

2024 4-H Roundup Science Fair Guidelines

The 4-H Roundup Science Fair provides youth the opportunity to showcase their 4-H project work through the application of scientific research, engineering, technology and/or experimentation. Participants will **1) construct a poster, 2) deliver a short oral presentation, and 3) respond to judges' interview questions**. Projects should follow either the Scientific Method or Engineering Design Process and the poster formatted accordingly.

Posters will be set up for public viewing, followed by judges' interviews and scoring.

ELIGIBILITY

The 4-H Roundup Science Fair is open to Senior Division 4-H members only. Science projects may be an individual effort or conducted by a team of two 4-H members.

ENTRY PROCEDURE AND DEADLINE

To enter, complete the **Entry Form** located on page 7 and upload the form when you register on 4-HOnline.

PROJECTS

Participants may enter science projects focused on any of the Big Five 4-H Project areas:

1. Agriculture & Livestock
2. Family & Community Health
3. Leadership & Citizenship
4. Natural Resources
5. STEM (Science, Technology, Engineering and Mathematics)

Participants may enter previous projects from other events such as major livestock shows, science fairs, school events, etc., provided they conform to the guidelines of the 4-H Roundup Science Fair.

JUDGING CRITERIA

The contest requires a **research poster, oral presentation and interview**. No written report is required. All entries will be judged as a group with top three finalists announced during Roundup assembly to receive final placement and awards. The judges' rubric is provided on page 5.

The members of Texas A&M AgriLife will provide equal opportunities in programs and activities, education, and employment to all persons regardless of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation or gender identity and will strive to achieve full and equal employment opportunity throughout Texas A&M AgriLife.

POSTER GUIDELINES

Projects should follow either the Scientific Method or Engineering Design Process and the poster formatted accordingly.

Posters should include the following sections: **Descriptive title, list of authors, abstract, problem statement or question, hypothesis or prediction, experimental design, procedure, results, discussion, conclusions, and references.**

What is the Scientific Method?

The scientific method is a process for experimentation that is used to explore observations and answer questions. Scientists use the scientific method to explore relationships in nature.

Steps of the Scientific Method

1. Ask a question
2. Investigate previous research on the topic
3. Construct a hypothesis
4. Test hypothesis by performing an experiment
5. Analyze data and formulate results
6. Interpret results and draw a conclusion
7. Communicate results

What is the Engineering Design Process?

The engineering design process is a series of steps that engineers follow to find a solution to a problem.

Steps of the Engineering Design Process

1. Define the problem
2. Do background research
3. Specify requirements
4. Brainstorm solutions
5. Choose the best solution
6. Develop the solution
7. Build a prototype
8. Test and re-design
9. Communicate results

Posters should be no larger than 48 inches wide by 30 inches deep (the distance from front to back) 108 inches high (from floor to top, includes table if project is on tabletop). Note that tables are generally 24 inches wide but can vary with convention location. Items that do not adhere to the poster must fit on the tabletop within the dimension of the unfolded poster. Avoid lights, banners, shelves, etc. that are outside of the poster dimensions.

Following are suggestions for your poster:

- Your title is an attention getter. A good title should simply and accurately introduce your project and its nature. Limit the title to 10 words or less.
- Use quality visuals. Include photographs, drawings, charts and/or graphics as appropriate to effectively communicate your project. All visuals should be clear and easy to interpret. Include headings and labels on graphs, charts, diagrams and tables.
- Your poster should be logically organized and easy to follow.
- Font size should be large enough to read from 3 feet away. The poster should include the information the judges need without being crowded.

PRESENTATION AND INTERVIEWS

Contestants will give a 7 to 10-minute presentation and have a short interview with judges. If contestants enter as a team, both team members must have an equal speaking role during the presentation.

Following are suggestions for presenting your poster:

- Be sure to state the title and purpose of your project. Provide a brief explanation of why you selected the topic and why it is important to you.
- Speak in a loud and clear voice.
- Use vocabulary which demonstrates knowledge of the subject matter.
- Stay relaxed and use good posture. Avoid fidgeting and maintain eye contact with judges.
- Practice your presentation and anticipate the types of questions a judge may ask.

PROJECT AND POSTER EXHIBIT SAFETY

Safety should be a primary concern for every science experiment. Almost any tool or technique, no matter how safe, can be used in an unsafe manner. At the same time, many potentially dangerous tools are perfectly safe if they are used in the proper way. All projects involving humans as subjects must involve minimal risk. Unacceptable risks include ingestion of any substance or physical contact with any potentially hazardous materials, as well as unnecessary physical, psychological, or emotional stress, including invasion of privacy. Even if you are simply surveying other students, you should review your questions in advance and decide if the questions meet this test and determine if a

parent/guardian's consent is needed for any students that are participating. If you are not sure, do not hesitate to ask your County Extension Agent, parent, or mentor to help you decide.

