# Science Fair Planning Guide

Get ready to become a scientist by creating your very own science fair project! Use this packet to help you keep track of deadlines, find helpful resources, understand presentation guidelines, and more!

Before you get started, be sure to recruit an adult to help you along the way with your project.

**My Name:**

_____

**My Adult Assistant:**

_____

**My project is due on:**

_____

Dear Parent(s) or Guardian(s),

Science Fairs involve students in the practice of Science and Engineering, requiring them to apply those skills to a topic of interest to them. Exploring and hands-on experience is the key to understanding and excelling in science. Our school's Science Fair will be held on **Tuesday, January 12, 2021**.  The Science Fair projects will need to be brought to the school by **Monday, January 11, 2021**.  No Science projects will be accepted after Tuesday, January 12, 2021.  **All students have been invited to participate, with Gifted (TAG) students in grades 1-5 being required to participate.**  Hands-on investigation and invention are the focus of our particular Science Fair.  Your projects will be due for display on the following date: **Monday, January 11, 2021.**

Please note that the bulk of the work will be done at home independently by students. **Students will be provided with project guidelines and timelines, and teachers will check in with them periodically.**  However, much of the work is **self-directed and the student will complete the bulk of the projects independently of the teacher**.  Parents are encouraged to offer emotional support and reminders, but to allow children to do the projects by themselves. **If your child is interested in completing a Science project for the Science Fair, please sign the bottom section and return it to the teacher by scanning and emailing the signed copy.**

*__Project Timeline:__*

**Week of October 26, 2020** – Begin thinking about the project topics/questions and acquire a journal

**Week of November 9, 2020** – Officially formulate a research question, develop a hypothesis, and begin background research

**Week of November 30, 2020** – Use this time to formulate a plan for an experiment and conduct the experiment; observe and collect data (with adult guidance)

**Week of December 7, 2020** – **Journal Checkpoint** – An adult checks for research information, progress, data collection, etc.

**Week of December 14, 2020** – **Journal Checkpoint** – An adult checks the journal for research information, progress, data collection, etc.

**December 28, 2020 – January 8, 2021** – Use these weeks to finish analyzing data, finalizing the journal, writing the abstract, writing the final report, and creating the project presentation board (with adult guidance)

**Projects due Monday, January 11, 2021**

**Week of January 11, 2021** – **School-wide Science Fair**; Students interviewed by judges, projects are judged and scored

**Week of January 18, 2020 – Winners will be announced**

***IMPORTANT REMINDERS***

*Elementary students may not conduct research involving human participants (surveys included), vertebrate animals, potentially hazardous biological agents or DEA-controlled substances.*

*For 4<sup>th</sup> and 5<sup>th</sup> graders, log books are required for the county fair, and judges prefer the traditional hand-written log books.*

# Georgia College & State University
# K-5 State Science Fair Categories

- ☐ Animal Sciences

- ☐ Behavioral and Social Science

- ☐ Biochemistry

- ☐ Biomedical and Health Sciences

- ☐ Cellular and Molecular Biology

- ☐ Chemistry

- ☐ Computational Biology and Bioinformatics

- ☐ Earth and Environmental Sciences

- ☐ Embedded Systems

- ☐ Energy: Chemical

- ☐ Energy: Physical

- ☐ Engineering Mechanics

- ☐ Environmental Engineering

- ☐ Materials Science

- ☐ Mathematics

- ☐ Microbiology

- ☐ Physics and Astronomy

- ☐ Plant Sciences

- ☐ Robotics

- ☐ Systems Software

# Display & Safety Regulations

**PER SAFETY REGULATIONS**

The following items **<u>CANNOT</u>** be displayed at a GSEF project:

- Living or dead organisms, including fungi, animals, plants, and microorganisms

- Taxidermy specimens, parts, pelts

- Preserved vertebrate or invertebrate animals or animal parts, including cells

- Human or animal food of any kind

- Human or animal parts or body fluids (including bones, urine, bloodstains)

- Plant materials including potpourri, grain, birdseed, spices, leaves, flowers, logs, branches, etc. Plastic or other inorganic replicas or photographs should be used instead. (Exception: manufactured construction materials used in building the project or display)

- Soil, sand, rock, minerals, or waste samples, even if fully encased in acrylic

- All chemicals, including water

- All liquids, gels, powders, and creams, such as shampoo, sunscreen, salt, soap, agar, etc.

- Dry ice or other sublimating solids

- Hazardous substances or devices, including poisons, drugs, firearms, weapons, martial arts weapons, ammunition, etc.

