National FFA Agriscience Fair

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National FFA Agriscience Fair

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National FFA Agriscience Fair

The National FFA Agriscience Fair is an exciting opportunity for students interested in scientific principles and emerging technologies in the agricultural industry. The National FFA Agriscience Fair provides middle and high school students the opportunity to achieve local, state and national recognition for their accomplishments in agriscience. This program also gives students a chance to demonstrate and display agriscience projects that are extensions of their agriscience courses.

Preface

This handbook is useful to:

1. Assist teachers and students in developing strong supervised agriculture experience (SAE) programs with research components.
2. Supplement individual instruction provided by agriscience instructors/FFA advisors.
3. Provide helpful suggestions, advice and guidance on how to complete the application and compete in the National FFA Agriscience Fair.

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Agriscience Awards Committee Members:

Dr. Brian E. Myers, *University of Florida, Florida*
Dr. Mark Balschweid, *University of Nebraska, Nebraska*
Mr. Jose Bernal, *Amphitheater High School, Arizona*
Ms. Gwynne Millar, *Exeter-West Greenwich High School, Rhode Island*
Dr. Wendy Warner, *North Carolina State University, North Carolina*

Technical Writer:

Mrs. Jessica Scholer, *Indianapolis, Indiana*

About FFA

FFA is a national organization of 523,309 student members preparing for leadership and careers in the science, business and technology of agriculture. Local, state and national programs provide opportunities for students to apply knowledge and skills learned in the classroom. The organization has 7,487 local chapters in all 50 states, Puerto Rico and the Virgin Islands. The National FFA Organization website, www.ffa.org, has more information about the organization. The National FFA Organization is dedicated to making a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education.

Chapter 1: Introduction

The National FFA Agriscience Fair recognizes students studying the application of scientific principles and emerging technologies in agricultural enterprises. The National FFA Agriscience Fair is for middle and high school students. Participation begins at the local chapter level and progresses to state and national levels. Areas of participation closely mirror the National Agriculture, Food and Natural Resources Career Cluster Content Standards. This section will give you the basic information regarding the National FFA Agriscience Fair such as categories and rules.

When selecting a topic for your agriscience fair project, consider your ongoing SAE program as a good place in which to begin. Quality experimental SAE projects/activities are well suited for all students and can be easily incorporated into any SAE program. Experimental SAE activities can provide valuable learning experiences for students with agriscience-related career goals (as well as those with other career interests).

Developing a quality agriscience project includes or requires:

- Focusing on an important agricultural/scientific issue, question or principle.
- Specific research objectives.
- Using a number of steps.
- Following a scientific process to collect and analyze data.
- Student commitment to a moderate or substantial amount of time.
- Teacher supervision.

Category Description and Examples

Animal Systems (AS)

The study of animal systems, including life processes, health, nutrition, genetics, management and processing, through the study of small animals, aquaculture, livestock, dairy, horses and/or poultry.

Examples:

- Compare nutrient levels on animal growth
- Research new disease control mechanisms
- Effects of estrous synchronization on ovulation
- Compare effects of thawing temperatures on livestock semen
- Effects of growth hormone on meat/milk production

Environmental Services/Natural Resource Systems (ENR)

The study of systems, instruments and technology used in waste management; the study of the management of soil, water, wildlife, forests and air as natural resources and their influence on the environment.

Examples:

- Effect of agricultural chemicals on water quality
- Effects of cropping practices on wildlife populations
- Compare water movements through different soil types

Food Products and Processing Systems (FPP)

The study of product development, quality assurance, food safety, production, sales and service, regulation and compliance and food service within the food science industry.

Examples:

- Effects of packaging techniques on food spoilage rates
- Resistance of organic fruits to common diseases
- Determining chemical energy stored in foods
- Control of molds on bakery products

Plant Systems (PS)

The study of plant life cycles, classifications, functions, structures, reproduction, media and nutrients, as well as growth and cultural practices, through the study of crops, turf grass, trees and shrubs and/or ornamental plants.

Examples:

- Determine rates of transpiration in plants
- Effects of heavy metals such as cadmium on edible plants
- Compare GMO and conventional seed/plant growth under various conditions
- Effects of lunar climate and soil condition on plant growth
- Compare plant growth of hydroponics and conventional methods

Power, Structural and Technical Systems (PST)

The study of agricultural equipment, power systems, alternative fuel sources and precision technology, as well as woodworking, metalworking, welding and project planning for agricultural structures.

Examples:

- Develop alternate energy source engines
- Create minimum energy use structures
- Compare properties of various alternative insulation products
- Investigation of light/wind/water energy sources

Social Systems (SS)

The study of human behavior and the interaction of individuals in and to society, including agricultural education, agribusiness economic, agricultural communication, agricultural leadership and other social science applications in agriculture, food and natural resources.

Examples:

- Investigate perceptions of community members towards alternative agricultural practices
- Determine the impact of local/state/national safety programs upon accident rates in agricultural/natural resource occupations
- Comparison of profitability of various agricultural/natural resource practices
- Investigate the impact of significant historical figures on a local community
- Determine the economical effects of local/state/national legislation impacting agricultural/natural resources

Rules

Plagiarism

An agriscience fair project must be the result of a student's own effort and ability. However, in securing information as direct quotes or phrases, specific dates, figures or other materials, that information must be marked in "quotes" in manuscripts and identified in the Literature Cited or Reference section of the written report. Non-compliance represents plagiarism and will automatically disqualify a participant (National FFA Board of Directors, October, 1960).

Students MAY NOT:

- In any way falsify a permission form, scientific paper or display.
- Use another person's results or thoughts as their own even with the permission of this person. This includes work done by a family member or a mentor.
- Use information or data obtained from the Internet without proper citation.
- Re-enter a project with only minor changes.

Ethics Statement

Scientific fraud and misconduct is not condoned at any level of research or competition. Plagiarism, use of presentation of other researcher's work as one's own and fabrication or falsification of data will not be tolerated. Fraudulent projects will result in elimination from the National FFA Agriscience Fair. Unethical behavior will result in notification to the student's local school administration.

