

**Middle School  
Morgan County  
Science Fair**



# WV Science and Engineering Fair Elementary and Middle School Categories

The twelve categories (Animal Science, Plant Science, Behavioral and Social Science, Medical Science, Chemistry, Physics and Astronomy, Engineering, Material Science, Math and Data, Earth and Environmental Science, Energy Science, and Technology) have been established with the goal of aligning judges and student projects. The twelve categories, underlined and in red, are based on the ISEF categories, which are shown in black for informational purposes. Visit the ISEF website at <http://bit.ly/ISEFcat> for a complete description of the ISEF categories.

## ANIMAL SCIENCE

which includes:

### ANIMAL SCIENCES (ANIM)

- Animal Behavior
- Cellular Studies
- Development
- Ecology
- Genetics
- Nutrition & Growth
- Physiology
- Systematics & Evolution

### CELLULAR & MOLECULAR BIOLOGY (CELL)

- Cell Physiology
- Cellular Immunology
- Genetics
- Molecular Biology

### COMPUTATIONAL BIOLOGY & BIOINFORMATICS (CBIO)

- Computational Biomodeling
- Computational Epidemiology
- Computational Evolutionary Biology
- Computational Neuroscience
- Computational Pharmacology
- Genomics
- Neurobiology

## PLANT SCIENCE

which includes:

### PLANT SCIENCES (PLNT)

- Agriculture & Agronomy
- Ecology
- Genetics/Breeding
- Growth & Development
- Pathology
- Plant Physiology
- Systematics & Evolution

### CELLULAR & MOLECULAR BIOLOGY (CELL)

- Cell Physiology
- Cellular Immunology
- Genetics
- Molecular Biology

## BEHAVIORAL AND SOCIAL SCIENCE

which includes:

### BEHAVIORAL & SOCIAL SCIENCES (BEHA)

- Clinical & Developmental Psychology
- Cognitive Psychology
- Neuroscience
- Physiological Psychology
- Sociology & Social Psychology

## MEDICAL SCIENCES

which includes:

### BIOMEDICAL & HEALTH SCI (BMED)

- Cell, Organ, & Systems Physiology
- Genetics & Molecular Biology of Disease
- Immunology
- Nutrition & Natural Products
- Pathophysiology

### TRANSLATIONAL MED SCI (TMED)

- Disease Detection & Diagnosis
- Disease Prevention
- Disease Treatment & Therapies
- Drug Identification & Testing
- Pre-Clinical Studies

## PHYSICS AND ASTRONOMY

which includes:

### PHYSICS & ASTRONOMY (PHYS)

- Astronomy & Cosmology
- Atomic, Molecular, & Optical Physics
- Biological Physics
- Condensed Matter & Materials
- Mechanics
- Nuclear & Particle Physics
- Theoretical, Computational & Quantum Physics

## CHEMISTRY

which includes:

### CHEMISTRY (CHEM)

- Analytical Chemistry
- Computational Chemistry
- Environmental Chemistry
- Inorganic Chemistry
- Materials Chemistry
- Organic Chemistry
- Physical Chemistry

### BIOCHEMISTRY (BCHM)

- Analytical Biochemistry
- General Biochemistry
- Medical Biochemistry
- Structural Biochemistry

## ENGINEERING

which includes:

### BIOMEDICAL ENG. (ENBM)

- Biomaterials & Regen Medicine
- Biomechanics
- Biomedical Devices
- Biomedical Imaging
- Cell & Tissue Engineering
- Synthetic Biology

### MECHANICS ENG. (ENMC)

- Aerospace & Aeronautical Engineering
- Civil Engineering
- Computational Mechanics
- Control Theory
- Ground Vehicle Systems
- Industrial Engineering- Processing
- Mechanical Engineering
- Naval Systems

### ENVIRONMENTAL ENG. (ENEV)

- Bioremediation
- Land & Reclamation
- Pollution Control
- Recycling & Waste Management
- Water Resources Management

## MATERIAL SCIENCE

which includes:

### MATERIALS SCIENCE (MATS)

- Biomaterials
- Ceramic & Glasses
- Composite Materials
- Computation & Theory
- Electronic, Optical & Magnetic Materials
- Nanomaterials
- Polymers

## MATH AND DATA

which includes:

### MATHEMATICS (MATH)

- Analysis
- Combinatorics, Graph Theory, & Game Theory
- Geometry & Topology
- Number Theory
- Probability & Statistics

## EARTH AND ENVIRONMENTAL SCIENCE

which includes:

### EARTH & ENVIRONMENTAL SCIENCES (EAEV)

- Atmospheric Science
- Climate Science
- Environmental Effects on Ecosystems
- Geosciences
- Water Science

## ENERGY

which includes:

### CHEMICAL (EGCH)

- Alternative Fuels
- Computational Energy Science
- Fossil Fuel Energy
- Fuel Cells & Battery Develop
- Microbial Fuel Cells
- Solar Materials Other