- Sharp items, including syringes, needles pipettes, nails, knives

- Flames or highly flammable materials

- Glass or glass objects unless deemed by the Display and Safety Committee to be an integral and necessary part of the project (e.g., glass tat is an integral part of a computer screen)

- Hammering, pinching, or pounding devices that are not fully immobilized, pulleys or hinges with pinch points, etc.

- Batteries with open-top cells

- Any apparatus or item deemed unsafe by ay member of the SRC, the Display and Safety Committee, judges, or the GSEF staff, (e.g., vacuum tubes or dangerous ray-generating devices, pressurized or empty tanks that previously contained combustibles, etc.

**PER DISPLAY REGULATIONS**

The following items **<u>CANNOT</u>** be displayed at a GSEF project:

- Acknowledgments, endorsements, thanks

- Awards, medals, flags, logos (including school and university logos)

- Give-away items such as flyers, pens, postcards, CDs, business cards, etc. You may give out unaltered copies of your Official Abstract Form.

- Contact information of any finalist or their school: email or postal address, social media address, QR code, telephone, business card, fax number, or contact URL (URLs used solely to cite the sources of photos are permitted)

- Active internet or email connections

- For Continuation projects, no prior years' written material or visual depictions on the display board. However, previous years' logbooks and binders may be on the table if desired and if clearly marked, e.g. "Year 1." The project title should mention which year the project is, e.g., "Year Two".

# Display & Safety Regulations continued...

**Always think, "safety first!" and keep these things in mind when conducting your experiment:**

1.  Make sure you have recruited a responsible adult to help you

2.  Never eat or drink during an experiment and always keep your work area clean

3.  Wear protective goggles when doing any experiment that could lead to eye injury

4.  Do not touch, taste, or inhale chemicals or chemical solutions

5.  Respect all life forms. Do not perform an experiment that will harm an animal.

6.  All experiments should be supervised by a responsible adult!

7.  Always wash your hands after conducting the experiment, especially if you have been handling chemicals or animals

8.  Dispose of waste properly

9.  Any project that involves drugs, firearms, or explosives are not permitted

10.  Any project that breaks district policy, and/or local, state, or federal laws are not permitted

11.  Use safety on the internet! Never write to anyone without an adult knowing about it. Be sure to let an adult know about what websites you will be visiting, or have them help you search.

12.  If there are dangerous aspects of your experiment, like using sharp tools or experimenting with electricity, then please have a responsible adult help you or have them do the dangerous parts--that's what adults are for, so use them correctly (besides, it makes them feel important!)

**Know before you go! Helpful hints about the Science Fair:**

1.  Adults can help, in fact we want them to get involved. They can help gather materials, supervise your experiment, and even help build the display. They just can't be with you during the judging.

2.  Experiments are recommended over collections and models. You will not score very high unless you do an experiment, so save the models and collections for a class project. A significant portion of the scoring is based on your use of the Scientific Method.

3.  You cannot bring the materials of your experiment for the display or perform the experiment live. You will only be judged on our presentation and display board. You can, however, mount things on your board in a type of 3D display, but remember that your board has to be able to stand by itself, so don't get carried away. If you do mount things on the board, try not to mount something expensive that you bought and make sure you have things mounted securely so they don't fall off. YOU MAY NOT MOUNT ANY FOOD OR ORGANIC MATERIALS!

# Display & Safety Regulations continued...

4. Displays must be on display boards or can be made with cardboard. They can be no longer than 100cm in height, 180cm in length, and 75 cm deep.  They must be able to stand alone.

5. Limit your presentation to 12 minutes at the most; give yourself about 5-7 minutes to speak and allot the rest of the time for the judges to ask questions.

6. No recording or transmitting devices are permitted (e.g., no tape recorders, walkie-talkies or two-way radios, cell phones, etc.)

7. Respect all adults and other participants involved in the fair!

8. All decisions of the judges and Science Fair Committee are final

# Helpful Websites

Still need more ideas for project topics or help on getting started? Check out these websites! *(Please Note: these sites are not being endorsed by the school or any organization connected to the Science Fair and have not been thoroughly vetted. We are not offering any guarantees related to use of these sites, they are merely being provided as suggestions for resources available to you.)*

**Davidson Institute:**

A collection of resources dedicated to gifted students. The site includes links for local and national organizations that sponsor science fair competitions, access to printed materials, and links for informational websites and learning tools.