Multiple Student Research Projects

If more than one agriscience project is entered from the same chapter and/or school, then projects must differ in:

- research hypotheses (questions or objectives).
- findings related to the research hypothesis (questions or objectives).
- conclusions.
- recommendations.

Each of the published authors must have made a unique and substantial contribution to the research endeavor. It is standard that peripheral contributions be acknowledged (i.e., The Researchers would like to thank Mrs. Smith's 7th Period Animal Science Class for their assistance in…). If there are any questions regarding the above policies and procedures, contact the National FFA Agriscience Awards program manager prior to beginning the research: agriscience@ffa.org or 317-802-4402.

Safety Rules

1. If an exhibit becomes unsafe or unsuitable for display, it will be removed and deemed ineligible for any awards.
2. Projects involving vertebrate animal subjects must conform with the following statement and have a fully completed non-human vertebrate endorsement form submitted: *Experiments on live animals involving surgery, the removal of parts, injection of harmful chemicals and/or exposure to harmful environments are not acceptable at the National FFA Agriscience Fair. Live vertebrates may not be exhibited at the fair.*
3. Hypodermic needles, syringes, crystals [other than sucrose (sugar) and sodium chloride (salt)] and/or toxic and hazardous chemicals are prohibited from display at the National FFA Agriscience Fair. Students should substitute colored water, photographs, three dimensional models or drawings for chemicals and crystals.
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. No wild cultures may be 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.
6. Only plastic Petri dishes may be used in displays, and they must be sealed.
7. Lasers may not be used in any exhibit.
8. Dangerous and combustible materials are prohibited.
9. No exhibit may 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.
10. 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.
11. All wiring carrying more than 20 volts must be well insulated. Also, the connections must either be soldered or secured by UL listed 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 door bell-type push buttons in circuits using more than 20 volts may not be used.
12. 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 listed for the voltage and current it will be carrying, and it must be at least 1.8 meters (6 feet) long. National FFA staff must be notified of the need for power at the time of certification so power can be ordered in advance.
13. Exhibits requiring voltage in excess of 120 volts AC are not allowed.

Eligibility

Membership

Each participant must be a current, bona fide, dues paying FFA member in good standing with the local chapter, state FFA association and National FFA Organization at the time of his/her selection and at the time of the event in which he/she participates.

In the event a participant's name is not on the chapter's official roster for the years in which the dues were payable to the National FFA Organization, a past due membership processing fee of $25, in addition to the dues, must be paid prior to certification. The participant, at the time of his/her selection as a national participant, must be:

- An FFA member. (A graduating senior is considered eligible to compete in state and national events up to and including his/her first national convention following graduation.)
- While in school, be enrolled in at least one agricultural education course during the school year and/or follow a planned course of study; either course must include a supervised agricultural experience program.
- Once a student places in the top three of a division and category, he/she can no longer compete in that division and category regardless of the research subject.
    - Students who wish to continue research on the same topic or who have won a division and category are encouraged to seek additional recognition using the proficiency award or star award, or they compete in another agriscience research area within the agriscience fair.

Divisions

The National FFA Constitution provides flexibility to meet the needs of students enrolled in non-traditional programs. For the purposes of participating in national FFA events, a student needs to be enrolled in at least one course during the year they qualify to participate. Competition is open to all FFA members in grades 7-12. There are four divisions:

- Division I – individual member in grades 7, 8 and 9.
- Division II – individual member in grades 10, 11 and 12.
- Division III - team of two members in grades 7, 8 and 9.
- Division IV - team of two members in grades 10, 11 and 12.

Grade is determined by the grade level of the member at the time of qualification at the state level. State associations with qualifying competitions may have up to 24 entries, one in each category, in each division. For example: An association may have an entry in Plant Systems in Division I, II, III and IV. State associations may not have more than one entry in a category/division.

Each member and/or team may enter only one project. Exhibited projects and project reports will be the result of the students' own efforts. A team is a maximum of two members working cooperatively on the same project. Teams can be made up of two students in different grades but will compete in the division in which the older participant would qualify. Team members must be from the same chapter at the time of qualification.

Interview Schedule Conflicts

Each participant is required to meet with the judges to explain their project. Participants/teams unable to meet with judges during the allotted time will be disqualified. No exceptions will be made due to participation in other events (i.e., National FFA Band or Chorus, career development events).

Members who have qualified to participate in more than one category of National FFA Award or Recognition Activities (e.g., CDEs, proficiency or stars finalist) must notify their state staff within five working days after being selected or certified to participate. State staff will contact appropriate program coordinator to determine if accommodations for dual participation can be arranged. Under no circumstances will the accommodation impact the published schedule, overall integrity of the event or other participants' ability to be fairly evaluated. In some cases, due to the published schedule, no accommodations will be made. In these cases the participant will need to choose, and where appropriate, the state staff may choose to certify a second place team or a replacement member. This policy does not supersede existing event policies that restrict multiple participation.

Process for Implementation

1. The local agriculture teacher notifies state staff of conflict.
2. State staff notifies appropriate National FFA program staff.
3. Program staff will contact event superintendents to discuss published event schedules and possible accommodations. National FFA staff will make final determination after obtaining input from event superintendents.
4. Program staff will communicate decision to state staff in writing with a copy of final decision sent to state staff, event superintendent and participant.