### PHYSICAL (EGPH)

- Hydro Power
- Nuclear Power Solar
- Sustainable Design
- Thermal Power
- Wind

## TECHNOLOGY

which includes:

### ROBOTICS & INTELLIGENT MACHINES (ROBO)

- Biomechanics
- Cognitive Systems
- Control Theory
- Machine Learning
- Robot Kinematics

### SYSTEMS SOFTWARE (SOFT)

- Algorithms
- Cybersecurity
- Databases
- Human/Machine Interface
- Languages & Operating Systems
- Mobile Apps
- Online Learning

### EMBEDDED SYSTEMS (EBED)

- Circuits
- Internet of Things
- Microcontrollers
- Networking & Data
- Communications
- Optics
- Sensors
- Signal Processing

APPLICATION FOR ENTRY OF SCIENTIFIC EXHIBIT

MORGAN COUNTY SCIENCE FAIR

Student's Name: \_\_\_\_\_

Title of Project: \_\_\_\_\_

Categories (Check One): (All Elementary, Middle, & High categories are listed. Make sure you check the right category for the right age group.)

- |                                                                     |                                                              |
|---------------------------------------------------------------------|--------------------------------------------------------------|
| <input type="checkbox"/> 1. Animal Sciences                         | <input type="checkbox"/> 13. Environmental Engineering       |
| <input type="checkbox"/> 2. Behavioral & Social Sciences            | <input type="checkbox"/> 14. Material Science                |
| <input type="checkbox"/> 3. Biochemistry                            | <input type="checkbox"/> 15. Mathematics                     |
| <input type="checkbox"/> 4. Biomedical & Health Sciences            | <input type="checkbox"/> 16. Math & Data                     |
| <input type="checkbox"/> 5. Biomedical Engineering                  | <input type="checkbox"/> 17. Medical Sciences                |
| <input type="checkbox"/> 6. Cell & Molecular Biology                | <input type="checkbox"/> 18. Microbiology                    |
| <input type="checkbox"/> 7. Chemistry                               | <input type="checkbox"/> 19. Physics & Astronomy             |
| <input type="checkbox"/> 8. Computational Biology & Bioinformatics  | <input type="checkbox"/> 20. Plant Sciences                  |
| <input type="checkbox"/> 9. Earth Sciences & Environmental Sciences | <input type="checkbox"/> 21. Robotics & Intelligent Machines |
| <input type="checkbox"/> 10. Embedded Systems                       | <input type="checkbox"/> 22. Systems Software                |
| <input type="checkbox"/> 11. Energy                                 | <input type="checkbox"/> 23. Technology & Systems            |
| <input type="checkbox"/> 12. Engineering                            | <input type="checkbox"/> 24. Translational Medical Sciences  |

**NOTE: Teams will be integrated into 1-24 categories.**

**PLEASE ANSWER THE FOLLOWING QUESTIONS:**

1. Have you reviewed the display and safety regulations required by ISEF rules? Yes or No
2. Are all the following forms attached to this application?

<u>Elementary</u>	<u>Middle</u>	<u>High</u>
<input type="checkbox"/> Rules & Media Agreement	<input type="checkbox"/> Rules & Media Agreement	<input type="checkbox"/> Rules & Media Agreement
<input type="checkbox"/> Permission & Safety Form	<input type="checkbox"/> Research Plan	<input type="checkbox"/> Abstract
<input type="checkbox"/> Abstract	<input type="checkbox"/> Permission & Safety Form	<input type="checkbox"/> Adult Sponsor Checklist (1)
	<input type="checkbox"/> Abstract	<input type="checkbox"/> Student Checklist (1A)
		<input type="checkbox"/> Research Plan/Project Summary (1A2)
		<input type="checkbox"/> Approval Form (1B)
3. Is your project larger than 76 cm deep, 122 cm wide, or 274 cm high including the table? This is the maximum size! Yes or No
4. Does your display use photographs? Yes or No
  - a. If yes, no photographs of animals in other than normal conditions; no dissection photographs nor laboratory techniques can be shown; no faces of individuals.
5. Does your display require an electrical supply? Yes or No
  - a. If yes, you must supply your own grounded extension cord (minimum of 9 feet).

**PARENT/GUARDIAN SIGNATURE FOR THE PUBLICATION OF STUDENT WORK/PICTURES**

**PLEASE CHECK and SIGN BELOW**

- My child's science fair project and photographs of my child may be published on the Internet and/or school/local publications.
- My child's science fair project and photographs of my child may not be published.

**Certification**

I hereby apply for space at the Morgan County Schools Science Fair with the full intention of entering an exhibit. I agree to abide by the display and safety rules and regulations, which I have read. I certify that the project is essentially my own work.

\_\_\_\_\_  
Student's Signature

I certify that to the best of my knowledge, this project was essentially the work of the student named above, and I give my approval for it to be entered in the Science Fair Competition.

