

Arthur Berkey
Agriculture, Food, & Natural
Resources (AFNR)
Science Fair
Handbook 2027

Table of Contents

Arthur Berkey AFNR Science Fair Goal	1
AFNR Science Fair Objectives and Rules	1
Pathways and Divisions of the AFNR Science Fair	2
Division Research Definitions	3
Science Fair Qualification Process	3
Science Fair Final Presentation Rules.....	4
AFNR Science Fair Research Paper Scoring.....	5
Research Paper Components (Divisions 1, 3, 5).....	6
Research Paper Components (Divisions 2, 4, 6).....	7
AFNR Science Fair Video and Final Presentation Rubric.....	8
AFNR Science Fair Video Uploading Procedures.....	9
Arthur Berkey AFNR Science Fair Resources	11

Arthur Berkey Agriculture, Food, & Natural Resources (AFNR) Science Fair Handbook 2027

Arthur Berkey AFNR Science Fair Event Goal

The goal of the Arthur Berkey AFNR Science Fair is to provide junior high and high school students (grades 7-12) with an opportunity to develop and disseminate scientific research in agriculture, food, and natural resources broadly defined. **ALL science fair projects are individual project (there are no longer team projects).**

Arthur Berkey AFNR Science Fair Objectives and Rules

Objectives

1. To provide an opportunity for students to develop and disseminate agriculture, food, or natural resources research.
2. To acquire knowledge and skills in agriculture, food, and natural resources research.
3. To become knowledgeable of, and familiar with, a wide variety of research techniques.
4. To understand the principles and fundamentals of research in agriculture, food, and natural resources.
5. To further the opportunities for students to become proficient in the techniques used by agriculture, food, and natural resources researchers.
6. To promote the opportunities for agriculture, food, and natural resources research as a career.
7. To promote career choices by providing an opportunity for individuals to become acquainted with professional researchers in academia and industrial fields.
8. To foster leadership and communication skills, and SAE through AFNR research.

Divisions and Categories of the AFNR Science Fair

Pathway	Division	Division Research Type	Current Grade Level
Animal Systems	1	Experimental	7-9
Animal Systems	2	Experimental	10-12
Animal Systems	3	Analytical	7-9
Animal Systems	4	Analytical	10-12
Animal Systems	5	Invention	7-9
Animal Systems	6	Invention	10-12
Environmental Services/Natural Resource Systems	1	Experimental	7-9
Environmental Services/Natural Resource Systems	2	Experimental	10-12
Environmental Services/Natural Resource Systems	3	Analytical	7-9
Environmental Services/Natural Resource Systems	4	Analytical	10-12
Environmental Services/Natural Resource Systems	5	Invention	7-9
Environmental Services/Natural Resource Systems	6	Invention	10-12
Food Products and Processing Systems	1	Experimental	7-9
Food Products and Processing Systems	2	Experimental	10-12
Food Products and Processing Systems	3	Analytical	7-9
Food Products and Processing Systems	4	Analytical	10-12
Food Products and Processing Systems	5	Invention	7-9
Food Products and Processing Systems	6	Invention	10-12
Plant Systems	1	Experimental	7-9
Plant Systems	2	Experimental	10-12
Plant Systems	3	Analytical	7-9
Plant Systems	4	Analytical	10-12
Plant Systems	5	Invention	7-9
Plant Systems	6	Invention	10-12
Power, Structural and Technical Systems	1	Experimental	7-9
Power, Structural and Technical Systems	2	Experimental	10-12
Power, Structural and Technical Systems	3	Analytical	7-9
Power, Structural and Technical Systems	4	Analytical	10-12
Power, Structural and Technical Systems	5	Invention	7-9
Power, Structural and Technical Systems	6	Invention	10-12
Social Systems	1	Experimental	7-9
Social Systems	2	Experimental	10-12
Social Systems	3	Analytical	7-9
Social Systems	4	Analytical	10-12
Social Systems	5	Invention	7-9
Social Systems	6	Invention	10-12

Division Research Type Definitions

Experimental Research – Involves the application of the scientific method to control certain variables while manipulating others to observe the outcome. Students will define a hypothesis, determine an appropriate experimental design, conduct the research, collect the data, draw conclusions from the data and recommend further research that can be done.

Analytical Research – Often begins with a question that asks why or how something occurs, followed by a period of data collection using qualitative and/or quantitative methodologies. Students will conduct an analysis of data, facts and other information to determine the answer to the question posed.

