

Cheatham Hill Science Fair Guidelines 2021

The Basics

Title and Hypothesis Submission: Friday, March 5th

Projects Due in Media Center: Friday, March 19th

Awards and Project Pick Up: Friday, March 26th, Media Center

Prizes: 1st, 2nd, 3rd Place and Honorable Mention awards for each class K-5

Science Projects must utilize Scientific/Experimental investigation using the Scientific Method (see below)

* Models (including volcanoes and robots) cannot be accepted

* Projects involving bacteria and mold are highly discouraged, as they can be hazardous to student's health

Please Note:

All elements of the scientific investigation are expected to be age appropriate to the level of the student. The young scientist involved should be the primary investigator, however, parents are encouraged to *help* with both ideas and execution of the experiment on an age appropriate level. Ways to facilitate scientific exploration and learning include asking leading questions to steer the development of the ideas and concepts, acting as 'scribe' where necessary for legibility and record keeping and supervising the actual experiment and data collection.

Steps of the Scientific Method:

1. **Ask a 'valid' question:** what makes it *valid*?

- Does it have a specific answer?
- Can that answer be found using an experiment?
- Can that experiment realistically be conducted by me?
- Can I get the equipment, do I have enough time, can I understand the principles involved?

Your initial question or question ideas can be recorded in your *lab notebook*.

2. **Research your topic:** Discover basic background information that is already known – this will help you determine if you have asked a good question. Record what you find and where you found it in your *lab notebook*. Some of this information will go in your final write-up. If you find that you can not answer your question with an experiment at this stage you may be able to go back and modify your question into something answerable.

3. **Propose a hypothesis** – a good guess at what the answer to your question will be as shown by your experiments. The hypothesis should also be recorded in your *lab notebook* and be a prominent part of your display. A good hypothesis should clearly answer the question and be brief and to the point.

4. **Plan your experiment**, what materials you will need to conduct it and how it will be carried out. Write down the procedure you will follow in your *lab notebook*. Be sure to record each step carefully and be sure to follow it exactly.

- Note that meaningful experiments have both constants (things that don't change) and variables (things that do change) and that only ONE VARIABLE is changed at a time. Changing only one thing per experiment allows you to know exactly what caused any changes in the outcome of the experiment. It is also important to do each experiment more than once to be sure that the result is always nearly the same. Each time you do an experiment is called a trial. It is also good to have a 'control' which has no variables. It is useful to compare with other trials that do have variables, it gives you a 'baseline' result.
- When you make a list of equipment needed include specific characteristics that are important. For example if you require a "jar" specify glass, plastic or metal, large mouth or small opening and the approximate size.
- When you write up your final procedure keep it detailed but to the point and as clear as possible so it can not be misunderstood by someone trying to duplicate your experiment and get the same results.

5. **Conduct the experiment and observe the outcome** and record the datum or data for each trial in your *lab notebook*. Tables are helpful tools to record your data. Observations about each trial can also help in the final analysis so be sure to keep detailed records of what happens each time (observations).

- It is a good idea, where possible, to make at least three separate measurements when quantitative (numbers) datum is being measured (repeating each trial three times and taking the measurement each time). If your experiment has a more subjective result (is it frozen yet? How flexible is it? Is it sweet? or How does it smell?) multiple observers can remove some of the uncertainty, enlist a sibling or a parent or a friend to be an extra observer.
- When all the data have been gathered graphs or charts of the data can often show quickly and easily what the trends are. Think carefully about how best to meaningfully display your results so they are clear for both you and your project's observers.

6. **Summarize the results** of the experiments and draw conclusions from it. This should also be done initially in your *lab notebook*.

- What happened in your experiment?
- Does what happened support (prove) your hypothesis?
 - If yes, then explain how the data supports your hypothesis
 - If no, then explain why the data disproves your hypothesis
 - If the data is inconclusive (you can't tell if it supports the hypothesis or not or it shows something totally different) then explain why the experiments failed to prove or disprove the hypothesis. How could the experiment be modified to better determine an answer to your question? Do not assume that your project is unsuccessful if you have an inconclusive result – sometimes these types of results are as informative as more clear cut ones.

