if it’s found to be true or false during the investigation. Scientists use the word “Hypothesis” to refer to a prediction.

*Example: if a plant is given sunlight and another plant is not given sunlight,*

***THEN*** *the plant that doesn’t receive sunlight will not grow as tall* ***BECAUSE*** *it will not have the* sufficient energy to do so.

**Materials:** list the materials that you have used in your investigation.

**Variables:** what is changing? Identify your independent/dependent variables and constants.

**Procedure:** The procedure includes all the steps that were followed to organize and recollect the data. The procedure is written in a clear and sequential form, so that other people can follow these steps for the experiment. Number each step and clearly state how you went about conducting your experiment.

**Data:** Graphs, tables, and registry of notes, pictures and or drawings must be used to explain the results to the reader. Every science fair project must display data in the form of a graph or table.

**Conclusion:** The results of the experiment include the means taken, and the observations realized. This must include a written explanation of the results, the data that was observed and the media that was used for the experiment.

**Research Paper:** Each Student is required to complete a research paper that gives background information on their topic. Please use your Science Investigation Journal to assist in completing your research paper. **Every student must complete a research paper.**

**Sample Science Fair Project**

**Students will be provided two file folders to create a mini science board.**

**If student moves on to school Science Fair, then a standard science trifold board will be required.**

* Your display must include everything required. It must be organized in the correct order on the board. It must be neat, attractive, and easy to understand. Pictures and drawings make it more interesting. A chart or graph is highly recommended.
* Your display board must be sturdy enough to stand up by itself. It must fit on a table.
* There must be no identifying information on the front of the display. Your name, your teacher’s name, your school’s name, and pictures that show faces cannot be on the front of your display. **Write ALL IDENTIFYING INFORMATION on the BACK** of your display or attach a card at the bottom back with the following information: Teacher name, Student name, Grade level, Title.
* The board must be organized like the following drawing:

Hypothesis

Results

Title

Question

Materials

Conclusions

drawings

photos

graphs

charts

Procedures

|  |
| --- |
| Science Fair Project Ideas*You may choose from this list, or create your own* |
| **Physical Science**1. Is there a relationship between the size and strength of a magnet?
2. What types of surfaces produce the greatest or least amount of friction?
3. What variables affect the flight of an airplane (materials, weight, shape, angle of launch)?
4. How is the bounce height of a ball related to the drop height?
5. What variables affect the efficiency of parachutes (size, shape, materials)?
6. How does temperature affect the bounce height of a ball?
7. What variables affect the distance a balloon rocket will travel (amount of air, nozzle shape,

 angle of ascent, different pathways)?1. Which type of material conducts sound the best?
2. Do different watt light bulbs produce different amounts of heat?
3. What effect does temperature have on buoyancy?
4. Does color affect the rate in which an ice cube melts?
5. What effect does color have on temperature?
6. What material makes the best heat insulator?
7. Which type of container keeps liquids hotter longer?
8. What effect does temperature have on the elasticity of a rubber band?
9. Do suction cups stick equally well to different surfaces?
10. Does the amount of stretch of a rubber band affect the distance a rubber band will travel?
11. What shape of container allows for greater rates of evaporation?
12. Does salt water or lemon juice have any effect on the rate of dehydration of different types of apples?
 | **Life Science/Environmental**1. What effect do different colors of light have on the growth of plants?
2. What type of seeds will germinate fastest?
3. Does the direction a seed is planted affect the growth of the seed?
4. Do vitamins or fertilizers affect the growth of plants?
5. Do mirrors have an effect on plant growth?
6. Does acid rain have an effect on the germination of seeds?
7. Which direction will a vine grow around its support object?
8. What medium works best for growing seeds or plants?
9. Does temperature affect the growth of seeds or plants?
10. Is there a relationship between seed size and fruit size?
11. Which fruits or orange drinks have the most vitamin C?
12. Do potato cubes gain or lose mass in salt water solutions?
13. What kind of soil is best for water retention?
14. How does a garden mist spray affect plant growth?
15. Which plants and vegetables make the best dye?
16. Which type of wildflower grows best under artificial light?
17. How does temperature affect the water uptake in celery plants?
18. Does the type of water affect the growth of plants?
19. Is soil necessary for plant growth?
20. How does rotation affect plant growth?
21. Does music affect plant growth?
22. Does a plant grow best in sunlight or artificial light?
23. Can plants deprived of sunlight recover?
 |
| Science Fair Project Ideas*You may choose from this list, or create your own topic* |
| **Earth Science*** The sun causes water to evaporate into the air, where it forms clouds and comes back down as rain or snow. Can wind speed, humidity, or temperature have an effect on the rate of evaporation? (Do one of these [**weather experiments**](http://www.hometrainingtools.com/weather-experiments/a/1311/) to find out more.)
* How good is soil at breaking things down? What can you find that is biodegradable? How can you test to see whether something is or not?
* What holds more water, sand or soil? How does this affect what kinds of plants can grow in each?
* Can you learn to [**predict the weather**](http://www.hometrainingtools.com/clouds-precipitation--weather-forecasting/a/1131/) from the clouds? Try using a [**cloud chart**](http://www.hometrainingtools.com/cloud-chart--wall-size-17x22/p/AS-CLOUD/) to make your own forecast every day for a few weeks. How accurate was the cloud-forecast method?
* You can also do an experiment to test different building designs for earthquake stability. Which designs are most stable?
 | **Websites****The following are websites that students can use as resources to assist them when completing their science investigations*** <http://www.all-science-fair-projects.com>
* <http://www.sciencebuddies.com>
* [www.education.com/**science**-**fair**/**elementary**-**school**/](http://www.education.com/science-fair/elementary-school/)
* <http://www.ncsciencefair.org/index.php/teachers/timeline>
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#####  Science Investigation Journal