Invention Research – Applies engineering design process to create a new product or service. This type of research often begins with the identification of a need and the development of a product followed by a design process of prototyping and testing those results in a product that meets the identified need.

Science Fair Qualification Process (Three Stage Process)

1. **Preliminary Judging Stage** – Students will upload and submit a complete research paper and video as part of the preliminary judging process for the Science Fair. This judging process is to determine the top 3 participants in each Pathway and Division. Preliminary judging will require students to do the following steps.
 - a. **Research Paper** – Students will develop a research paper as part of their science fair project. The link for uploading student information and the research paper will be provided prior to the due date. Initial judging of research papers will be due in mid-January (NOTE - The specific date may change slightly from year-to-year, see <https://michiganffa.org/association/calendar> for specific dates). Research paper components are listed below (pg. 5 [Divisions 1, 3, 5], pg. 6 [Divisions 2, 4, 6]). **The research paper will account for 70% of the preliminary score.**
 - b. **Presentation Video** – Students will develop a 10-minute video presentation highlighting their research (See rubric below for grading criteria, pg. 7). The grading criteria below (pg. 7) will be used across all divisions and categories. Students may use any appropriate presentation software (e.g., Powerpoint, Zoom, Camtasia, Canva, etc.) and means to video their presentation. Once completed, the video will be uploaded as an “unlisted” YouTube video link. This link will be uploaded to the submission form link provided to students when uploading their research paper. Videos will NOT be edited.

Edited videos will result in a zero score for the presentation video portion of the contest. **The presentation video will account for 30% of the preliminary score.**

Student scores for the research paper and presentation video will be tallied with the top three from each Pathway/Division being invited to present the state finals during the Michigan FFA State Convention.

2. **Finals Presentation Stage (MI State FFA Convention)** – Students who score in the top 3 in each Pathway/Division from the preliminary judging will be invited to participate in the Arthur Berkey AFNR Science Fair Finals at Michigan State University during the Michigan State FFA Convention. Final presentations will be judged using the appropriate science fair rubrics highlighted below. Finals results will include the research paper/presentation video (30% of the final score) and final presentation at the Michigan State FFA Convention (70% of the final score).

Science Fair Final Presentation Rules (MI State FFA Convention)

1. Selected student presentation will register their poster at the appropriate venue at the Michigan State FFA Convention by noon the first day of convention. Display requirements are as follows:
 - Displays must include appropriate information including names of science fair participant(s), Chapter names, pathway, and division.
 - Display boards must be free standing with the dimensions of 36” x 48” wide and can be up to 30” deep. Height is based on top of table to top of display.
 - Displays must also include a copy of the research paper for reference and logbook.
 - No other materials, handouts, or electronic devices may be included with the display.
2. Students should be aware of their scheduled time to present their project to judges and arrive at their display 10-minutes prior to the scheduled presentation time.
3. Student presenters will provide a 5- to 10-minute overview of their poster to 2-3 unbiased judges. Judges will then provide 5- to 10-minutes of questions upon conclusion of the presentation.
4. Contact one of the contest coordinators prior to the judging of the posters if a conflict exists between the scheduled science fair presentation and another activity (e.g., FFA Band, contest, or other appropriate activity).
5. Upon conclusion of the presentation, students should leave the science fair display area until all judging has been completed.
6. Upon conclusion of the scoring, silver and bronze awards will be displayed at the appropriate science fair projects. State winners (gold awards) of each Pathway/Division will be recognized

on stage at an upcoming Michigan FFA session. Students and advisors should check the results the evening of the competition or the following morning to determine appropriate next steps.

7. Official dress **MAY** be worn by FFA members for this event. Official Dress for an FFA member includes:
 - An official FFA jacket zipped to the top.
 - Black slacks and black socks/nylons or black skirt and black nylons.
 - Skirt should be a minimum of knee length
 - Slacks should be full length
 - White collared blouse or white collared shirt.
 - Official FFA tie or official FFA scarf.
 - Black dress shoes with closed heel and toe.
 - Note: Medical or cultural adjustments to required official dress may be made with prior approval of contest/event chair. Also, appropriate personal protective equipment may be used with Official Dress. Junior high FFA members are allowed to wear FFA jackets, but it is optional. Participants in junior high contests should not be judged differently for wearing or not wearing a jacket.

