**East Cary 7th grade Inventors Fair!**

Put on your thinking caps because it is time to be an inventor! Students have been studying the Industrial Revolution in social studies and using the Engineering Design Process in their science class and now it is time to apply what they have learned and be creative problem solvers. Students will be researching and solving a problem though a new invention they create. Students will need to construct a prototype of the new invention, as well as put together a presentation display.

All projects are due **Tuesday, September 6, 2016**. Students from tracks 1 and 3 will present their projects to parents, staff, and classmates in the **evening of Thursday, September 8th from 5:00- 6:00** in the media center. If students cannot attend that evening, a parent note must be sent in by Tuesday excusing attendance.

Below is a list of student expectations (following the Engineering Design Process) for the inventors fair:

1. Ask: What is a problem that needs to be solved? What are constraints in solving this problem (limitations that must be considered)?
2. Imagine: Brainstorm different solutions to your problem. Research the topic your problem is trying to solve. Choose the best idea (keeping the constraints in mind).
3. Complete a patent application. **Due no later than Tuesday, July 19th.**
4. Design a plan for building your invention/innovation (hypothesis).
5. Maintain a scientist’s data journal (Project Log).
6. Complete a bibliography for all sources used.
7. Create a presentation display of required information.
8. Complete a Project Summary.

\*\*\*The Project Log and Project Summary will be turned in to your teacher.

**Glossary**

Topic: The subject of interest that will be explored. This should be something of student interest and to which he/she can relate.

Background Research: Learning about the topic by reading books, newspapers and magazines/journals, by watching TV or videos, or by interviewing knowledgeable people.

Problem: The specific problem that is going to be investigated. State this in the form of a question. What do I want to find out?

Hypothesis: An educated guess presuming the outcome of the invention. What will happen? How can I solve the problem? Should be written as an **if…………. then…………….** statement.

Experiment/ Design Plan or Procedure: A test designed to check your hypothesis and to create your new idea.

Variables:

**Independent:** The one thing in your experiment that you change in order to test your hypothesis. Ex. Number of blades on a turbine

**Dependent:** The factor that may change as a result of testing the independent variable. Ex. Distance it traveled

Constants: Everything that you keep the same while testing to ensure results are more valid. Example, same temperature water, same surface….

Control: The control group has no changes added. The data collected from the control group is used to compare with the experimental group.

Conclusion: A statement about the results of the plan and invention and how the results compared with what you thought would happen.

Project Summary: A detailed and specific description of the project. This should summarize the problem, what you did and the results.

Project Log: This is a record of all the activities related to your project and should include details of what happened during the process.

**The Scientific Method Display and Safety:**

In general, most displays and models will not have any problem following safety guidelines. However, anything made of glass and containers holding liquids could cause problems, and extra caution should be used. Please tell your teacher if you are using anything that could be a safety issue.

A display of the project work and model should address the following items:

* Invention Title
* Problem/need
* Hypothesis
* Materials
* Steps in designing/testing the invention
* Labeled diagram of invention
* Data table/observations and graphs (if applicable)
* Conclusions
* Project summary
* Pictures

You can choose to create your display using any format as long as it has been approved by your teacher and includes all required parts. If you choose to do a digital presentation, keep in mind there are limited plugs and resources in the media center. Tri-fold display boards are the most traditional format, but also the least creative.

If you choose to do a display board, use the following layout for your backboard. You need to make sure that the project summary is in the lower left hand side of the board. Your project model will be in the front of the board.

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**OR observations**

**Project Summary**

**PATENT APPLICATION**

**Due no later than Friday, Jan 10**

*What is your invention and what will it do? It can be an adaptation of something that already exists, but it must be a new creation.*

**I WOULD LIKE TO INVENT:**

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*What problem could be solved by using your invention? Who would this invention help?*

**THE REASON I CHOSE THIS IDEA IS:**

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My signature below indicates this is my idea and I am applying for a patent:

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STUDENT SIGNATURE AND DATE

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PARENT SIGNATURE AND DATE

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TEACHER SIGNATURE AND DATE

**Partner Request Form**

Parents and Guardians,

Students have the option to work individually or with one other person. In order for this project to be a success students who are working together will need to get together outside of the classroom to complete the work together. Please sign below to indicate you are willing to let your student work with someone else and coordinate times and transportation for this to be possible. Students will be given time in class to begin research, but the remainder of the project will need to be completed at home. This includes building the invention, completing science logs, testing the invention, and putting together the display. Projects are due April 15 in class, and students will present that evening from 5:30-6:30 in the media center. Please see the Inventors Fair packet for project guidelines and information.

**If you agree to allow your student to work with a partner please sign below:**

Student name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner’s name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner’s home phone number:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**If you want your student to work individually please sign below:**

Student name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**PROJECT SUMMARY**

The project summary is an overview of your project. Your summary should answer the following questions:

1. What was the problem I was trying to solve or the purpose of my project?
2. What was my hypothesis?
3. What were my procedures?
4. What were my results?

The summary must fit on no more than one page and should be written in paragraph form. An example has been provided below.

Project Summary Example:

*PROBLEM*

My dog, Macy, is always getting swimmer’s ear when we go to the beach. The purpose of this invention is to construct a device that will protect dogs from “swimmers ear.”

*HYPOTHESIS*

It was determined that dogs, like humans, get swimmer’s ear, which can be very harmful to them. Swimmer’s ear can cause ear infections and more. If a device could be constructed that would easily fit into the dogs’ ears, then it will keep his ears dry while he swims.

*PROCEDURE*

The device was constructed from an adjustable plastic headpiece which was part of a normal pair of ear muffs. Then a veterinarian was consulted to determine which material could be put in the dog’s ear that would be painless and harmless to the dog when it is inserted or removed. A type of ear plug was used. It was attached to the ear muff device and tried on different dogs under the supervision of the veterinarian. Looking at my data I collected none of the dogs gave any signal that it hurt to insert or remove and none of them developed swimmer’s ear when they went swimming.

*RESULTS*

This invention helps dogs with their owners because the dogs are protected from getting swimmer’s ear. This invention will allow the dogs to have fun in the water without their owners having to worry about them getting swimmer’s ear.

**What is a Science Project Log?**

The science logbook or log is a notebook or folder in which you record all of the steps and activities that took place during your project. It is the place where you will record **everything** that you do and read. All research notes need to be included in your log. You will record field measurements there, and you should present this as evidence of your work.

Keep it as neat as possible. The things you write in there should all be **dated**, so that the record is completely clear, and neatness is not so important as clarity. You will use the information in your logbook to complete your report/forms. It needs to be on display with your project during the science fair.

Your log is written as you go. There is **no need to make rough drafts**. Real logbooks show where they have been written in during brainstorms, and that is OK. Look after your log, but do not stress out if it suffers some minor scrapes and bruises.

Keep track of everyone you talk to and who helps you. You should keep notes of any interviews or phone calls you make, phone numbers and e-mail addresses, because you never know when you will need to e-mail a contact again - and computer systems can always turn nasty on you.

So make your book, label it, and start with a list of possible topics, and then move on to a timetable. Have a great time and remember that real science involves researching to find out what is already known, finding out what techniques to go and where to look, getting the equipment that is needed, and so on. You will need to do the same, **because every science project is real science.**

**To make your log book:** Take a piece of paper and make a cover sheet. The cover sheet should have your first and last name, class period, and teacher’s name on the front. Attach or staple around 10 pieces of notebook paper to the cover sheet. Some students may need a little more or a little less paper, and that is okay. Adjust as needed.

\*\*\*\*This can be done in a digital format (think blog style). If interested in other formats, talk to your teacher.