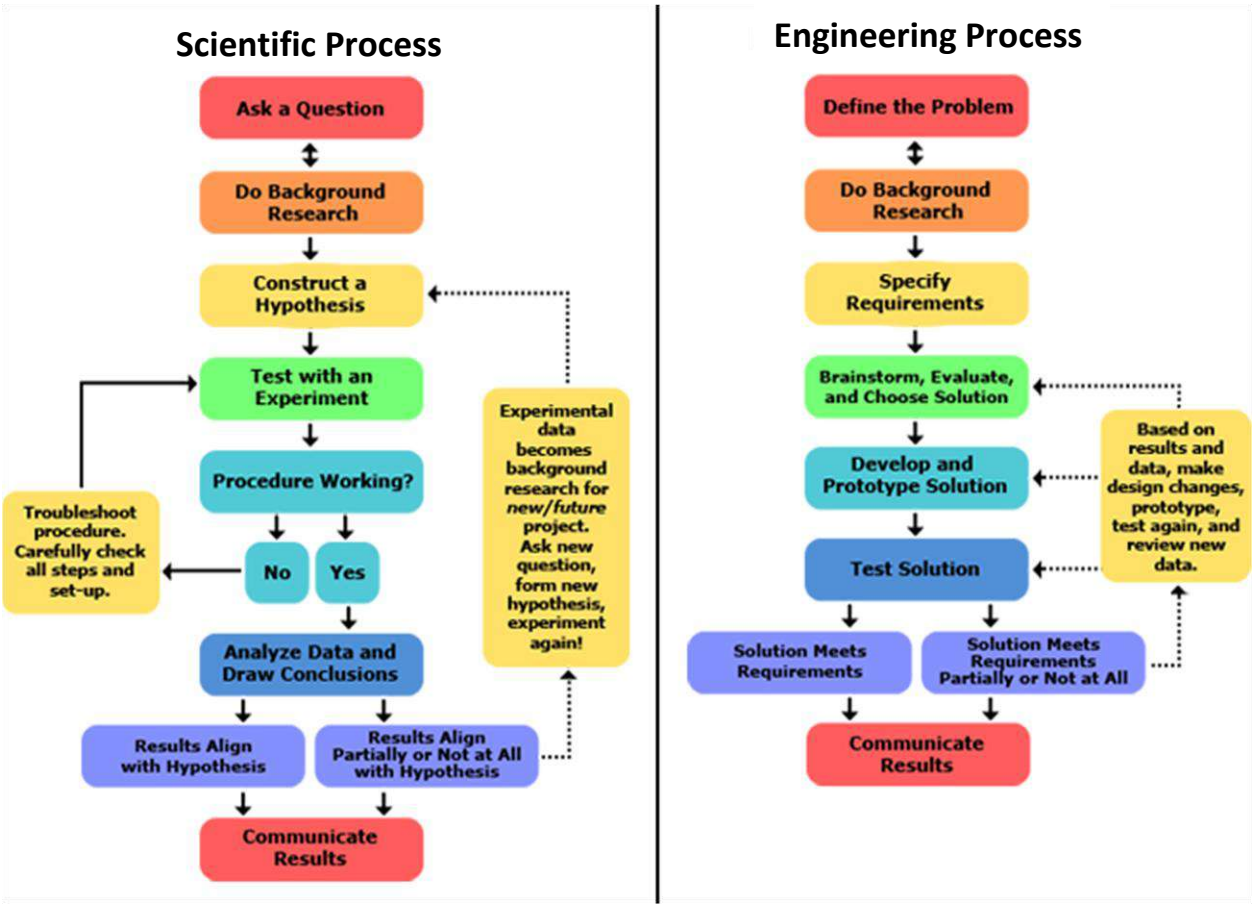
JACKSON PUBLIC SCHOOLS

Transforming lives through excellent education

# Science & Engineering Fair District Guide 2020




**Office of Teaching and Learning**
624 South President Street
Jackson, MS 39202
*Dr. Kymyona Burk, Executive Director*

# 2019-2020 SY
# Science Fair Timeline

| Key Dates | Activity Description |
|---|---|
| **Now** | **Start thinking about a possible experimental topic that will improve the world.**<br>**Notify parents and students about the upcoming school fair.** |
| **August 7-October 15, 2019** | **Students receive school science fair information from schools.** |
| **October 1-October 31, 2019** | **Topics approved by teachers.** |
| **October 16, 2019** | **Science fair training for coordinators at Jackson State University.** |
| **TBA** | **Science Night (Boards Raffle)- Various Locations** |
| **November 1- December 20, 2019** | **Students develop their projects.** |
| **January 8-17, 2020** | **School-wide science fair presentations.** |
| **January 22,2019** | **District science fair participant registration forms are due.** |
| **January 29, 2020** | **Lower Fair (Grades 1-6) -Blackburn Gymnasium** |
| **January 30, 2020** | **Upper Fair (Grades 7-12) -Blackburn Gymnasium** |
| **February 1-10, 2020** | **Collect Region II forms to be turned in to Jackson State University.** |
| **February 14, 2020** | **Turn in District participants fees and forms to JSU.** |
| **March 19-20, 2020** | **Region II competition at Jackson State University (K-12).** |
| **April 3, 2020** | **State competition (7-12 only) at Delta State University.** |