8. State winners who are National FFA members may submit their research papers to the National FFA Organization's Agriscience Fair. Contact the Michigan FFA Executive Secretary for further details about submissions and timeline for submission.

AFNR Science Fair Research Paper Scoring

The Arthur Berkey AFNR Science Fair is modelled after the National FFA Agriscience Fair. As such, this contest uses the same scoring scoresheets and rubrics for the research paper (Prequalifying Scoresheet & Prequalifying Rubric). Use the following link from the National FFA Organization for scoring rubrics. <https://www.ffa.org/participate/awards/agriscience-fair/>

Research Paper Components (Divisions 1, 3, 5)

1. **Importance** – A brief summary of the paper, which concisely describes why the topic is important to the AFNR industry and what problem does this investigation solve for AFNR.
2. **Other’s Work** – This section should detail what information currently exists related to the research project. Reference where the information was found (website, book, article, etc.) is listed, then a paragraph written by the student researcher(s) clearly describing the reference information it provided for each publication.
3. **Materials and Methods** – This section of the research paper is a narrative of the process used to replicate this research. This section encompasses all materials required to conduct the student. If used, statistical procedures are included.
4. **Hypothesis/Anticipated Results** – Researcher clearly states the hypothesis and/or anticipated results.
5. **Results** – This section is a summary of the findings from the research. Tell the reader exactly what happened in a narrative while also including patterns and trends. Tables and figures are appropriate ways to highlight the data while referring to this information in the narrative. Data should not be added once the initial paper is written as this may change the discussion and conclusions.
6. **Discussion** – In this section, answer the following questions in a narrative format: 1) What do the results of the study mean? And how are the results related to what others found in the “Other’s Work” section?
7. **Conclusions** – This section includes two to three paragraphs describing the study conducted. The section also includes why the student researcher(s) chose to conduct the study, why the study was important to the AFNR industry, how the study was conducted, what was found by conducting the study, and how the results apply to the AFNR industry
8. **Acknowledgement** – This section is a paragraph that includes acknowledging anyone who assisted with any aspect of the project and how they helped.
9. **Skill Development** – This section includes three competencies (five AFNR Standards from their primary pathway, two AFNR Standards from any pathway, and three AFNR Standards from Career Ready Practice (CRP) and/or Cluster Skills (CS)).

Research Paper Components (Divisions 2, 4, 6)

1. **Abstract** – A brief summary of the paper, which concisely describes the purpose, methods, results, and conclusions. The abstract may include potential research applications or future research. The abstract should NOT contain cited references. The abstract should be no more than 200 words in length. Arrange the points of the abstract in the following order: 1) Purpose, 2) Procedure, 3) Results, and 4) Conclusions.
2. **Introduction** – This section should include the question of “why was the work done?” This section provides the background on the subject in a few paragraphs. The introduction should clearly state the problem that justifies conducting the research, the purpose of the research, impacts on AFNR, findings from earlier work, and general approaches. The last paragraph of the introduction should include the objectives or research questions for the study. Note – cite sources for statements that are NOT common knowledge.
3. **Literature Review** – The literature review should detail what information currently exists related to the research project. Information in this section should be written in APA format with in-text citations of related research to the project topic.
4. **Materials and Methods** – This section of the research paper is a narrative of the process used to replicate this research. Include all materials required to conduct the study in a narrative format. With field or lab work, describe the study site or processes conducted. Include any statistical procedures and software used.
5. **Results** – This section is a summary of the findings from the research. Tell the reader exactly what happened in a narrative while also including patterns and trends. Tables and figures are appropriate ways to highlight the data while referring to this information in the narrative. Data should not be added once the initial paper is written as this may change the discussion and conclusions.
6. **Discussion and Conclusions** - In this section, draw conclusions from the analysis of the results. Relate these analyses back to the objectives, hypotheses, or research questions. It is appropriate to explain the results in a narrative format. If the results were not expected, then explain why. Provide details about the results by elaborating on what happened in the research. If appropriate, tie the results back to the literature highlighted in the introduction and literature review sections of the paper. The discussion should refer to the tables and figures from the results section. The discussion and conclusion section should also address the impact of the research on AFNR and include potential challenges or bias in the research study.
7. **References** – Only published references should be included as references. These sources can be accessible through a library or other reputable source. All citations must have at least one accompanying in-text citation in the research paper. Remember, give credit if you are using others’ information. Use APA style recognized citation system throughout the research paper.
8. **Acknowledgement** – This section is a paragraph that includes acknowledging anyone who assisted with any aspect of the project and how they helped.
9. **Skill Development** – This section includes three competencies (five AFNR Standards from their primary pathway, two AFNR Standards from any pathway, and three AFNR Standards from Career Ready Practice (CRP) and/or Cluster Skills (CS).