http://www.davidsongifted.org/Search-Database/topic/105296/entryType/2

**Teachers Try Science:**

This site has a section specifically tailored for kids and contains various experiments related to the STEM categories: Earth Sciences, Social Sciences, Medicine & Health, Chemistry, Biological Sciences, Space Sciences, Physical Sciences, Mathematics, and Technology & Engineering.

https://www.teacherstryscience.org/kids

**Science Fair Central:**

*"The Home Depot and Discovery Education have joined forces to help STEAM-power classrooms and homes across the country as students prepare for the careers of tomorrow. With 10 million students from grades K-12 participating in science fairs and STEAM events every year, Science Fair Central aims to give students the tools to take their projects to the next level."*

https://www.sciencefaircentral.com/

**Science Fair Idea Exchange:**

This site includes various project ideas and instructions for experiments for different skill/difficulty levels.

http://amasci.com/sc/scifair.html

**Science Buddies:**

A guide that walks students through the process of the project process, from getting started with project ideas to communicating their final results at the fair.

https://www.sciencebuddies.org/science-fair-projects/science-fair

**Science Fair Primer:**

A site to help students get started and proceed through the science fair process step by step.

http://users.rcn.com/tedrowan/primer.html

# Types of Science Projects

There are two basic types of science projects: models and experiments. There are notable differences between the two.
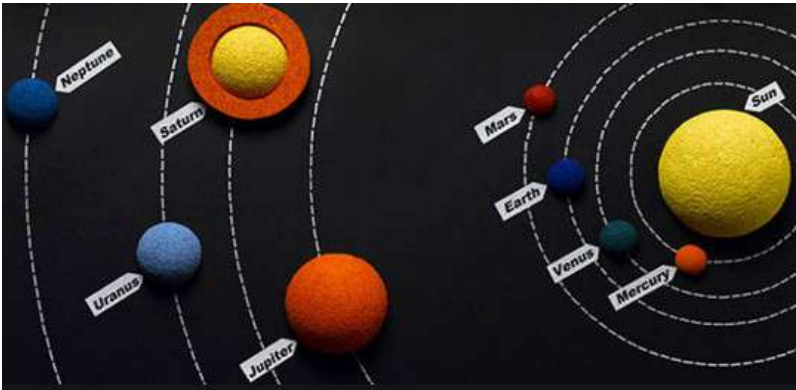


**A Model, display, or collection:**

Shows how something works in the real world, but does not really test anything. For example, a display or collection project could be "The Solar System", "Types of Rocks", or "How an Electric Motor Works".

# VS.

**An Experiment:**

Gives a lot of information and also has a project that shows testing being done and the gathering of data.

Examples of experiments might be "The Effects of Detergent on the Growth of Plants" or "Which Paper Towel is More Absorbent?"
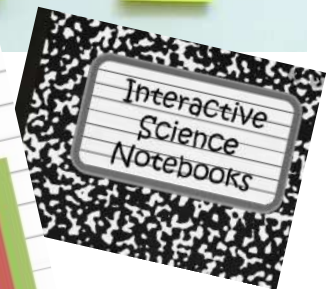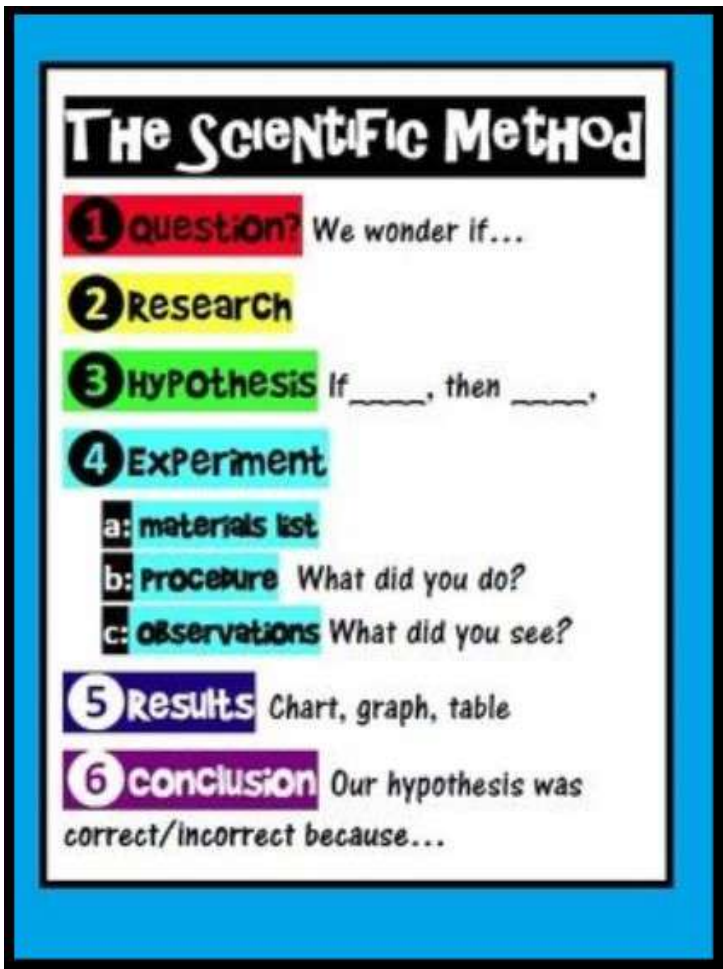