Add/Delete Policy

1. Should a state certified participant in an individual category and division become unable to attend national FFA convention, then the state may re-certify another individual in their place for that category and division by utilizing the official National FFA Add/Delete Form. States that have conducted a full agriscience fair should use the individual that placed second in that category and division at the state level. Should the second place individual not be available, a state may choose the next in line until an eligible participant from that division and category is found. The add/delete form must be signed by both the local instructor and state staff and must be in the National FFA Center at least ten (10) working days prior to the national FFA convention.
2. Should one member of a state certified agriscience fair team become unable to attend convention, the state may choose to replace one individual or the entire team. If only one individual is replaced, the new team member must be someone who has worked with the project. This certification should come from state staff by way of the official National FFA Add/Delete Form and must be signed by both the local instructor and state staff and must be in the National FFA Center at least ten (10) working days prior to the national FFA convention.
3. If another individual that has worked with the project is not available, or the entire team is unable to attend, then the state staff may certify the second place team or the next eligible team in that category and division at the state level by way of the official National FFA Add/Delete Form. Both the local instructor and state staff must sign and send this to the National FFA Center at least ten (10) working days prior to the national FFA convention.

4. All add/deletes for agriscience fair individual participants and teams must be received at the National FFA Center at least ten (10) working days prior to the national FFA convention. Any add/delete form received within ten (10) days of the national FFA convention will be ineligible for consideration.

Once a student has qualified and is certified as a state representative in the agriscience fair, if he/ she moves to a different chapter or a different state he/she may be allowed to compete in the national event with the school with which they qualified during the qualifying year. Certification forms submitted to the national FFA will be the only list accepted.

Extension of Agriscience Fair Projects

The completion of a research project can generate additional research questions that are worthy of investigation. Participants will have the opportunity to conduct this additional research as long as the current year's project could not have been done without what was learned from the past year's research. This project would now be considered an extension project for competition.

1. Students may use findings of previous research to formulate their research hypothesis; however, the student will be evaluated on research they have conducted in the twelve months prior to June 15 annually.
2. Judging will be based on the current year of research, not the entire scope of the research project. The project must document that the additional research is an expansion based on findings of prior work (e.g. testing a new variable or new line of investigation, etc.) Repetition of previous experiments with the same methodology and research question or increasing sample size are examples of unacceptable extensions. The logbook, project display and project report must reflect the current year's work only.
3. Displays and application materials must reflect the current year's work only. The project title displayed in the finalist's booth may mention years (e.g., "Year Two of an Ongoing Study"). Supporting data books (not research papers) from previous related research may be exhibited on the table properly labeled as such.
4. Longitudinal studies are permitted under the following conditions:
   a. The study is a multi-year study testing or documenting the same variables in which time is a critical variable. (e.g., Effect of high rain or drought on soil in a given basin; return of flora and fauna in a burned area over time.)
   b. Each consecutive year must demonstrate time-based change.
   c. The display board must be based on collective past data and its comparison to the current year data set. No raw data from previous years may be displayed.
5. All extension projects must be reviewed and approved each year and forms must be completed for each year.
6. Successive year projects must indicate change or growth in the project from the previous year(s) in the logbooks and complete the continuation form in the application. Displays must reflect the current year's work only.

   NOTE: For an extension project to be eligible for competition in the agriscience fair, documentation must include the **project extension form, the current year's abstract and the abstract for all other prior years**. The documentation should be clearly labeled in the upper right hand corner with the year (i.e., 2012-2013). Please retain all prior years' paperwork in case event officials request additional documentation.

Causes for Disqualification

1. Failure to meet any one or more of the eligibility rules set forth in this chapter.
2. Failure to follow the participation guidelines for this event set forth in this chapter.
3. Failure to meet certification and form requirements specified in this chapter.
4. Once judging has begun, any assistance given to a team or participant from any source other than the agriscience fair officials or assistants will be sufficient cause to disqualify participant(s).
5. Event superintendents may remove any participants who are being hazardous either to themselves or others. Such removal will constitute as an immediate disqualification from the agriscience fair.
6. Once a participant starts the event, he/she must complete it or face disqualification, unless prior permission from the event superintendent has been obtained.
7. Other than those approved by the event officials, participants will not be allowed to utilize personal electronic communication devices during the entire course of the event.
8. No advisor, coach, parent or fellow chapter member will be allowed in the judging area once judging officially begins. Any advisor, coach, parent or fellow chapter member found to do so may disqualify their participant.
9. Any participant, advisor or chapter member tampering with another participant's display will lead to their chapter participant's disqualification.
10. The official maximum size for a project is 48 inches wide by 30 inches deep (the distance from front to back) by 108 inches high (from floor to top, including table). Failure to meet these requirements will result in disqualification. See Display requirements for more information.

Required Forms

As a part of the national competition application process, the following forms are required. These forms must be postmarked to the National FFA Organization no later than July 15, the national agriscience fair application and certification deadline. The required forms are located in the application, are as follows:

- Research Paper
- Registration Form
- Research Plan Approval
- Adult Sponsor Checklist
- Hazardous Material Waiver
- Human Vertebrate Endorsement
- Non-Human Vertebrate Endorsement
- Research Expenses
- Electricity/Media Form
- Project Extension Form (if needed)
- Previous Year Abstract (if needed)

If the above forms are not postmarked by July 15, the fair participant(s) will be disqualified.

Agriscience Fair Prequalifying

All students qualified to participate in the National FFA Agriscience Fair must have their final written research report, entry form and all supporting certification forms postmarked to the National FFA Center by **July 15**. Incomplete submissions will be disqualified. The top 15 applicants in each category and division, as determined by a screening panel, will be certified to participate at the National FFA Agriscience Fair. Please review the prequalifying score sheet and rubric on page 15-17.

Scores from the written report submitted for prequalify will count as 25% of the overall score of the agriscience fair. Interview judges at the agriscience fair will not see the scores from the written report.

Recognition

Chapter Level – Winners may be selected annually in each FFA chapter. The winner can represent any of the agriscience category areas (based on state rules for competitions).

State Level – Winners from each division in all categories may be selected annually in each of the chartered state associations. Each of those winners should be sent to the National FFA Center for prescreening before moving on to compete at the national level fair. See **Agriscience Fair – Prequalifying (above).**

National Level – Selected participants from each state may be forwarded for national competition. A national winner will be selected in each category. National winners will be presented with pins and plaques at the awards reception during the national convention. Additional awards may become available as funded by special project sponsors above and beyond the core sponsorship for the National FFA Agriscience Fair. They may include, but are not limited to, scholarships and cash awards to category/division winners. These awards will be appropriate for each category/division, but not necessarily equal or identical.