NOTE: The use of a computer to type up the report and elements of your display is acceptable, however the lab notebook should be hand written and any additional hand drawn or written elements on the display are sure indicators of student involvement in the project and are highly encouraged.

Why turn in your title and hypothesis?

Turning in the title and hypothesis for your project on March 5th will encourage you to make a start on your project and think about your experiment well in advance of the due date. It will also give the Science Fair team an idea of how many projects to expect and give you a chance to ask for suggestions or guidance from the team if you want to. Please submit the title/founding question, hypothesis along with your name, parents email, grade and teacher on a single sheet of paper sometime before March 5th in the Science Fair folder in the Media Center or email to chessciencefair@gmail.com

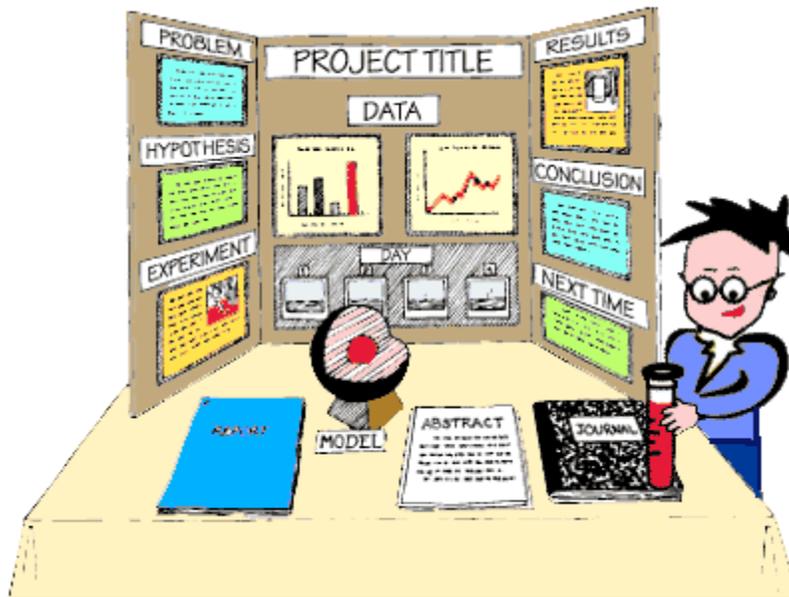
What is expected for your final project and display:

- A **tri-fold project display board** is the appropriate form of display for these projects. The display must be able to stand on its own without slipping or falling. They may also have items to be displayed on the table in front of the poster (the equipment used in the experiment, etc). The display should be no more

than 3 feet tall, 3 feet wide and 2 feet deep. **Oversized projects will not be accepted** because of space limitations.

- **A title** for the project must be clearly visible on the display. Your name should NOT be included on the front of the display. A card should be attached to the back of the display with the title, your school, your name, grade level, and teachers name.
- **Your hypothesis** should also be a prominent feature of the display
- **Tables, charts, and/or graphs of your data** that make it easy to see the results at a glance should be included in the display. Photos may be included as well as diagrams explaining the science behind the project or the experimental equipment.
- Simple forms of your **summary** and **conclusions** are also helpful for the observer to fully understand your project.
- The display should be **neat and easy to read**, but can also be colorful and creative.
- Along with the physical display of the project the handwritten **lab note book** kept during the planning and execution of the investigation should be included with a **write-up containing the following sections:**
 - a title page (remember DO NOT include your name on this page),
 - your valid question for investigation, the important points of the research you conducted,
 - your hypothesis,
 - the experimental plan including a detailed list of materials and the procedure,
 - the results of the experimental trials,
 - a summary of the results and the conclusions drawn from those results and any relevant discussion.

At the end there should be a short acknowledgement section in which you give credit to and thank the person or people who helped in your investigation and a bibliography of the sources used in your research.



CHES Science Fair 2021

Title and Hypothesis Submission Form

Student Name: _____

Grade: _____ Teacher _____

Parent Name and Email address (required) We would like to let you know if your child has a top scoring project!

Proposed Title of
Project: _____

Hypothesis: (what you think your experiments will show you – this will be on your display as well)

What will your variable be/ what will you be testing?

Email hypothesis to chessciencefair@gmail.com before Friday, March 5, 2021