\_\_\_\_\_  
Parent/Guardian Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Teacher Signature

# WVSEF RULES AND REGULATIONS 2023-24

Last updated: August 14, 2023

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## Levels of Authority (rules 1-4)

1. The fair coordinator (school, county, regional, or state) has the final decision on matters pertaining to the fair if these matters are not covered in fair regulations.
2. Disqualification of projects not meeting the project rules is the responsibility of the fair coordinator(s).
3. Any challenge at the school, county, regional, and/or state level must be submitted within one business day following the fair. Once the official results have been finalized on fair day, the fair director will only modify or overrule a judge's decision in the event of an obvious mathematical error in the scoring process.
4. The fair coordinator at each level of competition (school, county, regional, state) has sole and final authority to resolve issues, concerns, conflicts, or disputes at that level of competition. State fair coordinators will not intervene in matters related to school, county, or regional fairs. For example, a county fair coordinator may not intervene in a dispute at a regional level fair. The final authority lies with the regional fair coordinator in that instance.

## General Rules (rules 5-13)

5. Each project must include a physical display, oral presentation, and written abstract (in the approved format). A project that does not include all three required components shall be disqualified from the competition.
6. Projects that are demonstrations, 'library' research, informational projects, or 'explanation' models are not recommended or appropriate for WVSEF. Projects should be experimental or engineering projects.
7. Student, school, or county names must not appear on any part of the project other than on the required forms.

8. Students may ask others for help and direction, but they must do all the work themselves.
9. Projects may be done as an individual or in a small group of no more than three members. A student may enter only ONE project. For example, a student participating in a small group project may not enter a second project in the fair as an individual or a member of another small group.
10. Once a project competes as a group project at any level of competition, it must be entered as a group project in all subsequent levels of competition, even if other group members withdraw. **Group projects must have no more than 3 members.** Members of the group may not be changed or added to if a member is unable to attend a competition.
11. Projects may be modified or improved between each level of competition; however, the theme must be maintained.
12. Individuals and groups/teams in the same categories and at the same programmatic levels (elementary, middle school, and high school) compete against each other.
13. Each project must represent the unique work of the student(s) who develop it. The fair director may disqualify a project if it is determined that the student(s) duplicated another student's work (i.e., two projects from the same school or county are nearly identical), committed plagiarism, or engaged in other egregious violations of generally accepted academic integrity standards.

## Registration (rules 14-19)

14. The school or county fair coordinator will determine the registration process for school and county fairs.
15. County fair coordinators are responsible for registering projects for regional fairs using the WV State Science and Engineering Fair Online Registration System linked at <https://wvde.us/wvsef/>. Use of this system is mandatory. Detailed information on the Online Registration System will be provided to county and regional fair coordinators.
16. Regional fair coordinators are responsible for registering projects for the State Science and Engineering Fair using the WV State Science and Engineering Fair Online Registration System linked at <https://wvde.us/wvsef/>. Use of this system is mandatory. Detailed information on the Online Registration System will be provided to county and regional fair coordinators.
17. County coordinators are responsible for sending student paperwork to the WVDE after the regional winners are announced and prior to the WVDE deadline.
18. At the State Science and Engineering Fair, students are not required to register or check in on the day of the fair if they have checked the website and know their project number. Upon arrival, students may proceed directly to their assigned project numbers and assemble their projects. Project numbers will be posted to <https://wvde.us/wvsef/> at least one week before the fair date.
19. It is the responsibility of the fair coordinator (county or regional) to ensure the accuracy of registration information (student names, project titles, category selections, etc.) before submission.

## Levels of Competition (rules 20-22)

20. There will be four levels of competition: school, county, regional, and state.
21. Counties may send only their first-place winners in each Division and Category to the regional fair. Regions may send only their first-place winners in each Division and Category to the State Fair in

Charleston. Each region may also choose to send an additional 7 projects in Division III (grades 9-12) provided the projects have a score of 90 or above.

a. The first-place winner is the highest scoring project in the Division/Category, scoring 90 or above. A project must score a minimum of 90 out of 100 points to move on as a first-place winner to the next level of competition. If no project scores 90 points or better in a certain category, then no project from that category will move on to the next level of competition.

22. If the first-place project at a regional fair is unable to attend the state fair, a second-place project may be substituted if:

a. The substitution is made BEFORE the regional fair coordinator submits project information to the State Science and Engineering Fair; AND

b. The second-place project scored 90 or above at the regional fair.

c. No substitutions may be made after project information has been submitted to the state.

## **Project Classifications (rules 23-28)**

23. All projects are classified by the county coordinator at the time of the Regional Fair registration by division (grade level) and category (subject).

24. Divisions: Division I (Grades 3-5), Division II (Grades 6-8), and Division III (Grades 9-12).

25. Categories:

a. Elementary and middle school projects compete in one of the 12 categories of the WVSEF.

b. High School projects compete in one of 21 ISEF categories.