Project Components

Logbook

Your logbook is one of the most important pieces of your project. It will contain accurate and detailed notes of a well-planned, implemented project. Your notes should be a consistent and thorough record of your project. These notes will be your greatest aid when writing your paper.

Written Report

Your full written report and application must be postmarked to the National FFA Center by July 15 for prescreening.

Title Page

Your title should be a precise description of the work performed. The title page should include the title of your project, your name, grade, school and school address. This should be all that appears on this page. The title itself should be no more than three lines with a 15 word maximum. All numbers, chemical elements and compounds should be spelled out. All words should be capitalized except for articles (such as "a" and "the"), prepositions (such as "of," "in," "on," "during" and "between") and conjunctions (such as "and" and "but") unless they are the first word of the title.

Abstract

An abstract is a brief summary of your paper, which concisely describes your purpose, methods, results and conclusion. Do not include the title in the abstract. Your abstract may include potential research applications or future research. The abstract should not contain cited references. It should be no longer than one page and in paragraph form. Because this is the first page of your project report, it will be where the reader forms an opinion on your work. In your abstract, arrange your points as 1) Purpose, 2) Procedure, 3) Conclusion. These sections would include materials used, effects of major treatments and main conclusions. Do not include discussion, citations and footnotes, or references to tables and figures or methods.

Introduction

The introduction answers the question "Why was the work done?" Provide background on your subject in several paragraphs. The introduction should clearly state the problem that justifies conducting the research, the purpose of the research, the findings of earlier work and the general approach and objectives. You must cite sources for statements that are not common knowledge. The last paragraph of the introduction includes the objectives of the study.

Review of Literature

The literature review should detail to the reader what information currently exists concerning your research project. Information listed in your review should be materials that you have used for your research. Material cited could include articles about similar studies, similar research methods, history of the research area and any other items that support the current knowledge base for the research topic and how your project might complement existing information.

Materials and Methods
A well-written materials and methods section will enable others to reproduce your results by duplicating your study. Write in past tense, third person, encompassing all of the materials required and explaining the technical and experimental procedures employed. With fieldwork, describe the study site. Include any statistical procedures employed.

Results
This section should be a summary of the results your project has produced, even if they were not what you expected. Do not include discussion or conclusions about the data. Tell the reader exactly what you discovered and what patterns, trends or relationships were observed. Decide on the most meaningful way to present your data (tables, figures) and refer to them in your text.

Discussion and Conclusion
In this section draw conclusions from the results of your study and relate them to the original hypothesis. It is helpful to briefly recap the results and use them as a foundation for your conclusions. If your results were not what you expected, take this opportunity to explain why. Give details about your results and observations by elaborating on the mechanisms behind what happened. Tie your study in with the literature, but do not hesitate to offer sound reasoning of your own.

References
Only significant, published and relevant sources accessible through a library or an information system should be included. All citations in the text must be included in the reference section. When you use information or facts that are not common knowledge, you must give credit to the source of that information by citing a reference. You should use the APA style recognized citation system throughout your report.

Acknowledgements
Acknowledge anyone who helped in any aspect of your project in this section.

Format of Report
The report should be printed on 8 1/2" x 11" white bond paper. The report will have 1" margins. Font size must be 12 using Arial, Courier or Times New Roman font. The APA style recognized citation system should be used throughout the report.

Display

Each exhibit should include information relevant to the study and any objects the student wishes to display. All projects must have the following information attached to the exhibit:

- Name of person(s) responsible for developing the project
- Chapter name, state
- Title of category entered
- Division entered (I, II, III or IV)

Preferred Display Requirements
It is preferred that national agriscience fair participants display the results of their study utilizing a standard printed poster with dimensions of 36 inches (height) by 48 inches (width).

Posters can be created utilizing Microsoft PowerPoint™ slide format. The display should be stable and free standing on the provided table top. Each participant is responsible for providing backing for the poster. The display may include any objects the student wishes to exhibit, as long as they adhere to safety guidelines.

Standard Display Requirements

A standard display should consist of one or more panels of information and any objects the student wishes to display within safety guidelines. The exhibit panels must be constructed to be stable and free standing.

The maximum size for a project is 48 inches wide by 30 inches deep (the distance from front to back) by 108 inches high (from floor to top of display, this includes the table and project). At the National FFA Agriscience Fair, tables will be provided and will not exceed a height of 36 inches. Failure to meet these requirements will result in disqualification.

Interview

The interview is an opportunity for judges to ask you questions about your project. Interviews for agriscience fair participants will normally be 5-15 minutes. The interview portion is used to help judges determine both the extent to which you actually participated in the project and your knowledge gained. **A team project must be presented by a team of two.** Judges will ask questions to determine your understanding of your project; how it relates to your SAE and possibly how your project relates to other FFA activities. The following is a list of example questions that may be asked.

1. How and why was the project selected?
2. What was your goal? What did you plan to accomplish in your project?
3. Were there any surprises in your project? How did you deal with them?
4. What did you learn from the experience?
5. How much time did you devote to your project?
6. What kept you from being discouraged?
7. How did you manage time for this project in relation to your other activities?
8. What would you advise others doing a project? What is the value of a project of this type?
9. How can your findings and conclusions be applied in the agriculture, food and natural resources industry?

References and Resources

Agriscience Fair Prequalifying Score Sheet

Student(s) :_____State:_____

Category: _____ Division: _____

Each category should be scored separately as determined by point values listed. The total possible score for the entire sheet is 100 points.

____ 5 pts. Title Page: Title precisely describes the work with no more than 3 lines and 15 words maximum. All numbers, chemical elements and compounds should be spelled out. Page should include student name, grade, school and school address.