**District Science Fair Schedule**

| | |
|---|---|
| **7:00 a.m.** | **Committee meets to finalize site plan** |
| **7:15a.m.-8:15 a.m.** | **Students arrive to set up projects** |
| **8:00 a.m.-8:50 a.m.** | **Judges Breakfast and Orientation/Committee Violation Review** |
| **9:00 a.m.-11:30 a.m.** | **Judging of Exhibits [Students will present projects.]** |
| **11:30 a.m.-12:15 p.m.** | **Lunch [Exhibits area closed.]** |
| **12:15 p.m.-1:15 p.m.** | **Final Scoring Review** |
| **1:15 p.m.-2:00p.m.** | **Students take down exhibits, break down tables, and clean up.** |
| **2:00 p.m.-2:15 p.m.** | **Winners announced** |

**Jackson Public School District will follow the guidelines and forms outlined by the Mississippi Science Engineering Fair Region II**

## MSEF Region II Eligibility (Grades 1-6)

1. Any student in grades 1-6 or equivalent who attends a Region II registered school is eligible to participate.
2. Schools must be located within Region II. Region II is comprised of: Claiborne, Copiah, Hinds, Madison, Rankin and Warren counties.
3. Participation in any Regional Mississippi Fair is limited to a maximum of 3 entrants per category per class. For a school having grades 1 through 6 the maximum number of science fair entries from that school would be 60 (30 from class 1 and 30 from class 2).
4. Preregistration is required for all classes. The on-line registration process must be completed for each participant and Received by Region II by 5:00 p.m., Friday, February 14, 2020 along with registration fee. A $20.00 registration fee must be included for each participant.
5. Each student may enter only one project which covers research done during June, 2019 – February 14, 2020.

Maximum Size of Display:

76 cm (30 in deep)
122 cm (48 in wide)
274 cm (108) in height including table

## MSEF Region II Eligibility (Grades 7-12)

1. Any student in grades 7-12 or equivalent who attends a Region II registered school and none of whom has reached 21 on or before May 1 is eligible to participate.
2. Schools must be located within Region II. Region II is comprised of Claiborne, Copiah, Hinds, Madison, Rankin and Warren counties.
3. Participation in any Regional Mississippi Fair is limited to a maximum of 3 projects per category per class. The maximum number of projects for Class 3 (grades 7-8), Class 4 (grades 9-10) and Class 5 (grades 11-12) is 30 per class. Teams may compete in any of the 10 categories.
4. Preregistration is required for all classes. The on-line registration process must be completed for each participant and the Registration Form must be: (1) signed by the student, (2) parent, (3) the sponsoring teacher, and (4) received by Region II by 5:00 p.m., Friday, February 15, 2019. The registration fee for participation is $20.00 per student. Payment in full MUST accompany each participant registration batch. Schools must submit ONE school check, cashier's check or money order made **payable to MSEF-Region II**. The DEADLINE for on-line registration is 5:00 p.m., Friday, February 14, 2020.
5. Each school must have a Local Scientific Review Committee (SRC) and an Institutional Review Board.
6. Each student may enter only one project which covers research done during June, 2019 - February 14, 2020.
7. Team projects may have a maximum of three members. Each member must register on-line individually. Team participation is limited to 3 projects per school. At least two of the members must be present for judging.

Maximum Size of Display:

76 cm (30 in deep)
122 cm (48 in wide)
274 cm (108) in height including table

**Note: The District <u>WILL</u> provide display tables.**

# Judging Criteria

**Creative Ability (30)**

1) Does the project show creative ability and originality in the questions asked? - the approach to solving the problem, the analysis of the data, the interpretation of the data? - the use of equipment, the construction or design of new equipment? 2) Creative research should support an investigation and help answer a question in an original way. 3) A creative contribution promotes an efficient and reliable method for solving a problem. When evaluating projects, it is important to distinguish between "gadgeteering" and "ingenuity."