So what type of project should you do? Even though you can learn a lot from building a model or display, **we recommend that you do an experiment**!

Experiments are more engaging, and they take you through the **scientific method**, which is the way *real* scientists investigate the wonders of the world around us. The scientific method is what the judges are looking for!
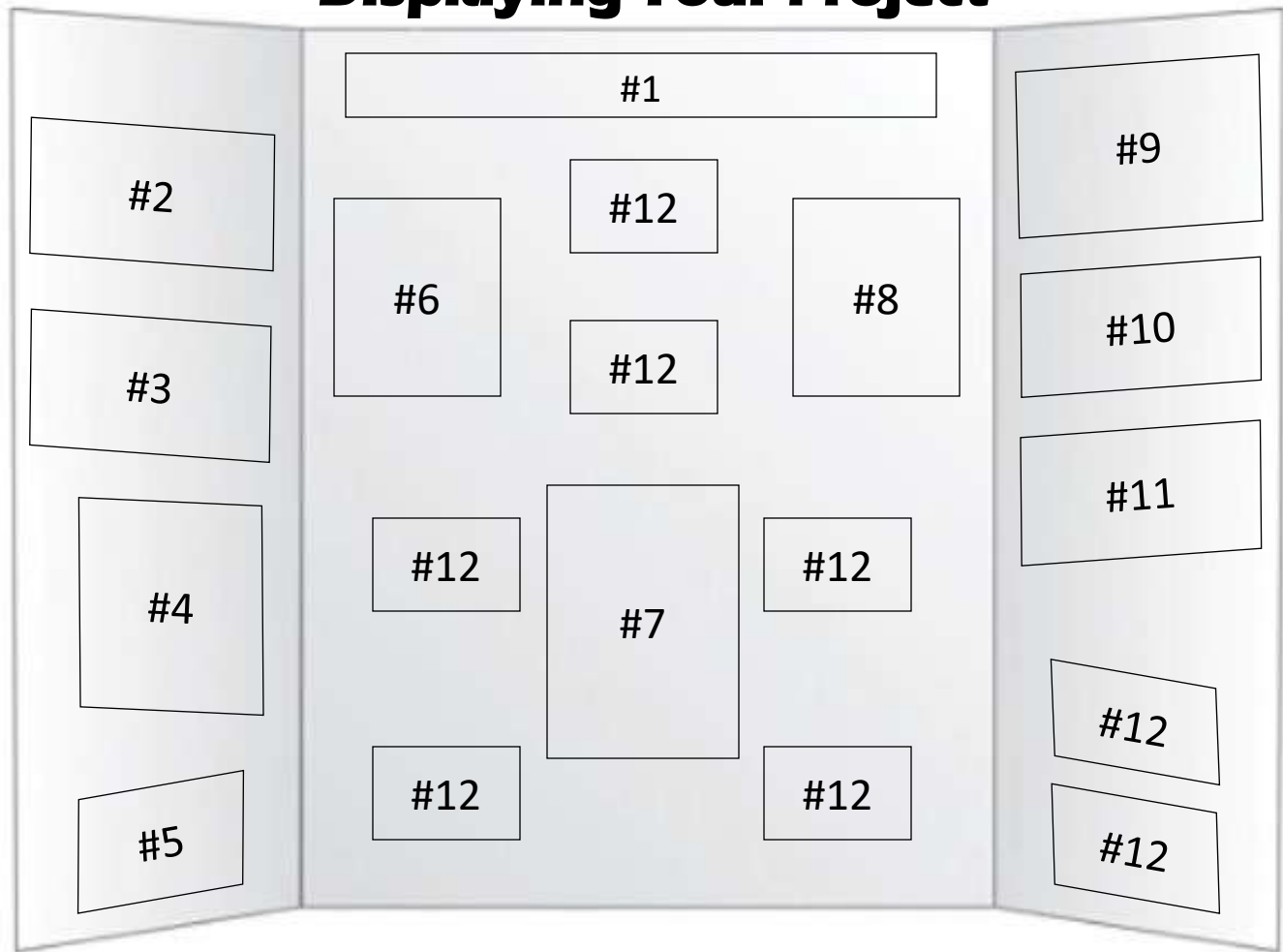
# The Scientific Method