26. Each region may submit ONE first-place project in each division/category for competition at the state fair. Each region may also choose to send an additional 7 projects in Division III (grades 9-12) provided the projects have a score of 90 or above. These additional projects will need to be marked as first place winners in the WV State Science and Engineering Fair Online Registration System database linked at <https://wvde.us/wvsef/>.

27. Projects in a specific division/category will compete only against other projects of the same division/category. For example, a project classified as Division I, Animal Science will only compete against other Division I, Animal Science projects.

28. If a category classification is questioned, the school, county, regional, or state coordinator will make a final determination.

## **Project Displays (rules 29-35)**

29. Project displays may be a traditional physical display with artifacts and/or a multimedia presentation. Division III (grades 9-12) must use a physical display or poster. For additional Division III (grades 9-12) regulations, consult <https://www.societyforscience.org/isef/international-rules/>.

30. The display area must be no larger than 30 inches or 76 centimeters front to back, 48 inches or 122 centimeters wide, and 108 inches or 274 centimeters tall. No part of the physical or digital display may extend beyond the established size limitations. Any project exceeding the maximum established dimensions will be disqualified from the competition.

31. The display must be assembled on tables provided by the WV State Science and Engineering Fair. Students are NOT permitted to bring their own tables.

32. The space under the table directly beneath the project may be used for storage.

33. Items may hang from the front of the table (tablecloths, charts, etc.).
34. Display items may NOT be placed in the aisle, even during the oral presentation.
35. Items of value should not be left unattended with the project display. This includes computers, tablets, DVD players, MP3 players, digital photo frames, and any objects that might be easily pilfered. Such items should remain in the student's possession at all times. Judges will allow time for students to return these items to the project display immediately prior to the oral presentation.

### **Electronic Devices (rules 36-40)**

36. Electronic devices (personal laptops, tablets, DVD players, MP3 players, cell phones, digital cameras, handheld gaming equipment, or audio recorders) may be incorporated into the physical display and/or oral presentation. A digital display such as a laptop may be used exclusively as a physical display or presentation for Division I and Division II projects. Electronic devices should not be left with the project display. Such items should remain in the student's possession at all times.
37. Computers and other electronic devices must be provided by the student.
38. Sound may be played at the time of the oral presentation ONLY. Volume must be limited so it does not interfere with other students' presentations.
39. Electrical outlets will NOT be provided for project displays in Division I (grades 3-5) or Division II (grades 6-8). All electronic devices must be battery-operated. For Division III (grades 9-12) projects requesting electricity for demonstration purposes, access to electricity will be provided. Electricity will not be provided for display or decorative purposes.
40. An internet connection may be used as part of a project display ONLY if the student provides a means of connecting (laptop, air card, or phone with cellular connectivity). **At the State level of competition, use of the Charleston Coliseum and Convention Center's internet connection (wireless or wired) will not be authorized under any circumstance.**

### **Written Abstracts (rules 41-43)**

41. Each project must have a written abstract in the approved format (see abstract template). A physical copy of the abstract must remain in the display area at all times.
42. Abstracts must use the official state form or be typed and include the required information.
43. Abstracts must be self-explanatory.

### **Oral Presentation (rules 44 – 49)**

44. All projects will include an oral presentation. Participants should notify fair officials IMMEDIATELY if they are denied the opportunity to deliver their complete oral presentation.
45. Oral presentations for individual and group projects should be at least 5 minutes, but they may not exceed 10 minutes in length. The question-and-answer period is not included in the oral presentation time limit.
46. Each student participant in a small group project must have a speaking part in the oral presentation.
47. Each student should be prepared to respond to questions from judges.
48. If a member of the small group has an acceptable excuse for being unable to attend, the other members of the group may represent the project.

49. Oral presentations may not be pre-recorded or delivered virtually. Students must be in attendance at the fair to present their projects.

### **Judging and Awards (rules 50-61)**

50. Each project at the state-level competition will be assigned a judging time and project number. Project numbers will be posted on the State Science and Engineering Fair website at <https://wvde.us/wvsef> at least one week prior to the fair date. Judging times will NOT be provided prior to the fair date. Requests for time changes or for specific judging times will NOT be honored.
51. First-, second-, and third-place awards may be given to the three highest-scoring projects in each Division and Category that meet minimum score requirements. A project must score a minimum of 90 out of 100 points to be identified as a first-place winner, 80 or above to be identified as a second-place winner, and 70 or above to be identified as a third-place winner. Because of the minimum score requirements, it is possible for a category to have no winning projects.
52. Honorable mention awards may be granted upon the judges' recommendation and are not dependent upon the score. An honorable mention award is not considered a fourth-place award. Judges are not required to award an honorable mention.
53. Ties for first-, second-, or third-place awards are not permitted at the school, county, regional, or state level.
54. At the State Science and Engineering Fair, winning projects will be identified with a ribbon or sticker prior to the public viewing. Only those students whose projects are identified with a sticker or ribbon are required to remain for the awards ceremony. Students unable to attend the awards ceremony must identify someone to receive their award. Awards will NOT be mailed.
55. Access to the project display room is limited to fair officials, judges, and students during the scheduled judging period. Parents and teachers may not accompany students into the project display area during the scheduled judging period.
56. Projects may not be removed until after the public viewing. Students who are unable to retrieve their projects following the public viewing and awards ceremony must identify someone to do so. Anything left at the fair will be discarded at the conclusion of the event.
57. Projects that win first place at the state level will not be eligible to compete in school, county, regional, or state fairs in subsequent years.
58. Issues or concerns about the judging process, particularly those issues related to oral presentations, must be addressed with the fair coordinator immediately. It is often impossible to resolve such matters after a category has closed and judges have been dismissed.
59. At the state level, student copies of scorecards will be provided to county fair coordinators ONLY. State fair officials will not release scorecards directly to students or parents.
60. Due to potential conflicts, immediate relatives (parents, grandparents, siblings, guardians, etc.) and teachers of fair participants are not eligible to serve as judges. Failure to disclose such a conflict to fair officials may result in disqualification of the project and may disqualify the judge from participating in future events.
61. Judges are prohibited from taking photographs of student participants and may only take photographs of project displays when no students are present in the project room.