**Scientific Thought (30)** (For engineering projects, the more appropriate questions are those found in the Engineering Goals.)

1) Is the problem stated clearly and unambiguously? 2) Was the problem sufficiently limited to allow plausible attack? Good scientists can identify important problems capable of solutions. 3) Was there a procedural plan for obtaining a solution? 4) Are the variables clearly recognized and defined? 5) If controls were necessary, did the student recognize their need and were they correctly used? 6) Are there adequate data to support the conclusions? 7) Does the student or team recognize the data's limitations? 8) Does the student/team understand the project's ties to related research? 9) Does the student/team have an idea of what further research is warranted? 10) Did the student/team cite scientific literature, or any popular literature (i.e., local newspapers, Reader's Digest)?

**Engineering Goals (30)**

1) Does the project have a clear objective? 2) Is the objective relevant to the potential user's needs? 3) Is the solution workable, acceptable to the potential user, economically feasible? 4) Could the solution be utilized successfully in design or construction of an end product? 5) Is the solution a significant improvement over previous alternatives? 6) Has the solution been tested for performance under the conditions of use?

**Thoroughness (15)**

1) Was the purpose carried out to completion within the scope of the original intent? 2) How completely was the problem covered? 3) Are the conclusions based on a single experiment or replication? 4) How complete are the project notes? 5) Is the student aware of other approaches or theories? 6) How much time did the student or team spend on the project? 7) Is the student familiar with scientific literature in the studied field?

**Skill (15)**

1) Does the student/team have the required laboratory, computation, observational and design skills to obtain supporting data? 2) Where was the project performed? (i.e., home, school laboratory, university laboratory) Did the student or team receive assistance from parents, teachers, scientists or engineers? 3) Was the project completed under adult supervision, or did the student/team work largely alone? 4) Where did the equipment come from? Was it built independently by the student or team? Was it obtained on loan? Was it part of a laboratory where the student or team worked?

**Clarity (10)**

1) How clearly does the student discuss his/her project and explain the purpose, procedure, and conclusions? Watch out for memorized speeches that reflect little understanding of principles. 2) Does the written material reflect the student understanding of the research? 3) Are the important phases of the project presented in an orderly manner? 4) How clearly are the data presented? 5) How clearly are the results presented? 6) How well does the project display explain the project? 7) Was the presentation done in a forthright manner, without tricks or gadgets? 8) Did the student/team perform all the project work, or did someone help?

## Categories:

| | |
|---|---|
| **100- Behavioral/Social Science** | **800- Microbiology** |
| **200- Biochemistry** | **900- Physics & Astronomy** |
| **300- Inorganic Chemistry** | **1000- Engineering Mechanics** |
| **400- Organic Chemistry** | **1100- Mathematics & System Software** |
| **500- Earth & Environmental Sciences** | **1200- Robotics & Intelligent Machines** |
| **600- Animal Sciences** | **1300- Plant Sciences** |
| **700- Medicine & Health** | |

***Explanation of the categories can be found at:***
*https://msef2.zfairs.com/?siteid=FairInfoSchedule&f=4a819478-2397-4e40-9c6a-3429ef3b72c4*

## Competition Classes:

| | |
|---|---|
| **Class I** | **Grades 1-3** |
| **Class II** | **Grades 4-6** |
| **Class III** | **Grades 7-8** |
| **Class IV** | **Grades 9-10** |
| **Class V** | **Grades 11-12** |

## Science Fair Project Terms

| | |
|---|---|
| **Planning Sheet** | ○ Used to help organize the entire experiment |
| **Ask a Question** | ○ Ask a question to begin your experiment.<br>○ Think about a question that you can test that can benefit society or everyone's way of living.<br>○ The best questions make a comparison that will allow the scientist (you) to control changes and observe the results of those changes.<br>○ How does _____ (independent variable) affect _____ (dependent variable)? |
| **Research** | ○ Look up everything surrounding your topic in your question.<br>○ Summarize what you find in your own words. Plagiarism is a very serious offense.<br>○ Some teachers may require a research paper, however, at least 5 sources cited using APA will be required regardless of submission of research paper. |
| **Hypothesis with Reason** | ○ The hypothesis is what you think will happen in your experiment. The hypothesis is written as a statement.<br>○ Your experiment is testing your hypothesis and the reason is why you think your hypothesis is going to occur. |
| **Materials** | ○ A list of what you need to complete your experiment.<br>○ List all necessary materials in sufficient detail and the exact quantities for items. |
| **Procedures** | ○ The step-by-step method you will use to do your experiment.<br>○ Make sure someone else can follow your procedure. They should be listed in logistical order, like a recipe.<br>○ Your procedure needs to be repeated at least 3-5 times in Grades K-6 and at least 5-10 times in Grades 7-12. |
| **Results with Data tables & Graphs** | ○ Record your results in a data table. Label the title of your data table.<br>○ Average your data.<br>○ Graph your results using your data table.<br>  ○ Has the appropriate graph type been selected?<br>  ○ Is the independent variable on the x-axis and the dependent variable on the y-axis?<br>  ○ Is the data plotted correctly and clearly on the graph?<br>  ○ Does the graph have a proper scale (the correct high and low values on the axes)? |
| **Conclusion** | ○ Answer the investigative question.<br>○ State whether you proved or disproved your hypothesis.<br>○ Summarize and evaluate. |
| **Bibliography** | ○ Give credit to the books, Internet sites, journals, and people who helped you in your investigation by citing sources properly using APA format. |