## (K - 2nd)

The Scientific Method

1. **Question?** We wonder if...
2. **Research**
3. **Hypothesis** If_____, then _____.
4. **Experiment**
   - a: materials list
   - b: Procedure What did you do?
   - c: Observations What did you see?
5. **Results** Chart, graph, table
6. **Conclusion** Our hypothesis was correct/incorrect because...

## (3rd - 5th)

Observe a Phenomenon
↓
Ask a Question About the Observation
↓
Create a Hypothesis
↓
Make a Prediction
↓
Test Your Hypothesis with an Experiment
↓
Analyze Your Data
↓
Draw a Conclusion
↓
Results Support your Hypothesis / Results Do Not Support your Hypothesis
↓
Make a New Hypothesis or Prediction
↓
Share Results

# Displaying Your Project

|  |
|---|
| #1 |

#2

#9

#6

#12

#8

#12

#3

#10

#4

#12

#7

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#5

#12

#12

#12

#12

1. Title: name of project

2. Purpose: reason for the project; your question; what you want find out

3. Hypothesis: a prediction that you make of the results before conducting the experiment

4. Report: documentation of your research & information on the subject

5. Resources: a list of the books you read, websites used, and/or interviews conducted

6. Materials: a list of supplies needed for the experiment

7. Procedure: the steps or directions that you used to conduct the experiment

8. Variables: the things that are changing in the experiment; any factor, trait, or condition that can exist in differing amounts or types

9. Results: graphs or charts *showing* what happened as a result of the experiment

10. Conclusion: *describing* what happened as a result of the experiment; Did it work? Was your hypothesis correct or incorrect? What did you learn?

11. Application: explain how your experiment relates to the real world

12. Pictures: visuals, visuals, and more visuals documenting your scientific journey

*You may choose to adjust the layout, but make sure to include all required elements*

# Displaying Your Project continued...

- You can purchase a display board or make your own out of cardboard

- The display board dimensions are:

    Height: 100 cm

    Length: 180 cm

    Depth: 75 cm

- Your display board **must** be able to stand on its own


**Secrets to Creating a Visually-Appealing Display:**

- Typing your information is best, but if you can't, then write it in your best handwriting

- If typing your information, make sure the fonts are readable, and only use one or two type faces

- Spray adhesive is less messy than liquid glue

- Mount white paper, pictures, graphs, and tables on colored paper; make sure the colored paper is larger so that it creates a border for the white paper

# Judging and Scoring

**If in-person schooling has resumed by January 11, 2021:**

Projects should be brought to the school by **Monday, January 11, 2021**.

No Science projects will be accepted after **Tuesday, January 12, 2021.**

**If in-person schooling has <u>NOT</u> resumed and we are still in remote learning by January 11, 2021:**

If we are still in remote learning by this date, then students have two options to submit their project.

**Option 1** for project submission <u>while in remote learning</u>:

- Bring the project to the school to drop off. Designated staff will be waiting in the car rider lane to accept projects on **Monday, January 11, 2021 from 4p - 6p <u>only</u>**. Please be sure to bag any loose materials and make sure project board and bagged materials are clearly labeled with student's name, grade, and teacher. Also include a picture of **<u>exactly</u>** how your project should be set up; please do not rely on the teacher to automatically know--they will not be responsible for scores impacted by improper setup!

# OR

**Option 2** for project submission <u>while in remote learning</u>:

- Record a video presentation of the project using Flipgrid. **A code will be provided to students closer to submission date--only use the code provided and be sure to adhere to the posted deadline of Monday, January 11, 2021** . Submissions should be 8 minutes or less; students should clearly and thoroughly explain the purpose of their investigation, give a brief summary of their background research, identify their hypothesis, explain the procedure they used to complete the experiment or investigation, and give a brief summary of the results and conclusion. Be sure that the judges are able to see the project board and either a brief demonstration of the experiment/investigation or clear photographs of such.

    *Remember: be brief, but thorough--the judges will not be able to ask questions for clarification about your project at this time as they will only be viewing your recording.*