Exhibit

1. If an exhibit becomes unsafe or unsuitable for display, it will be removed and deemed ineligible for any awards.
2. Projects which involve vertebrate animal subjects must conform to the following statement: **Experiments on live animals involving surgery, the removal of parts, injection of harmful chemicals, and/or exposure to harmful environments, are not acceptable.** Live vertebrates are not permitted.
3. Toxic and hazardous chemicals are prohibited.
4. All necessary chemical glassware must be displayed in a stable manner. The items must be back from the edge of the table and may not be operational at any time.
5. 4-H Member should substitute colored water, photographs or drawings for chemicals.
6. Crystals, other than sucrose (sugar) and sodium chloride (salt), may not be displayed. Projects involving crystals can be represented by pictures or other three-dimensional models.
7. Hypodermic needles and syringes may not be displayed in any exhibit.
8. It is critically important that no person be exposed to any bacteria that are considered pathogenic. Therefore, the following two rules are very important: **No wild cultures incubated above room temperature; no cultures taken from humans or other warm-blooded animals may be used.** This includes, but is not limited to skin, throat and mouth.
9. Plastic petri dishes must be sealed.
10. Lasers may not be used in any exhibit.
11. Dangerous and combustible materials are prohibited.
12. No exhibit shall have open flames. Any part of an exhibit that can get hotter than 100 degrees Celsius (boiling water temperature) must be adequately protected from its surroundings.
13. If an exhibit includes electrical wiring or devices, they must be safe. For voltages above 20 volts, special precautions must be taken. All connections must be secure and provide suitable protection against short circuits, etc.
14. All wiring carrying more than 20 volts must be well insulated. Also, the connections must either be soldered or secured by UL approved fasteners. The wire used must be insulated adequately for the maximum voltage that will be present and the wire must be of sufficient size to carry the maximum current you anticipate. Open knife switches or doorbell-type push buttons in circuits using more than 20 volts may not be used.
15. If the exhibit will be connected to 120-volt AC power (plugged into a wall outlet) fuses or circuit breakers must be provided to protect not only the exhibit but also any others that may share the same sources of power. The power cord used must be UL approved for the voltage and current it will be carrying, and it must be at least 1.8 meters (6 feet) long. Science fair staff must be notified of the need for power at the time of certification so power can be ordered in advance.
16. Exhibits requiring voltage in excess of 120 volts AC are not allowed.

Texas 4-H Roundup Science Fair – Judge’s Rubric

4-Her’s Name(s):
County/District:
Project Title:

Part I: Research Question/Problem		
	Possible Points	Points Earned
<ul style="list-style-type: none"> • Clear and focused purpose • Description of practical need or problem to be solved • Identifies contribution to the field of study • Explanation of constraints • Testable using scientific or engineering design methods <p>Comments:</p>	10	
Part II: Design and Methodology		
	Possible Points	Points Earned
<ul style="list-style-type: none"> • Well-designed plan and data collection methods • Exploration of alternatives to answer need or problem • Variables and controls defined, appropriate and complete • Identification of a solution (<i>engineering design</i>) • Development of a prototype/model (<i>engineering design</i>) <p>Comments:</p>	15	
Part III: Execution: Data Collection, Analysis and Interpretation Construction and Testing (engineering design)		
	Possible Points	Points Earned
<ul style="list-style-type: none"> • Systematic data collection and analysis • Reproducibility of results • Appropriate application of mathematical and statistical methods • Sufficient data collected to support Interpretation and conclusions • Prototype demonstrates intended design (<i>engineering design</i>) • Prototype has been tested in multiple conditions/trials (<i>engineering design</i>) • Prototype demonstrates engineering skill and completeness (<i>engineering design</i>) <p>Comments:</p>	20	

Part IV. Creativity		
	Possible Points	Points Earned
<ul style="list-style-type: none"> Project demonstrates significant creativity in one or more of the above criteria <p>Comments:</p>	20	
Part V. Poster Presentation		
	Possible Points	Points Earned
<ul style="list-style-type: none"> Logical organization of materials Clarity of graphics and legends Citations and references displayed <p>Comments:</p>	15	
Part VI. Interview		
	Possible Points	Points Earned
<ul style="list-style-type: none"> Clear, concise, thoughtful responses to questions Understanding of basic science relevant to project Understanding interpretation and limitation of results and conclusions Degree of independence in conducting project Recognition of potential impact in science, society and/or economics Quality of ideas for further research For team projects, contributions to and understanding of project by all members <p>Comments:</p>	20	
TOTAL SCORE:		

Additional Comments

Texas 4-H Roundup Science Fair Entry Form

Scan and upload this form when you register at 4-HOnline.

Contest Name and Location:

4-H Member(s) Name:	
Project Title:	
County:	
District:	CEA Name:
4-H Club Name:	

Project Abstract: Write neatly below or attach a typed copy with your name and problem on it. Be sure to include your research hypothesis or problem statement and objective(s).

4-H Member(s) Signature(s):	County Extension Agent Signature:
Date:	Date:
Parent/Guardian Signature:	Date Entry Received:
Date:	