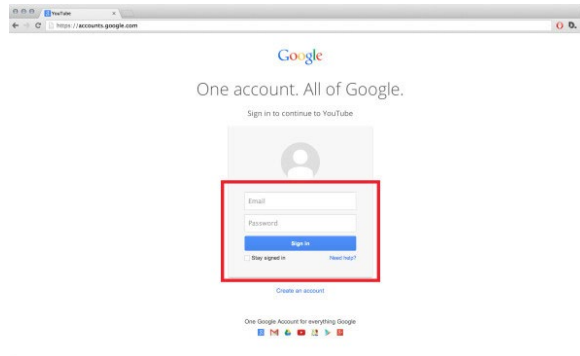
Video Presentation Grading Criteria

Area	High 20-15 points per section	Medium 14-9 points	Low 8-0 points	Points Earned
Introduction	Introduction answers the question “Why was the work done?” The presenter clearly states the problem that justifies conducting the research, the purpose of the research, its impact on AFNR, and the findings of earlier work and the general approach and objectives.	Introduction answers the question “Why was the work done?” The presenter vaguely states the problem that justifies conducting the research, the purpose of the research, its impact on AFNR, and the findings of earlier work and the general approach and objectives.	Introduction does not answer the question “Why was the work done?” The presenter does not state the problem that justifies conducting the research, the purpose of the research, its impact on AFNR, and the findings of earlier work and the general approach and objectives.	
Background Literature	The literature details what information currently exists concerning the research project. The information includes material cited such as articles about similar studies, similar research methods, history of the research area, and other appropriate information that supports the basis for the topic.	The literature details poorly what information currently exists concerning the research project. The information may not include material cited such as articles about similar studies, similar research methods, history of the research area, and other appropriate information that supports the basis for the topic	The literature does not detail what information currently exists concerning the research project. The information does not include material cited such as articles about similar studies, similar research methods, history of the research area, and other appropriate information that supports the basis for the topic	
Materials and Methods	Clearly presented to enable others to replicate the study and results. Encompasses all materials required, states the hypothesis/research questions and explains the study design. If used, statistical procedures are included.	Note clearly presented to enable others to replicate the study and results. May not encompass all materials required, states the hypothesis/research questions and explains the study design. If used, statistical procedures are included.	Poorly presented so others cannot replicate the study and results. Does not have materials required, states the hypothesis/research questions and explains the study design. If used, statistical procedures are included.	
Results	Results of the project are summarized. Trends and relationships are clearly addressed. Data can be in the form of tables or figures.	Results of the project are incomplete. Trends and relationships are not clearly addressed. Data can be in the form of tables or figures.	Results of the project are not summarized. Trends and relationships are not provided.	
Discussion and Conclusions	Brief summary of results included and shows relationships to the foundation of the study. Incorporates previous literature and relates to hypothesis/research questions. Provides recommendations for future research and impact on AFNR industry.	Brief summary of results included and unclear relationships to the foundation of the study. Incorporates limited previous literature and limitedly related to hypothesis/research questions. Provides few recommendations for future research and impact on AFNR industry.	No summary of results included and unclear relationships to the foundation of the study. Incorporates no previous literature and does not relate to hypothesis/research questions. Provides few recommendations for future research and impact on AFNR industry.	
Presentation Quality	Presentation is unique with appropriate information.	Presentation lacks unique approach with limited appropriate information.	Little to no presentation provided and lacks any creativity.	
Clarity of Presenter	Presenter(s) clearly explains the above required components of the presentation.	Presenter(s) lacks a clear explains the above required components of the presentation.	Presenter(s) does not explain the above required components of the presentation.	
		120 TOTAL POINTS	Final Presentation Total Points	

Arthur Berkey AFNR Science Fair YouTube Video Uploading Procedures

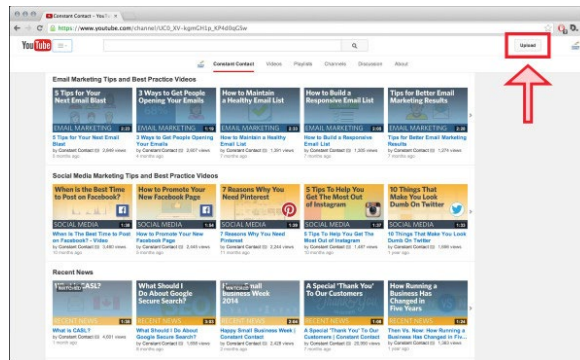
Getting Started

The first thing you will want to do is to log in to YouTube. To do this, you'll need to set up a Google account if you do not already have one. Your Google account can be used for YouTube, Google+, Gmail, and any other YouTube platforms.