| | |
|---|---|
| **Display Board** | ○ The goal of the display board is to attract and inform spectators and judges.<br>○ The display needs to reflect current year's work only.<br>○ A good title that grabs spectators and judge's attention.<br>○ Photographs of the experiment are encouraged, however, only the sides of faces should be shown.<br>○ Organize your board in a logical order. |
| **Project Logbook** | ○ A project book is accurate and has detailed notes of your experiment from beginning to end.<br>○ The more specific and detail the better. |
| **Abstract** | ○ The abstract should consistent of a (maximum) of 250 words, one-page. This is done after research and experimentation.<br>○ Abstract needs to include 1) purpose of the experiment 2) procedures used 3) data (results) and 4) conclusions. |

## Science Fair Topics to Avoid

| |
|---|
| Any topic that boils down to a simple preference or taste comparison. For example, "Which taste better: Coke or Pepsi?" |
| Most consumer products testing, asking "Which is the best?" This includes, but not limited to, comparisons of popcorn, bubble gum, make-up, detergents, and paper towels. |
| Any topic that requires people to recall things they did in the past. |
| The effect of colored light on plants. |
| The effect on running, music, video games, or almost anything on blood pressure. |
| The effect of color on memory, emotion, mood, taste, strength, etc. |
| Any topic that requires dangerous, hard to find, expensive, or illegal materials. |
| Any topic that requires measurements that will be extremely difficult to make or repeat, given your equipment. |
| The lemon & potato battery project. |
| Volcano projects. |
| Any topic on graphology or handwriting analysis. |
| Any topic on basic astrology or ESP |

## Helpful Online Resources

**Science Buddies- Science Fair Answers & Tools**
http://www.sciencebuddies.org/

**Create a Graph-Federally Funded**
http://nces.ed.gov/nceskids/createagraph/

**Bibliography Writer**

http://citationmachine.net/index2.php?reqstyleid=2&newstyle=2&stylebox=2

## Helpful Tools for Students

### Written Project Plan

NAME: _____

PROJECT TITLE: _____

_____

1. **Investigative Question(s)** (problem to be solved) What is the purpose of your experiment?

2.a. **Hypothesis** based on Investigative Question, written in the future tense.

2.b. **'If...then..."** statement of the Hypothesis

3. Procedure:
**Materials** Needed (listed vertically)

**Method** (numbered step by step instructions)

4. Identify the "**Control**" (conditions or materials that stay the same) for your experiment

5. Identify the "**Variable**" (conditions or materials that change; only 1 change at a time) for your experiment.

6. Attach Sample Data Sheets you will use to record your data (sketches, log, chart, etc.).

7. Brainstorm ideas on how to graph your data.

## What does a science fair board look like?


Figure 7.1 Example of a Good Display

- Label X/Y axis on graphs
- Provide pictures of work
- Faces can not be seen
- Provide model if applicable

## How to write an abstract?

**Sample Abstract:**

Advertisers are always touting more powerful and longer lasting batteries, but which batteries really do last longer, and is battery life impacted by the speed of the current drain? This project looks at which AA battery maintains its voltage for the longest period of time in low, medium, and high current drain devices. The batteries were tested in a CD player (low drain device), a flashlight (medium drain device), and a camera flash (high drain device) by measuring the battery voltage (dependent variable) at different time intervals (independent variable) for each of the battery types in each of the devices. My hypothesis was that Energizer would last the longest in all of the devices tested. The experimental results supported my hypothesis by showing that the Energizer performs with increasing superiority, the higher the current drain of the device. The experiment also showed that the heavy-duty non-alkaline batteries do not maintain their voltage as long as either alkaline battery at any level of current drain.

