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

Put on your thinking caps because it is time to be an inventor! Students will be researching and solving a problem through 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 **Friday, September 2nd**. Students from tracks 1 and 3 will present their projects to parents, staff, and classmates on the **evening of September 7th or 8th** in the media center (the time is to be determined) If students cannot attend that evening, a parent note must be sent in by September 5th excusing attendance.

Below is a list of student expectations:

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 constraints in mind)
3. Complete a **patent application**: **due Thursday, July 21st

Then start your final product:**
4. **Design** a plan for building your invention/innovation (hypothesis).
5. Maintain a **Project Log: Due Friday, September 2nd**
6. Cite all sources used
7. Create a **Presentation Display** of required information **Due Friday, September 2nd**
8. Complete a **Project Summary: Due Friday, September 2nd**

**Glossary—Words You Should Use!**

**Hypothesis**: An educated guess assuming 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/Procedure**: A test designed to check your hypothesis and to create your new idea

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

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

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

**Project Summary**: detailed and specific description of the project--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.

**Presentation Display:**

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.

**The following should be on your display**:

* Invention Title
* Problem you are trying to solve
* Hypothesis (“If….then….” statement
* Materials
* Steps in designing/testing the invention
* **Labeled** diagram of invention
* Data table/observations and graphs (if applicable)
* Conclusions
* Project summary
* Pictures
* How the invention works!

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. Tri-Folds are the most traditional format.

If you choose to do a display board, use the following layout for your backboard.

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**Data Table and/or Observations**

**Possible Graphs or Tables**

**Project Summary**

**Conclusion**

**PATENT APPLICATION**

**Due no later than Thursday, July 21st**

*1. 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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*2. 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:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

STUDENT SIGNATURE AND DATE

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PARENT SIGNATURE AND DATE

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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 September 2nd in class, and students will present the evening of September 7th or 8th (times TBD) 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—Due September 2nd**

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?
5. The summary must fit on no more than one page

**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.*

 **Science Project Log—Due September 2nd**

1. The science logbook is a notebook in which you record all of the steps and activities that took place during your project.

**Examples (but not limited to):**

The project log must include **10 detailed entries with dates and thorough descriptions!**

--steps that you take/include dates

--people you talk to about the project

--drawings/diagrams

--timetables

--measurements

--conclusions

--problems

--data

**--ANYTHING YOU DO TO COMPLETE THE PROJECT--write it in your logbook!**

2. You will use the information in your logbook to complete your report/forms. **The logbook needs to be on display with your project during the science fair.**

3. **To make your log book:** Take a piece of construction 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 5-10 pieces of notebook paper to the cover sheet. Some students may need a little more or a little less paper--adjust as needed.