_____ 10 pts. Abstract: Abstract is brief and concisely describes the purpose, methods, results and conclusion. Abstract should not include the title or cited references. It should be no longer than one page. Arrangement of information should make the purpose, procedure and conclusion clear.

_____ 10 pts. Introduction: Introduction should answer the question "Why was the work done?" It should clearly state the problem that justifies conducting the research, the purpose of the research, the findings of earlier work and the general approach and objectives. It should include the hypothesis/objectives and/or predictions.

_____ 20 pts. Materials and Methods: The materials and methods section should enable others to reproduce the results by duplicating the study. It should be written in third person and encompass all of the materials required. It should include statistical procedure if employed.

_____ 20 pts. Results: This section should be a summary of the results the project has produced. Trends and relationships are clearly addressed, but no conclusions should be made. Section should include data (tables, figures) that can stand alone and include headings, labels and proper units of measure. Captions for each table are placed above the table and a caption for a figure is placed below the figure. Both are at least two point sizes smaller than the point size of the figure's text and are single spaced.

_____ 25 pts. Discussion/Conclusions: This section should show that the conclusions were drawn from the results of the study and how the results relate to the hypothesis. It should contain a brief recap of the results and show how the results were a foundation for the study. Explanations should be clear if the results were not as expected. Sound reasoning is used to make conclusions that rely on both literature and results. Discussion should reference facts and figures from results section. Conclusion should be editorial in nature.

_____ 5 pts. References/Literature Cited: References should contain significant, published and relevant sources. APA style recognized citation is used throughout the report.

_____ 5 pts. Acknowledgements: This section should include a list or paragraph acknowledging anyone who helped in any aspect of the project and how they helped.

_____/100 TOTAL SCORE

In the event of a tie, qualification for the agriscience fair will be based on the scores received in the following sections in order: Discussions/Conclusions; Results; Materials and Methods.

Agriscience Fair Prequalifying Rubric

Area	Total Points Possible	High Points 5-4	Medium Points 3-2	Low Points 1-0	Points Earned
Title Page	5 Points	Title precisely describes the work with no more than 3 lines and 15 words maximum. All numbers, chemical elements and compounds should be spelled out. Page should include student name, grade, school and school address. No spelling or grammar errors are present.	Title vaguely describes the work with no more than 3 lines and 15 words maximum. All numbers, chemical elements and compounds should be spelled out. Page should include student name, grade, school and school address. Minor spelling or grammar errors are present.	Title poorly describes the work and includes more than 3 lines and 15 words maximum. All numbers, chemical elements and compounds are not spelled out. Page should include student name, grade, school and school address. Excessive spelling or grammar errors are present.	
Area	**Total Points Possible**	**High Points 5-4**	**Medium Points 3-2**	**Low Points 1-0**	**Points Earned**
Abstract	10 Points Weighted Area	Abstract is brief and concisely describes the purpose, methods, results and conclusion. Abstract does not include title or cited references. Abstract is no longer than one page. Arrangement makes the purpose, procedure and conclusion clear. No spelling or grammar errors are present.	Abstract describes the purpose, methods, results and conclusion. Abstract does not include title or cited references. Abstract is longer than one page. Arrangement makes the purpose, procedure and conclusion vague. Minor spelling or grammar errors are present.	Abstract is poorly describes the purpose, methods, results and conclusion. Abstract includes title or cited references. Abstract is longer than one page. Arrangement makes the purpose, procedure and conclusion are not clear. Excessive spelling or grammar errors are present.	_____X 2 =_____
Area	**Total Points Possible**	**High Points 5-4**	**Medium Points 3-2**	**Low Points 1-0**	**Points Earned**
Introduction	10 Points Weighted Area	Introduction answers the question "Why was the work done?" and clearly states the problem that justifies the research being conducted, purpose of research, findings of earlier work, general approach and objectives. Hypothesis is clearly stated. No spelling or grammar errors are present.	Introduction answers the question "Why was the work done?" and vaguely states the problem that justifies the research being conducted, purpose of research, findings of earlier work, general approach and objectives. Hypothesis is unclearly stated. Minor spelling or grammar errors are present.	Introduction does not answers the question "Why was the work done?" and does not states the problem that justifies the research being conducted, purpose of research, findings of earlier work, general approach and objectives. Hypothesis is not stated. Excessive spelling or grammar errors are present.	_____X 2 =_____

Area	Total Points Possible	High Points 5-4	Medium Points 3-2	Low Points 1-0	Points Earned
Materials and Methods	20 Points Weighted Area	Clearly wrote to enable others to reproduce the results duplicating the study. Section is wrote in third person and encompasses all materials required for the research. If used, the statistical procedure is included. No spelling or grammar errors are present.	Not written clearly to enable others to reproduce the results duplicating the study. Section may or may not be written in third person and encompasses all materials required for the research. the statistical procedure are included but are unclear. Minor spelling or grammar errors are present.	Written poorly so that others cannot reproduce the results duplicating the study. Section is not written in third person and does not encompasses all materials required for the research. The statistical procedure are not included. Excessive spelling or grammar errors are present.	_____ X4 =_____ –
Area	**Total Points Possible**	**High Points 5-4**	**Medium Points 3-2**	**Low Points 1-0**	**Points Earned**
Results	20 Points Weighted Area	Results of the project are summarized. Trends and relationships are clearly addressed. No conclusions are made in this section. Data that can stand alone in the form of tables and/or figures are included. Tables/figures should have headings, labels and proper use of measurement. Captions are included for each table/figure and are at least 2 font sizes smaller than font in table/figure and are single spaced. No spelling or grammar errors are present.	Results of the project are incompletely summarized. Trends and relationships are vague. No conclusions are made in this section. Data that can stand alone in the form of tables and/or figures are sometimes included. Tables/figures should have headings, labels and proper use of measurement. Captions are included for each table/figure and are at least 2 font sizes smaller than font in table/figure and are single spaced. Minor spelling or grammar errors are present.	Results of the project are poorly summarized. Trends and relationships are not addressed. Data that is not appropriately included as tables and figures and lacks heading, labels and proper use of measurement. Captions are not included for each table/figure. Excessive spelling or grammar errors are present.	_____ X4 =_____ –