*Word Count is 166*** Do not add this part in your abstract but the abstract needs to be about 160-250 words.*

**Steps:**

1. **Write an opening sentence or two that comes from your research/ introduction that overall covers your project.**
2. **Briefly summarize your project from the question, hypothesis, procedure and materials, data, results, conclusion.**
3. **In your conclusion, say whether or not your hypothesis was correct or not and explain why it was correct or why it was not correct.**

## What will the judge ask me?

When the judge comes to your project:
—-stand up, stick out your hand and say:
—-"Hi, my name is _____ and my project is _____ (state your title)".
—-Then, BRIEFLY summarize the project in 1 minute (maybe 2).
—-Then, say: "Do you have any questions?"

**PRACTICE this with friends and family – it will help with the nervousness.**

Some judges will be judging their first science fair, while others will have judged several fairs at varying levels. Nevertheless, there are many common questions and, the more you have thought about them, the better your interview experience will be.

**20 Questions you should expect**:

- Where did you get this idea?
- How did you come up with this title?
- What research did you do?
- What was your hypothesis?
- Why did you think that would happen?
- What were your independent and dependent variables?
- What was your control?
- What did you measure and how?
- How did you calculate that result?
- Why did you choose that amount, (or measurement, or piece of equipment, etc.)?
- How did you replicate the experiment?
- What does that graph tell you?
- How variable were your results and what might explain the variability?
- What did you base that conclusion on?
- Why/How are your findings important?
- Who might want to know this information?
- What would be the next experiment you would do?
- What was the hardest part (or most fun, or most exciting, or most surprising, etc.)?
- Who helped you?
- If you had to do it all over again, is there anything you would do differently?

## General Science Fair Oral Presentation

When you decide to be in a science fair, you must consider your presentation as important as any other part of your project. Practice will make the difference in how well you present yourself to the judges.

Here is a step-by-step approach to constructing your presentation:

1. Introduce yourself. "Hello, my name is _____."
2. Give the title of your project. "The title of my project is_____."
3. Explain the purpose of your project. "The purpose of my project is_____."
4. Tell the judges how you got interested in this topic.
5. Explain your procedure. "The procedure I followed was_____."
6. Show your results. If you have charts, graphs, or a notebook, show them to the judges and explain them. If results are shown on your backboard, point them out.
7. List your conclusions. Explain what you have proven. If you think that you had some problems or error in your experiments, don't be afraid to admit these.
8. Tell the judges what you might do in the future to continue your experimentation. What would you have done differently if you were to do the project again?
9. Of what importance is your project to the world? Explain any applications of your study.
10. "Do you have any questions?" If you do not know the answer to a judge's question, then say, "I'm sorry, I don't know the answer, but I think the answer is_____." Do not "fake" like you truly know an answer when you really don't. If a judge is asking a question, then he / she most likely knows the real answer.
11. Thank the judges.

Most science fairs limit the amount of time for your presentation. Therefore, it is very important to use that time well. You will want to impress your judges with your project, your knowledge, and your **enthusiasm**. All people are affected in one way or another by the way we look, the way we talk, and the way we act. Adults are usually impressed with good manners and nice cloths. Here are some tips:

1. Wear your best clothes. Really dress up.
2. Stand up straight on both feet when a judge approaches your project. Don't sway from foot to foot.
3. Stand to the side of your exhibit so the judge can get a good look at your project.
4. Look straight into the eyes of your judges. Pay attention to each of your judges.
5. Get the judges involved in your project. Let them hold your research paper, notebook, or apparatus. Point out charts, graphs, and photos.
6. DO NOT CHEW GUM OR CANDY!
7. Speak loudly enough to be heard by all of your judges. Remember some of them are "OLD" and hard of hearing.
8. Smile!
9. Be Polite!

## District Science Fair Committee

Dr. Kevin Gaylor, Instructional Technology
Janet Wallace- Curriculum Lead- New Teacher
Andrea Burroughs-Curriculum Lead- K-12 Social Studies
Allen Price, Curriculum Lead-Elementary Math
Dr. Angela Ellison, Curriculum Lead- Secondary Math
Kartessa Bell, Curriculum Lead
Stephanie Clark, Curriculum Lead-Secondary ELA
Keisha Flannigan, Curriculum Lead-Secondary ELA
Dr. Erica McKenzie, Curriculum Lead-Elementary Science
Jessica E. Johnson, Curriculum Lead-Secondary Science, Coordinator
Lori Harris, Administrative Secretary, Textbook Coordinator
Marvin Grayer, Principal, Blackburn Laboratory Middle School
Blackburn Laboratory Middle School Custodial Staff
Angela Givhan, Director, Teacher Development, Secondary
Dr. Kymyona Burk, Executive Director, Office of Teaching and Learning

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