Choosing a File

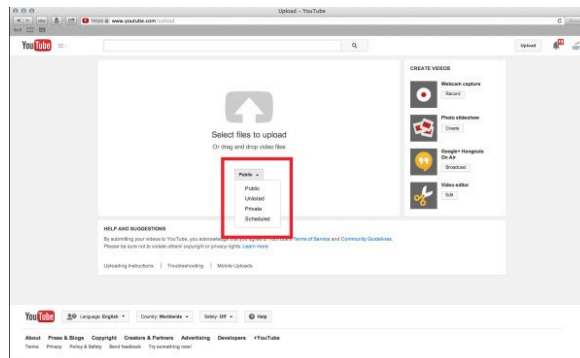
After logging in to YouTube, choose the "Upload" button near the upper right hand corner of the page. From there you will be taken to the Upload page.



Privacy Settings

Different types of videos should have different types of privacy on your YouTube channel.

It's important to set the privacy before uploading videos you do not want available to the public or visible on your channel. *For the purposes of the AFNR Science Fair, your video must be set to Unlisted.*

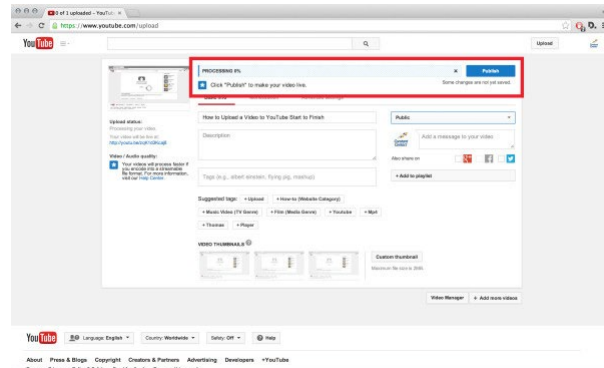


Once you choose your privacy, click the big arrow button and select the video you want to upload from your files, or simply drag and drop the file.

Uploading

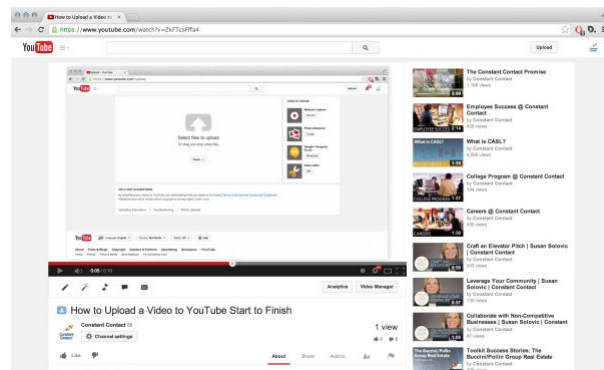
While the video uploads to your channel, you can see its progress on a status bar. Once uploaded, the video then has to process. You can see the progress for that in the status bar as well.

At this time, you will have the opportunity to name your video. Please name it with your last name and AFNR Program. For example: “Smith_Lansing”



Your Video's Page on YouTube

Now that you have uploaded your video, you can go to its dedicated YouTube page. When you submit your submission for the science fair, you must include the link your this video.



Arthur Berkey AFNR Science Fair Resources

Below are some poster creation resources that may be helpful to the process.

Making a better research poster

https://www.youtube.com/watch/AwMFhyH7_5g

Creating an academic poster using Powerpoint https://www.youtube.com/watch?v=_WnhoIbfcoM

How to make a scientific poster using Microsoft Powerpoint

<https://www.youtube.com/watch?v=9lOtOIKR9n4>

How to create a research poster

<https://guides.nyu.edu/posters>

Creating a research poster in Powerpoint

<https://www.brown.edu/academics/medical/sites/brown.edu.academics.medical/files/uploads/Instructions%20for%20Creating%20a%20Poster%20in%20PowerPoint.pdf>