Area	Total Points Possible	High Points 5-4	Medium Points 3-2	Low Points 1-0	Points Earned
Discussion/ Conclusion	25 Points Weighted Area	Conclusions are clearly drawn directly from the results of the study and relate directly to the hypothesis. Brief recap of the results is included and shown how they were foundation of the study. Sound reasoning is shown that conclusions are based on results and literature. Discussion refers to facts and figures in the results section. No spelling or grammar errors are present.	Conclusions are unclearly drawn directly from the results of the study and partially relate directly to the hypothesis. Brief recap of the results is included and shown how they were foundation of the study. Unsound reasoning is shown that conclusions are based on results and literature. Discussion refers to facts and figures in the results section. Minor spelling or grammar errors are present.	Conclusions are not drawn directly from the results of the study and do not relate directly to the hypothesis. No recap of the results is included or poorly shows how they were foundation for the study. Conclusions are not based on results or literature. Discussion poorly refers to the facts and figures in the results section. Excessive spelling or grammar errors are present.	_____X 5 =_____
Area	**Total Points Possible**	**High Points 5-4**	**Medium Points 3-2**	**Low Points 1-0**	**Points Earned**
References/ Literature Cited	5 Points	References listed are significant, published and relevant sources. APA citation style is used. No spelling or grammar errors are present.	References listed are somewhat significant, published and relevant sources. APA citation style is used. Minor spelling or grammar errors are present.	References listed are not significant, published and relevant sources. APA citation style is not used. Excessive spelling or grammar errors are present.	
Area	**Total Points Possible**	**High Points 5-4**	**Medium Points 3-2**	**Low Points 1-0**	**Points Earned**
Acknowledgements	5 Points	Detailed list or paragraph is included acknowledging anyone who assisted with any aspect of the project and how they helped. No spelling or grammar errors are present.	A list or paragraph is included acknowledging anyone who assisted with any aspect of the project. Minor spelling or grammar errors are present.	A list or paragraph is not included acknowledging anyone who assisted with any aspect of the project and how they helped. Excessive spelling or grammar errors are present.	
				Total Points = 100	

National FFA Agriscience Fair Score Sheet

Student(s) :_____**State:**_____

Category: _____ **Division:** _____

_____ **15 pts. Knowledge Gained -** Is there evidence that the student has acquired scientific skills and/or knowledge by doing this project? Does the exhibitor recognize the scope and limitation of the problem he/she has selected?

_____ **15 pts. Scientific Approach -** Has the problem been clearly stated? Has the exhibitor solved the problem by using scientific facts as a basis for new conclusions? Is the exhibitor aware of the basic scientific principles that lend support to the methods used and the conclusions reached?

_____ **15 pts. Experimental Research** - Has data been gathered from work done by the student, rather than the results from the work of others? Is the exhibitor's equipment effective? Does it do what it was intended to do? Can the research be the basis for further experimentation? Is the project actually a model or demonstration? Have variables been clearly identified and controlled for in the research process?

_____ **15 pts. Individual/Team Work -** Has material been gathered and cited using an appropriate format? Is the logbook present for examination? Does the log book contain detailed information about the research process? If this was a team project, is there evidence of collaboration present? Identify the portions of the presentation representing the work of others.

_____ **15 pts. Thoroughness -** Is the exhibitor aware of the empirical method (the necessity of repeating trials) and the importance of controlling the variables in the experimentation in order to reach valid conclusions? Has the analysis of the problem been orderly? Have procedures been outlined in a step-by-step fashion? How successfully was the original plan carried through to completion?

_____ **15 pts. Information -** Are known facts and principles stated correctly and used accurately? Have the results of experiments been reported accurately even though faulty experimental methods or conditions may have made the data unreliable? If so, have these errors been noted?

_____ **15 pts. Results/Conclusions -** Has the exhibitor started with known facts and drawn their own conclusions? Are the conclusions consistent with the data and/or observations? Is information provided as to what was learned as a result of research?

_____ **15 pts. Interview -** Is the exhibitor able to communicate their knowledge of the project?

_____ **15 pts. Visual Display -** Has the data been presented in the best manner for the particular type of information involved? Are spelling errors present? Does the exhibit demonstrate a general neatness and attractiveness? Is the display presented in a logical and interesting manner?

_____ **45 pts. Written Project Report – (Scored during prescreening process)** Are all components of the written report available? Has the exhibitor made thorough use of the data, literature cited, interviews, correspondence, etc. and noted them properly? Considering the age and experience of the exhibitor, does the project make use of their abilities?

_____/180 TOTAL SCORE

In the event of a tie, winner will be determined based on the score of the written project report. If a tie still exists, the tie will be broken on scores received in the following sections in order: Interview, Thoroughness, Information and Results/Conclusions.

Research Plan Approval Form

1. **Student Acknowledgment:** I understand the risks and possible dangers to me in the Research Plan. I will adhere to all rules and guidelines as listed in the handbook when conducting this research. The project I am submitting is the result of my own effort and ability. I have provided appropriate citations for all of my references.

Student's Printed Name	Signature	Date
Student's Printed Name (If team)	Signature	Date

2. **Adult Sponsor Approval:** I have read the Research Plan prior to experimentation and reviewed the Checklist for Adult Sponsor with the student. I agree to sponsor the student and assume reasonable responsibility for compliance with all rules.

Adult Sponsor's Printed Name	Signature	Date

3. **Parent/Guardian Approval:** I have read and understand the risks and possible dangers involved in the Research Plan. I give my consent to my child prior to participating in this research.