### **Nonpublic School and Homeschool Students (rules 62-65)**

62. Nonpublic school and homeschool students may participate in the State Science and Engineering Fair



- under the guidelines established in this section.
63. Homeschool students must contact the public school they would attend and participate beginning at the school level.
  64. Nonpublic school students may choose one of the following three options:
    - 1) Students may contact the local public school they would attend to participate beginning at the school level; or
    - 2) Nonpublic schools may host their own school fair and send one project (best of show) from each division, as defined in the Project Classifications section of the fair rules and regulations, directly to the regional fair; or
    - 3) Nonpublic schools may host their own school fair and send projects to the county fair at the discretion of the county fair coordinator who determines local participation rules.
  65. The Nonpublic school cannot send projects directly to the regional fair and projects to the county fair. Nonpublic schools must choose between regional or county competition. Only one option is permitted. If the nonpublic school hosts a school fair, the school fair must comply with all rules and regulations established for the West Virginia State Science and Engineering Fair.

## Safety Considerations and Prohibited Items (rules 66-70)

66. **The following are prohibited at all levels of competition (school, county, regional, and state).** Note: In the case in which a Finalist's Project includes an item that is prohibited from display, please consider taking photographs and/or documenting the significance of the prohibited item through video.
  - a. Living organisms, including plants
  - b. Glass
  - c. Soil, sand, rock, cement and/or waste samples, even if permanently encased in a slab of acrylic
  - d. Taxidermy specimens or parts
  - e. Preserved vertebrate or invertebrate animals
  - f. Human or animal food
  - g. Human/animal parts or body fluids (for example, blood, urine)
  - h. Plant materials (living, dead, or preserved) that are in their raw, unprocessed, or non-manufactured state
  - i. **All chemicals including water. Absolutely no liquids can be utilized in the Project Display.**
  - j. All hazardous substances or devices (Example: poisons, drugs, firearms, weapons, ammunition, reloading devices, grease/oil and sublimating solids such as dry ice)
  - k. Items that may have contained or been in contact with hazardous chemicals (Exception: Item may be permitted if professionally cleaned and documentation for such cleaning is available). Filters (including microbial) may not be displayed unless the Display & Safety Committee can reasonably determine that the device was cleaned or was never used (please include receipts in your notebooks and/or logbooks)
  - l. Sharp items (for example, syringes, needles, pipettes, knives)
  - m. Flames and highly flammable materials
  - n. Batteries with open-top cells or wet cells
  - o. Drones or any flight-capable apparatus unless the propulsion power source removed
  - p. 3D Printers unless the power source is removed
  - q. Inadequately insulated apparatus capable of producing dangerous temperatures are not permitted
  - r. Any apparatus with belts, pulleys, chains, or moving parts with tension or pinch points that are not appropriately shielded
  - s. Any display items that are deemed distracting (i.e. sounds, lights, odors, etc.)
  - t. Class IV Lasers (All use of lower-class lasers must be under direct supervision of a qualified adult)
  - u. Any apparatus or project material deemed unsafe by the Scientific Review Committee, the Display & Safety Committee, or the Society Electrical Regulations
  - v. Any item prohibited by county or WV Board of Education Policies; and
  - w. Any item that the fair coordinator deems unsafe or inappropriate for public display.
67. **Laser/Laser Pointer Regulations** Any Class 1, Class 2, Class 3A, or Class 3R lasers are allowed to be used under adult supervision. No other lasers may be used or displayed.
  - a. Laser beams may not pass through magnifying optics such as microscopes and telescopes.
  - b. Lasers must be labeled by the manufacturer so that power output can be inspected. Lasers without labels will NOT be permitted.

