

Hawthorn Science Fair Participant's Project Packet 2022-2023



The science fair is open to all Hawthorn students. Students may do individual or partner projects. In order for your project to be entered as a judged project and be eligible for the Regional Science Fair, you need to follow the guidelines in this packet. If you have any questions, please contact Michelle Salzman at msalzman@fz.k12.mo.us

DATES TO REMEMBER

- Hawthorn Science Fair Projects Due: **1/20/23**
- Last chance to enter science fair: **1/23/23**
- Science Night/Science Fair Awards: **2/23/23**
All projects will be on display throughout the school. Winners will be announced and awarded. Hands on experiments will be available for the students to try.
- Project Pickup/taken home: **2/23/23** after Science Night or **2/24/23** projects will be taken home.
- St. Charles Regional Science Fair: **April 1, 2023** at North Point High School at 2255 W Meyer Rd, Wentzville, MO 63385.

Helping Your Child Get Started

“How can I help my child with a science fair project?” This is a question that we as teachers often hear. It is important to know that the more you are involved with your child’s education the more your child will learn. As a parent you can be a Mentor (good listener and questioner) or a Coach (someone who teaches skills) during their Science Fair project.

As a parent:

1. Encourage your child’s natural curiosity and sense of wonder by sharing in their observations.
2. Be a good Listener. What are your child’s interests? Help them focus their question and find one that is meaningful to them.
3. Be Positive. If you have a positive attitude towards this project it will help your child to develop the same positive attitude.
4. Look for ideas. Check out the library, the internet, the Zoo, parks, Science Center, etc. to get your child’s creative juices flowing!
5. Help your child with their observations and log.
6. Proofread your child’s report. Check for convention errors, as these can be distracting to the judges and take away from the overall greatness of the project.
7. Suggest ways to make your child’s project more presentable on their display board.
8. Remember it is THEIR project!

“I don’t know what project to do!”

If your child is struggling to choose a topic for their science experiment try:

1. Going on the internet for a quick search of Science Fair Experiments.
2. Check out your local library!
3. Check out some of the ideas included in this packet.

Science Fair Project	NOT a Science Fair Project
• A problem that needs an answer. Ex: “What color clothing absorbs the most heat? • A relevant, scientific question. Ex: Does the appearance of food affect its taste? • A question that generates further questions to answer. Ex: Does the mass of an object affect the buoyancy of the object? Which leads to: Does the volume affect the buoyancy? Which leads to: What is the relationship between mass and volume?	• A Model Ex: An erupting volcano model. • A Collection Ex: Rocks, coins, or leaves • Observation Ex: Watching dog behavior or Watching weather change. • A Test on a Human or Animal. Ex: Which treat flavor do dogs prefer?

Science Fair Project Ideas

1. Which brand of popcorn leaves the fewest unpopped kernels?
2. Which brand of chocolate melts fastest in the sun?
3. Which can support more weight, paper or plastic grocery bags?
4. Which brand of stain remover works the best?
5. How does the shape of an object affect the time it takes to fall to the ground?
6. Which paper towel brand is the strongest?
7. What method of popping (microwave, stove, oven, etc..) pops the most popcorn?
8. Does salt affect the freezing and boiling point of water?
9. Which brand of bread molds quickest? (need to complete additional paperwork-see later in packet)
10. How does gravity affect the bouncing of different sizes or weights of balls?
11. Which brand of paper plates will hold the most weight?
12. Does exposure to sunlight affect the size of an inflated balloon?
13. What lightens stains better vinegar or lemon juice?
14. Does bread stay fresher longer when it is kept in the refrigerator or on the counter? (need to complete additional paperwork-see later in packet)
15. How well does water dissolve salt or sugar compared to other liquids (like oil, corn syrup, or vinegar)?
16. Does salt water freeze?
17. Does sunlight fade paper more in books or magazines?
18. Do objects float better in freshwater or saltwater?
19. Can blindfolded people tell the difference between tap water and bottled water?
20. What material conducts sound the best- metal, water, wool?

Projects are Judged by Category

Your child will be expected to state which category that the project should be judged under. There will be a first, second, and third place winner for each of the categories. Only the first place winners will move onto the Regional Science Fair. The categories are:

Biological -may contain anything having to do with the functions, behaviors and structures of living things or human health. Projects that include human subjects, animals, plants, bacteria, fungus, nature studies, etc. would be considered Biology projects . Biology is the study of living things and how they grow. This includes plants, animals, bacteria, and fungi. Projects focused on bacteria or plants are best as there can be ethical concerns and restrictions on using animals for science fair projects. Project ideas can include experiments which look at how a factor such as light, temperature, water, soil acidity, or fertilizer affects plant growth.