Parent's/Guardian's Printed Name	Signature	Date

THIS FORM IS REQUIRED FOR NATIONAL FFA COMPETITION

Adult Sponsor Checklist

On behalf of the student(s) _____
and _____

_____ 1 I have reviewed the Research Plan Approval Form.

_____ 2 The student and a parent/guardian have reviewed the Research Plan Approval Form.

_____ 3 This project involves the following area(s) and had prior approval before experimentation.

___Human Subjects
___Non-human Vertebrate Animals
___Pathogenic Agents
___Controlled Substances
___Recombinant DNA
___Human or Animal Tissue

_____ 4 This project does not involve any of the research areas listed in #3.

_____ 5 This project involves the hazardous substances or devices checked below. Prior approval by the adult sponsor and a designated supervisor was obtained.

_____ - **Chemicals** (i.e., hazardous, flammable, explosive or highly toxic: carcinogens; mutagens and all pesticides). I have reviewed with the student the Safety Sheet for each chemical that was used. I also reviewed the proper safety standard for each chemical including toxicity data, proper handling techniques, and disposal methods. For Safety in Academic Chemistry Laboratories, write to the American Chemical Society, Career Publications, 1155 16th St., NW, Washington, DC 20036 (202-872-4512).

_____ - **Equipment** (i.e., welders; voltage greater than 220 volts). I have reviewed with the student proper operational procedures and safety precautions for the equipment.

_____ - **Firearms** I have reviewed with the student the proper safety standards for firearms use.

_____ - **Radioactive Substances** I have reviewed the proper safety standards for each radioactive substance with the student prior to experimentation.

_____ - **Radiation** (i.e., x-ray or nuclear; unshielded ionizing radiation of 100-400 nm wavelength) I have reviewed with the student the proper safety methods concerning the type of radiation the student used prior to experimentation.

_____	_____	_____
Adult Sponsor Printed Name	Adult Sponsor Signature	Date

THIS FORM IS REQUIRED FOR NATIONAL FFA COMPETITION

Hazardous Materials Waiver Form

Please list below all of the hazardous substances used in this research. Include all safety precautions taken and the proper disposal procedures:

The applicant, by signing below, agrees to the regulations included regarding the use of hazardous materials.

I certify that I have followed the above listed safety precautions and disposal procedures.

_____
Student Signature

_____
(If team) Student Signature

THIS FORM IS REQUIRED FOR NATIONAL FFA COMPETITION

Human Vertebrate Form

Recognizing that human beings are vertebrate animals and yet need different criteria than nonhuman vertebrates, the following policies will govern the use of human beings.

1. No projects involving human cultures of any type (mouth, throat, skin or otherwise) are allowed. However, tissue cultures purchased from reputable biological supply houses or research facilities are suitable for student use.
2. Projects that involve taste, color, texture or any other choice are allowed, but are limited to preference only. Quantities of normal food and non-alcoholic beverages are limited to normal serving amounts or less. No project may use drugs, food or beverages in order to measure their effect on a person.
3. The only human blood that may be used is that which is either obtained through a blood bank, hospital or laboratory. No blood may be drawn by any person or from any person specifically for a science project. This rule does not preclude a student making use of the data collected from blood tests not made exclusively for a science project.
4. Projects that involve exercise and its effect on pulse, respiration rate and blood pressure are approved, if valid, normal physical examination is on file and the exercise is not carried to extreme.
5. Projects that involve learning, ESP, motivation, hearing, vision and surveys are allowed.
6. No project will be allowed that is in violation of these rules. No person may perform any experiment for the student that violates any of the rules.

In this space, briefly describe the use of humans in your project. Use the back of this page if necessary.

The signatures of the student(s) and the advisor indicate this project conforms to the above rules.

_____
Student Signature

_____
Advisor Signature

_____
(If team) Student Signature

THIS FORM IS REQUIRED FOR NATIONAL FFA COMPETITION

Non-Human Vertebrate Form

These rules are strictly enforced. Students and advisors using non-human vertebrates in their project must complete this form. The signature of the student and the advisor indicate the project was done within the rules and regulations of national FFA Agriscience Fair rules and guidelines in accordance with the use of non-human vertebrate.

1. Intrusive techniques used cannot exceed momentary pain and must comply with commonly accepted livestock management procedures.
2. Changing an organism's normal environment by using either aversive stimuli or predatory/prey conditions to study behavior/operant conditioning is prohibited.
3. Food and water cannot be used or withheld for more than 24 hours for maze running and other learning or conditioning activities.
4. The student and advisor have the responsibility to see that animals are properly cared for in a well-ventilated, lighted and warm location with adequate food, water and sanitary conditions. Care must be taken to see that organisms are properly cared for during weekends and vacation periods.
5. Chicken or other bird embryo projects must be terminated at or before ninety-six hours.
6. Projects that involve behavioral studies or newly hatched chickens or other birds will be allowed, provided no change has been made in the normal incubation and hatching of the organism and all vertebrate rules are followed.

In this space, briefly describe the use of vertebrate animals in your project. Use the back of this page if necessary.

The signatures of the student(s) and the FFA Advisor indicate this project conforms to the above rules.

_____ _____

Student Signature Advisor Signature

_____

(If Team) Student Signature

THIS FORM IS REQUIRED FOR NATIONAL FFA COMPETITION

Research Expenses

List all expense items used in your research project. The cost per item is recorded in Column 3; the amount paid by student in Column 5 and the expenses paid by someone else in Column 6. Identify the other sources of funding in Column 7.

RESEARCH PROJECT EXPENSES						
1	2	3	4	5	6	7
EXPENSE ITEMS	NUMBER OF UNITS	PRICE PER UNIT	TOTAL	AMOUNT FUNDED BY STUDENT	AMOUNT FUNDED BY OTHER SOURCES	NAME OF FUNDING SOURCE
TOTALS						

THIS FORM IS REQUIRED FOR NATIONAL COMPETITION

Project Extension Form

Required for projects that are an extension from a previous project submitted for competition. This form must be accompanied by the previous year's abstract.