- c. Handheld lasers are NOT permitted.
  - d. Lasers will be confiscated with no warning if not used in a safe manner.
68. The following are **PROHIBITED in all Elementary School (grades 3-5) Science Fair Projects** with NO exceptions:
- a. Biological Agents projects that use or study microorganisms, including mold, bacteria, viruses, prions, fungi, and parasites, including those grown in Petri dishes.
69. The following are **PROHIBITED in Elementary and Middle School (grades 3-8) Science Fair Projects** with NO exceptions:
- a. Vertebrate Animal Research involving pain, withholding of food or water. *All Vertebrate Animal Research should be reviewed by a Doctor of Veterinary Medicine and a school-based Institutional Review Board (IRB)/Scientific Review Committee (SRC).*
  - b. Hazardous chemicals or reagents, DEA-controlled substances, tobacco, alcohol, prescription drugs, firearms, or explosives.
  - c. Biological Agents experiments done at home that use or study microorganisms, including bacteria, viruses, prions, fungi, and parasites.
  - d. Radioactive substances or equipment that emits any form of ionizing radiation.
70. The following types of research are **discouraged in Middle School** but can be permitted with advanced permission. Students must have their projects approved by the school administrator **BEFORE** starting their research (check if a project requires pre-approval)!
- a. Middle school level students (Grades 6 - 8) are **DISCOURAGED** from conducting research using biological materials (bacteria, DNA, fungi, molds, etc.) where the materials must be grown or cultured.
  - b. Human Subjects may be used only if all experimentation is conducted under adult supervision and student researchers have notified parents of the conditions of the experiment and provided the opportunities for subjects to opt out of participation. All participants must sign an informed consent form. All guidelines for human participant research must be followed and forms submitted to the student's teacher and administrator **BEFORE** experimentation begins.
    - i. Human Research must be reviewed by a medical professional prior to experimentation to ensure the safety of the student and participants.
    - ii. Animal Behavior Studies Research projects should be reviewed by a veterinarian prior to experimentation to ensure the safety of the student and animal. All vertebrate animal studies **MUST** be of an observational nature and not be done with any animals other than privately owned animals.
    - iii. If you wish to do an animal research project, please use invertebrates!

# WV Science and Engineering Fair

## Steps to a Successful Project

The purpose of this guide is to provide information on how to complete a science fair project. Ideas are given on how to choose, develop, and display a project and how to prepare for judging. Although a lot of hard work goes into preparing a project, remember that the purpose of a project, which reflects you and your interests, is to provide you with an enjoyable learning experience, so above all, enjoy working and doing science because SCIENCE IS FUN!

### Steps to a successful project:

1. Understand the information in this guide and the fair rules: Before you start your project, familiarize yourself with the science fair rules, along with these suggestions.
2. Ask your teacher to explain anything you do not understand.
3. Pick your topic: Get an idea of what you want to explore! Choose a topic for your project that deals with an area of science that interests you. You can find ideas in books, magazines, textbooks etc. List the categories or ideas that you have selected and pick a specific topic.
4. Research your topic: Go to the library or internet and learn everything you can about your topic. Look for the unexplained or unexpected. Talk to professionals in the fields that you are interested in or email companies. Take notes on what you learn and keep track of the sources you use with a bibliography.
5. Organize: Organize everything you have learned about your topic. Next, create a question and hypothesis based on the information you have learned.
6. Plan your experiment: Once you have a project idea you must design an experiment. Next create a plan in which you list all the materials and steps in your experiment. Design an experiment that can be done in the amount of time that you have. Discuss this with your teacher to make sure that you are on the right track.
7. Complete your "paperwork": Use a calendar to identify important dates. Leave time to fill out your forms and review with your teacher.
8. Conduct your experiment and take photographs: During experimentation take detailed notes on what you see and do. Keep a research journal, including dates and times as needed. Take photographs, not including faces, of your experiment and the results. Make sure to change only one variable at a time in your experiment and start with a control experiment where nothing is changed. Make sure you include at least 5 or more test subjects in the control and experimental groups. Note any changes you made in your results.
9. Examine your results: When you complete your experiments, examine and record your findings. Use a chart, graph, table, etc. to record your results. Did your experiment go as you planned? Why or why not? Was your experiment performed with the exact same steps each time? Remember, gaining the understanding of unusual or unexpected results is not a scientific failure, but an important lesson to learn.
10. Draw conclusions: Answer the following conclusions: Which variables are important? Did you collect enough data? Do you need to conduct more experimentation? Did the results support your hypothesis? If your results did not, what happened? Remember an experiment is done to prove or disprove a hypothesis.