Earth-projects that have to do with the earth, astronomy, meteorology and geology. Earth science encompasses things such weather, climate, volcanoes, fossils, rocks, and the ocean. A project focus might include an analysis of where certain types of weather occur and what the common factors produce that weather phenomenon. A child could also explore different types of rocks and minerals and where they may be found.

Physical - Physicists study matter and energy. This may sound complicated until you know that this includes light, sound, magnetism, and motion. Projects that reflect principles of physics such as friction, pulleys, gravity, etc. The analysis of existing conditions of the environment. Subcategories include: Air Pollution and Air Quality, Soil Contamination and Soil Quality, Water Pollution and Water Quality. For example, the study of contamination of the air by such things as noxious gases, elements, minerals, chemicals, solid and liquid matter (particulates), etc. Projects that reflect chemical principles such as density, boiling point, freezing point, acid/base relationships, etc. would be considered Chemistry projects.

Applied Consumer Science - Projects that compare or test the effectiveness of household projects or projects that are new inventions.

Regional Science Fair Guidelines

* Although there are a lot of great “ideas” for a science fair project, not all of them follow the guidelines for the actual science fair. When you search for “science fair projects” in books or on websites, be careful that they follow the guidelines listed below. If you are not sure, ask your teacher!

Rules of Participation and General Information for K-8 and Non-Honors division 9-12 Projects

1. Any student in grades K-8 who has won at their local level is invited to have their project judged at the Missouri Tri-County Regional Science and Engineering Fair (MTRSEF) in one of four categories:
Biology, Physical Science, Earth/Environmental or Applied Consumer Science
2. Students will be judged on creativity and scientific thought (see suggested judging sheet in Appendix).
3. Students in grades K-8 are NOT allowed to do any projects involving non-human vertebrate animals (i.e. dogs, cats, fish, hamsters, etc.).
4. Projects involving bacteria/fungi MUST fill out this form:
(<https://drive.google.com/file/d/10XzfnApTaln8DPrxa1CV7418FagmtrbR/view?usp=sharing>). This form must be uploaded when the project is registered for competition at the regional fair. Projects without the required paperwork completed will be allowed to be displayed, but will NOT be judged.
5. Students in grades K-8 are NOT allowed to do any projects involving hazardous chemicals or devices, including, but not limited to:
 - a. explosives (including fireworks)
 - b. guns
 - c. prescription medications
 - d. alcohol
 - e. tobacco products
 - f. toxic chemicals
6. Certain projects involving humans are not permitted. These include, but are not limited to, projects involving
 - a. pain or risk of injury
 - b. having participants take medications
 - c. surveys involving drug use or sexual behaviors

7. Projects involving humans MUST fill out this form:
(https://drive.google.com/file/d/1Ugl-u9J76paHgtAXJLJMIJl6zR_LyjYy/view?usp=sharing). This form must be uploaded when the project is registered for competition at the regional fair. Projects without the required paperwork completed will be allowed to be displayed, but will NOT be judged.
8. Display boards should be of a typical 36" x 48" inch tri-fold board that can stand on its own. A title header board is acceptable but not required.
9. Absolutely NO materials or devices should be displayed with the board other than the log book.
10. Official judging sheets will NOT be made available to the public.
11. Students in grades K-5 will receive feedback sheets that are intended to give constructive suggestions for students to continue forward in their scientific endeavors.
12. Awards will be given for 1st, 2nd and 3rd place in each category for each grade level.
13. All projects must be removed from the venue after judging. Any projects remaining after completion of the fair will be disposed of.
14. Team projects are permitted, but may consist of only two students.
15. Class projects for grades K-2 are permitted.

Students in grades K-8 are prohibited from performing research involving vertebrates, including humans. This includes:

- *Explosives/guns
- *Prescription Medications
- *Alcohol/tobacco products
- *Toxic Chemicals
- *Pets (including aquarium fish)

Additional Prohibitions

YOU MAY DISPLAY PICTURES OF YOUR PROJECT, BUT.....

- *No faces or animals allowed in the report, in pictures, or on the display.
- * No animal or human food items may be displayed no matter how well packages.
- *No taxidermy specimens or parts.
- *No preserved vertebrate or invertebrate animals.
- *Do not display chemicals or liquids, including water.
- *No human/animal parts or body fluids.
- * Do not display any bacterial cultures or fungi (molds).
- *Do not display any live or preserved plants or animals including insects.
- *Do not display soil or waste samples.
- * Do not display sharp items.
- * Do not display dry ice or other fog producing material.
- *Do not display flames or highly flammable material.
- * Do not display glass or glass objects.
- *Do not display weapons or lasers.
- * Do not display poison, drugs, or other controlled substances.
- * Do not display your school name or identification.
- *Do not display awards from other competitions.