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Teacher Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Hypothesis: (Prediction**) What do you think will happen?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Materials:** What materials do you need in order to do this experiment?

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**Research:** What other information did you find about your topic?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Science Investigation Journal Cont.

**Procedure:** What steps will you follow to complete this experiment?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Observations: (Analysis)** What happened during your experiment? What data (information) did you collect? (chart or table?)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Conclusion**: Was your hypothesis correct? What did you learn from this experiment? What would you do differently next time? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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#### Science Fair Rules

1. Most of the work on your science project is to be done at home. Some teachers **may** choose to do a portion of the project, i.e. the written report, in class. This will be decided by each classroom teacher. Students may seek advice from teachers during designated times, but work on the project itself should be done outside school time.
2. All project must include the experimentation and data collected during the experimentation.
3. Use of live animals is discouraged. Any exceptions must be approved by the classroom teacher. Displays cannot contain any dead animals.
4. The science project should be made into a display with labels, lettering, pictures and/or an explanation of the project. Make the display attractive, interesting and easy to understand.
5. Projects should be done primarily by the student. Adult assistance is permitted and encouraged as mentioned earlier. Please remember this is your student’s project and it should be your student’s work.
6. There must be no identifying information on the front of the display. Your name, your teacher’s name, your school’s name, and pictures that show faces cannot be on the front of your display. **Write ALL IDENTIFYING INFORMATION on the BACK of the board**
7. Any questions should be directed to the classroom or science coordinator.
8. All experimentation is done at home. Students are only allowed to bring boards during judging. Students may bring items to model what was done but experiments ARE NOT DONE DURING JUDGING. NO GLASS IS ALLOWED!

**What Are Science Fair Judges Looking For?**

How do you know what makes a great science fair project? Here are some pointers for making sure you have a good project, based on what science fair judges are looking for in your project.

* **Be Original**: Try to come up with an original idea for your science fair project. Find a new way to test something or a fresh application for a product or a novel way to process data. Look at something old in a new way. For example, rather than compare different types of coffee filters, you could compare different household materials (paper towels, napkins, toilet paper) for use as coffee filters if you ever ran out.
* **Be Clear**: Have a well-defined, easy-to-understand goal or objective. Make sure the title of your project is related to your purpose. Make it crystal clear what you are doing and why.
* **Understand Your Science Fair Project:** It's not enough to have an easy-to-understand poster or presentation. Judges will ask you questions about your project, in part to see whether or not you understand what you have done. This weeds out people who basically had their parents, friends, or teacher do their project for them. You need to understand what you did, why you did it, and what conclusions you could make based on your results.
* **Time & Effort**: Science fair judges reward effort. You can get excellent marks on a science fair project that only took you an hour to do, but you should realize investing time and energy in your project will give you an edge over other good projects. A project does not need to be time-consuming or complicated, but one which requires you to collect data over time will do better than a project you whipped out in a weekend. Spending time on your project demonstrates your interest in it, plus taking the time to think about it usually means you come out of the project with a better understanding of how science works.
* **Answer Questions**: You can impress science fair judges by answering their questions politely and completely. Try to radiate confidence. If you don't know the answer to a question, admit it and try to offer a way you could come up with the answer. Here are some common questions asked by science fair judges:
* How did you come up with the idea for this science fair project?
* How long did you spend on the project?
* What background research did you conduct? What did you learn from it?
* Did anyone help you with the project?
* Does this project have any practical applications?
* Did you try anything that did not work or did not give you expected results? If so, what did you learn from this?
* What would be the next step in this experiment or study if you wanted to continue your work?