11. Prepare a report (optional for elementary and middle school, required for high school): Prepare a report on what you learned and how you learned it. First start with a rough draft, going into as much detail as possible so another person could repeat your experiment. A good report will include 1) a title, 2) acknowledgments of who helped, 3) an introduction of your topic, 4) discussion of your problem, 5) list of all materials, 6) your step-by-step procedure, 7) observation and results, 8) conclusions, and 9) bibliography.
12. Design your display: Now that your research and scientific report is done, you must now create a display to show what you have done. Neatness, clarity, and organization are keys to a successful display. Check spelling, punctuation, grammar, and the accuracy of your information. Your display may include whatever objects that are not excluded by the rules. Your display should include title, question, hypothesis, report, list of materials, procedure, observations, conclusions, and abstract. Refer to the rules for a list of items that may NOT be included in your display.
13. Write your abstract (required): Using the required form, write an abstract. Include a clean copy of the abstract with your display. You will also need to submit your abstract when your project passes from the school to county to regional to state fairs.
14. Prepare for judging: Your project will be judged using a point system based on your science, your display, and your oral presentation. The oral presentation is an important part of the judging process. During your presentation, you should discuss:
  - why you chose your topic,
  - how you gathered your information,
  - how you tested your hypothesis,
  - what observations you made,
  - and what conclusions you reached.
15. You may want to write note cards or refer to parts of your display to plan what you are going to talk about. Rehearse what you are going to say, DO NOT READ your presentation. The presentation should only take 3-5 minutes. Practice in front of your family and friends. Keep in mind the judges are looking for a student who has learned from their research and experiment. Although it is natural to be a little nervous about presenting, remember that the judges are not there to trick or embarrass you. They are interested in you and what your project is all about, so be pleasant, courteous and enjoy yourself. Above all, show them that you are proud of what you have accomplished!

# WV Science and Engineering Fair Science Score Card

## Project Information

Project Title		
Category		
Division	Project Number	

## Judging Criteria for Science Projects

### Science Research and Methodology (65 points)

	Comments	Score
<b>Research Question (10 points)</b> <ul style="list-style-type: none"> <li>• Clear and focused purpose</li> <li>• Identifies contribution to the field of study</li> <li>• Testable using scientific methods</li> </ul>		
<b>Design and Methodology (15 points)</b> <ul style="list-style-type: none"> <li>• Well-designed plan and data collection methods</li> <li>• Variables and controls defined, appropriate and complete</li> </ul>		
<b>Execution: Data Collection, Analysis, and Interpretation (20 points)</b> <ul style="list-style-type: none"> <li>• Systematic data collection and analysis</li> <li>• Reproducibility of results</li> <li>• Appropriate application of mathematical and statistical methods</li> <li>• Sufficient data collected to support interpretation and conclusions</li> </ul>		
<b>Creativity (20 points)</b> <ul style="list-style-type: none"> <li>• Project demonstrates imagination and inventiveness. Such projects often offer different perspectives that open new possibilities or new alternatives. Judges should place emphasis on research outcomes in evaluating creativity.</li> </ul>		

### Presentation (35 points)

<b>Poster, or Visual Display (10 points)</b> <ul style="list-style-type: none"> <li>• Logical organization of material</li> <li>• Clarity of graphics and legends</li> <li>• Supporting documentation displayed</li> </ul>		
<b>Interview (25 points)</b> <ul style="list-style-type: none"> <li>• Clear, concise, thoughtful responses to questions</li> <li>• Understanding of basic science relevant to the project</li> <li>• Understanding interpretation and limitations of results and conclusions</li> <li>• Degree of independence in conducting the project</li> <li>• Recognition of potential impact in science, society and/or economics</li> <li>• Quality of ideas for further research</li> <li>• For team projects, contributions to and understanding of the project by all members</li> </ul>		

**Total Score**

Additional Comments / Suggestions (continue on back if needed):

Place awarded (circle)	First (minimum score 90)	Second (minimum score 80)	Third (minimum score 70)	Honorable Mention
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# WV Science and Engineering Fair Engineering Score Card

## Project Information

Project Title			
Category			
Division	Project Number		

## Judging Criteria for Engineering Projects

### Research and Methodology (65 points)

	Comments	Score
<b>Research Problem (10 points)</b> <ul style="list-style-type: none"> <li>Description of a practical need or problem to be solved</li> <li>Definition of criteria for the proposed solution</li> <li>Explanation of constraints</li> </ul>		
<b>Design and Methodology (15 points)</b> <ul style="list-style-type: none"> <li>Exploration of alternatives to answer needs or problem</li> <li>Identification of a solution</li> <li>Development of a prototype/model</li> </ul>		
<b>Execution: Data Collection, Analysis, and Interpretation (20 points)</b> <ul style="list-style-type: none"> <li>Prototype demonstrates intended design</li> <li>Prototype has been tested in multiple conditions/trials</li> <li>Prototype demonstrates engineering skill and completeness</li> </ul>		
<b>Creativity (20 points)</b> <ul style="list-style-type: none"> <li>Project demonstrates significant creativity</li> <li>Creative project demonstrates imagination and inventiveness. Such projects often offer different perspectives that open new possibilities or new alternatives. Judges should emphasize research outcomes in evaluating creativity.</li> </ul>		