1A. Current Research Project Title _____

1B. Previous Research Project Title _____

2. Changes in Objective

3. Changes in Methodology

4. Variables Studied

5. How did this project emerge from the previous project?

Attached: Current Project Abstract and Previous Year's Project Abstract

I hereby certify that the above information is correct and that the current year abstract and project display board properly reflect work done only in the current year.

Student Printed Name	Student Signature	Date
Student Printed Name	Student Signature	Date
Advisor Printed Name	Advisor Signature	Date

THIS FORM IS REQUIRED FOR NATIONAL FFA COMPETITION IF APPLICABLE

Sample Logbook

You must keep careful records of all that you do and all that happens during your project. This should be in the form of a daily diary called a logbook.

Sample Logbook

Date: 1/13/11
Today I checked my plants at 12:30 p.m. I noticed that Group A seems to be growing faster than groups B, C and D. Specifically, plant A_2 seems to be growing the best. The plants in Group A are not just taller, but seem to be greener and healthier. It is interesting to note that the plant with the longest root development is plant C_3. I do not know the reason for this. Here is a chart of my results for today:

Plant	Height in cm.	# of Leaves	Root length in cm.	Observations
A1	5	4	3.1	Has not grown
A2	5.2	5	3.4	Has a new leaf
A3	5.3	4	3.4	Is tallest in the group
B1	4.9	4	3.1	Has not changed
B2	4.8	4	3.0	Has not shown growth
B3	4.8	5	2.5	Poor root growth
C1	5.0	4	2.3	Poor root growth
C2	4.3	5	3.4	Lowest height
C3	4.5	4	4.2	Longest roots
D1	4.3	4	3.2	Lowest height
D2	4.7	4	2.9	Low root growth
D3	4.4	4	2.0	Least root development

- ✓ Notice there are comments and a chart for each entry.
- ✓ Developing an outline template for the logbook and photocopying a page for each daily entry can be helpful.
- ✓ The logbook can be created either in a notebook or as a collection of pages.
- ✓ Use a separate page for each daily entry.

Helpful but NOT required for national judging

Research Skills, Competencies and Knowledge

List all major skills, competencies and knowledge gained during the completion of research projects.

DATE	SKILLS, COMPETENCIES & KNOWLEDGE	STUDENT HOURS

Helpful but NOT required for national judging

Research Plan

Submit this completed form to _____. Type or print all information requested. Answer every question.

1) Student's Name _____ Grade _____

2) Title of Project_____

3) Adult Sponsor_____

4) Is this an extension from a previous year? ___Yes ___No
(If yes, attach previous year's abstract and completed Form 1)
If yes, explain how this project is new and different from last year:
_____
_____

5) This year's experiment will begin: (month, day, year)
anticipated to end: (month, day, year)

6) Where will you complete your lab work?

7) Name, address & phone of school and work site(s): School: Work Site: Work Site:

8) Check ALL items that apply to your research:
_____Humans
_____Non-human Vertebrate Animals
_____Recombinant DNA
_____Pathogens
_____Controlled Substances
_____Human/Animal Tissue
The following area requires approval by an Adult Sponsor and Designated Supervisor prior to experimentation:
_____Hazardous Substances or Devices

9) Attach separate typed (or computer printout) research proposal to include the following:
A. Problem or question to address
B. Hypothesis
C. Description in detail of method or procedures (including chemical concentrations and drug dosages)
D. Review of Literature

10) An abstract is required for all projects after experimentation.

Helpful but NOT required for national judging

Research Proposal Cover Sheet - Sample

Date:_____

Submit one original and three copies to:
Research Committee
Anywhere High School

I submit for approval the following proposal of my experiment:

Course:

Tentative Title: (The title should be concise and the nature of the proposed research clearly stated.)

This proposal includes _____attached sheets. (Proposals should not normally exceed 10 pages in length.)

On attached sheets, present concise information covering the following:

1. Objectives: (Make a clear statement of the results you hope to accomplish through the proposed research.)
2. Present status of the question: (Summarize the previous research in this information area, especially citing any gaps the study may help to fill. Include definite citations in your summary.)
3. Procedure: (Indicate clearly the methods you will use in gathering and analyzing data to accomplish the objectives.)

APPROVAL RECOMMENDED:

_____		_____
(Name)	Committee Chair	Signature of Student(s)
_____		_____
(Name)	Member	Student(s) Name(s) Printed
_____		_____
(Name)	Member	Class in School
_____		_____
(Name)	Member	Approval Date

Project Extension Form — Sample

Required for projects that are an extension from a previous project submitted for competition. This form must be accompanies by the previous year's abstract

1A. Current Research Project Title Effects of Water Temperature on Hydroponic Growth

1B. Previous Research Project Title White vs. Black Containers for Hydroponic Systems

2. Changes in Objective

The objective of my first research project was to explore how the color of the container affected the plant growth; this new research project that came about from the original will focus on the effects of water temperature on plant growth.

3. Changes in Methodology

The major changes that I made to the methodology were to use the exact same containers, locate them within close proximity and keep all variables constant. To create the temperature difference in the systems a water heater and/or cooler was added to the system to regulate the temperature.

4. Variables Studied

The new variable that was tested in this research project was the water temperature in the hydroponics system. The measured factors continued to be plant height, leaf area and leaf greenness.

5. How did this project emerge from the previous project?

My previous project compared plant growth in white vs. black containers. I was researching the differences of light amounts have on plant growth. From this study, I noticed that the water temperature in the two systems was different due to the amount of light allowed to reach the water and increase its temperature. Therefore, I developed a new research project and hypothesis on the water temperature's effects on the growth of plants.

Attached: Current Project Abstract and Previous Year's Project Abstract

I hereby certify that the above information is correct and that the current year abstract and project display board properly reflect work done only in the current year.

Student Printed Name	Student Signature	Date
Student Printed Name	Student Signature	Date
Advisor Printed Name	Advisor Signature	Date

THIS FORM IS REQUIRED FOR NATIONAL FFA COMPETITION IF APPLICABLE