The Science Fair Board

The board must have the following dimensions to be considered for the Regional Science Fair

36in x 48in trifold

****Boards can be ordered from Amazon, Walmart, Office Depot**

****For fifth graders who are completing a science project for a grade but do not want to participate in the science fair, a poster board is acceptable for the project.**

General Information for Science Fair Projects

*All projects follow the same general steps. This information is presented on the display board, in a log book, and in a report.

Partner Projects: consist of a maximum of two people. Partner projects that have two students from different grades will be placed in the higher grade of the partnership.

I. Question/Problem and Purpose

- A. Select a topic that interests you!
- B. Choose Something you can:
 - 1. Investigate yourself.
 - 2. Measure (length, time, weight, growth, speed, etc.)
 - 3. Construction, model, or build
- C. State your topic as a question that you can answer by experimentation. Then state your reason for completing the experiment.

Ex: Topic: Airplanes

Question: Will the length of a paper airplane's wingspan affect the time it will stay in flight?

Purpose: This experiment helped me determine what size paper to use for creating the most successful paper airplane.

II. Research and Background Information

- A. Find as much background information on the topic as possible. You may use:
 - 1. The internet
 - 2. Books, Magazines, Text Books

3. Encyclopedia

* Don't forget to keep a reference list of your sources that you used.

B. Keep a notebook about what you learn from your experiment. Include:

1. The procedures that you followed in your experiment.
2. Dates and times of observations.
3. Observation Notes
4. Materials that you used.
5. Ways to improve your experiment.

III. Hypothesis

A. A hypothesis is an educated guess that will answer your experimental question. (the problem you are trying to solve).

1. The hypothesis should be stated and written BEFORE you go any further.
2. They hypothesis is where you decide what you THINK will happen when you do your experiment.
3. The hypothesis should be written with the words "If.... then....."
4. Include your Independent and Dependent Variable in your hypothesis.
 - a. **Independent Variable:** The ONE thing that you change during your experiment.
 - b. **Dependent Variable:** The EFFECT that the independent variable has on your experiment.

Ex: **Hypothesis:** If the length of a paper airplane's wingspan is increased, **then** the time of flight will increase

Independent Variable: The length of the wingspan

Dependent Variable: The time the plane remains in the flight.

IV. Gather and List Materials

- A. Develop a specific list of materials needed to do the experiment.
- B. List exact quantities, measurements and amounts.
- C. Use metric measurements

V. Procedures

- A. Write out a **step by step** set of directions that you will use to do your experiment (number each step).
- B. Make sure your procedure is easy to follow.
- C. Perform your experiment
- D. Keep a record of all of your data in your LOG BOOK.
- E. Perform your experiment a minimum of 3 times.
- F. Try to photographs during your experiment. (Remember, NO faces)

VI. Results

- A. What happened in the experiment?
- B. Organize all of your data.
- C. Draw charts, tables, and graphs to show your results.
- D. Write a detailed summary of your observations and results.

VII. Conclusion

- A. Explain your results.
- B. Compare your results with your hypothesis.
- C. State whether your hypothesis was supported or not supported.
- D. Write down what you learned from the experiment.
- E. Include a Future Study. (What would you do differently if you were to do this experiment again?)

Project Display

- A. Give your project a TITLE.
- B. Be neat and use correct spelling.
- C. Display pictures (if you have them) on your display board, your LOG BOOK, or a small photo album.
- D. Include the following on your display board so that it is visible to the judges:
 - 1. Title
 - 2. Question
 - 3. Background Information
 - 4. Hypothesis/Variables
 - 5. Materials List
 - 6. Procedures
 - 7. Results (Data, Graph, Charts, etc.)
 - 8. Conclusion
 - 9. Written Report in a LOG BOOK
 - 10. Pictures
 - 11. Bibliography

Science Fair Project (Log Book)

Title of Project: _____

Category of Science (Circle one): Applied Consumer Science Biology

Physical Science Earth Science

Question/Problem: _____

*The problem is a question that you can do a test or experiment to answer.

Hypothesis:

If: _____

then: _____

*The hypothesis is what you think will happen when you test your problem.

Independent Variable: _____

*The thing that you will change or test

Dependent Variable: _____

*The change that actually happens

Control Test: _____

*A test or trial that doesn't have the independent variable

Constants: _____

*The things that stay the same every time

Materials:

- _____
- _____
- _____
- _____
- _____
- _____
- _____

Procedure:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Trial 1: Results	Trial 2: Results	Trial 3: Results

Results: _____

*This is a good place to use pictures, charts, and graphs.

Conclusion:

*What did you learn? My hypothesis was correct or incorrect, then state why,