### Presentation (35 points)

<b>Poster or Visual Display (10 points)</b> <ul style="list-style-type: none"> <li>Logical organization of material</li> <li>Clarity of graphics and legends</li> <li>Supporting documentation displayed</li> </ul>	Comments	Score
<b>Interview (25 points)</b> <ul style="list-style-type: none"> <li>Clear, concise, thoughtful responses to questions</li> <li>Understanding of basic science relevant to the project</li> <li>Understanding interpretation and limitations of results and conclusions</li> <li>Degree of independence in conducting a project</li> <li>Recognition of potential impact in science, society, and/or economics</li> <li>Quality of ideas for further research</li> <li>For team projects, contributions to and understanding of the project by all members</li> </ul>	Comments	Score

	<b>Total Score</b>	
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Additional Comments / Suggestions (continue on back if needed):

Place awarded (circle)	First (minimum score 90)	Second (minimum score 80)	Third (minimum score 70)	Honorable Mention
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# WV Science and Engineering Fair

## Elementary/Middle Student Rules, Safety, and Media Permission

Instructions: Complete 1 per project and submit to WVDE.

### Project Information

Project Title	
Category	
County / School	

### Team Member Information

I have read and followed all rules set forth in the WV State Science and Engineering Fair Guidance at [WVSEF - WVDE](#).

Student 1 Name	Student Signature	
Parent Email	Grade	

### Team Member Information

I have read and followed all rules set forth in the WV State Science and Engineering Fair Guidance at [WVSEF - WVDE](#).

Student 2 Name	Student Signature	
Parent Email	Grade	

### Team Member Information

I have read and followed all rules set forth in the WV State Science and Engineering Fair Guidance at [WVSEF - WVDE](#).

Student 3 Name	Student Signature	
Parent Email	Grade	

### Teacher Information

To be completed BEFORE experimentation. As the adult sponsor, I attest that I have carefully studied and approved the student's research plan, including safety considerations. I attest that I have reviewed each student's county/school media release, and all students' images may be used by the WVDE for recognition and marketing purposes.

Teacher Sponsor Email	Teacher Signature	
	Date	

### School Administrator

Admin Name	Admin Signature	
Email	Date	

# WV Science and Engineering Fair Middle School Research Plan

Instructions: Complete 1 per project BEFORE EXPERIMENTATION and bring it to the fair.

## Project Information

Project Title	
Category	
County	
School	

Please answer the questions below:

Question being addressed:

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Hypothesis / Problem / Engineering Goals:

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Description of procedure and data analysis:

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Bibliography. List at least five (5) references:

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# WV Science and Engineering Fair Middle School Abstract

Instructions: Complete 1 per project and bring it to the fair.

## Project Information

Project Title	
Category	
County	
School	

Please answer the questions below:

This abstract describes only procedures performed by me/us, reflects my/our independent research, and represents one year's work.	Yes	No		
I/we worked or used equipment in a regulated research institution or industrial setting.	Yes	No		
This project is a continuation of previous research.	Yes	No		
My display board includes non-published photographs/visual depictions of humans (other than myself).	Yes	No		
I/we certify that the abstract and responses to the above statements are correct and adequately reflect my/our work.	Yes	No		
As a part of this research project, the student directly handled, manipulated, or interacted with (check ALL that apply):				
_____ human subjects		_____ microorganisms		
_____ vertebrate animals		_____ rDNA		
_____ potentially hazardous biological agents		_____ tissue		

## Abstract



## WV Science and Engineering Fair

If you are using Animals or Humans in your Project, there are additional Forms that must be completed.

You can find those Forms at:

<https://wvde.us/wvsef/students/>

Or

1). Vertebrate and Human Research Form

<https://wvde.us/wp-content/uploads/2022/08/Elementary-and-Middle-Vertebrate-and-Human-Research-Form.pdf>

2). Elementary/Middle Human Informed Consent Form

<https://wvde.us/wp-content/uploads/2022/08/Elementary-Middle-Human-Informed-Consent-Form.pdf>

If you have any other questions, please reach out to your child's school and science teacher.



**Morgan County Schools  
County-Level Science Fair**

Saturday, January 6, 2024,  
(Snow Date: Saturday, January 20, 2024)

Berkeley Springs High School

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**Set-up of Displays: Saturday, January 6, 2024, 8:00 a.m. to 9:00 a.m.**

**Fair Schedule**

Registration/Set-Up of Displays	8:00-9:00 am	Hallway/Cafeteria
Greetings and Announcements	9:00-9:15 am	Auditorium
Judging	9:00 am-11:30/12:00 pm	Cafeteria
Science Activities	9:15 am-11:30/12:00 pm	Classroom
Public Viewing of Projects	11:30/12:00-12:15 pm	Cafeteria
Awards Ceremony	12:15-1:00 pm	Auditorium

All parents and students need to be seated in the auditorium by 9:00 a.m. for the greeting and announcements.

All students, grades 4-8, will participate in a science activity while waiting to be judged.

**Upcoming Dates for Eligible Students!**  
**Eastern Panhandle Regional Elementary & Middle**  
**School Science Fair**  
Date: February 2, 2024  
(Snow Date: February 9, 2024)  
Location Ranson Civic Center