MARSHDALE SCIENCE FAIR

DIVISION I (Grades K-1)
DIVISION II (Grades 2-3)
DIVISION III (Grades 4-5)

REGISTRATION AND INSTRUCTION PACKET

January 25, 2021

Science Fair Coordinator: Ginger Dickinson

IN THIS PACKET

- **Important Dates** – This contains all the important dates necessary for the Science Fair. You may want to enter these dates on your family calendar
- **How to do a Science Fair Project** – Follow these steps to complete your SF project
- **Science Fair Rules** – Use this sheet to check your project and display against the rules
- **Tips For Science Fair Projects**
- **2021 Science Fair Categories** – This will help you identify your project category on your Registration Form and give you some project ideas.
- **Registration Form** – This form needs to be turned in by January 4, 2021
- **How to Create and Label your Board**
- **Scientific Method** – This sheet explains the Scientific Method and how to use it to complete your project
- **Suggestions for Lab Notebooks** – Use these ideas to create a great Lab Notebook
- **Making the Display** – This sheets gives ideas for a Science Fair Display Board
- **Student / Adult Involvement Form** – This form needs to be placed in your Lab Notebook
- **Judging Form** – This will help you determine if you have covered everything required for your SF project and will let you know what the judges are looking for

IMPORTANT DATES

- **December 16, 2020 6:30 pm**
  Informational meeting via Zoom. We will go over changes for this year, how it will look and any general science fair questions you may have. A link will be sent out before the meeting.
- **January 4, 2021**
  Science Fair Registration Form due via email- gingerdickinson35@gmail.com
- **January 11, 2021**
  This is the last day to report changes in your Science Fair project category and/or title of your project. Please report any project changes to the science fair coordinator. If you make any changes after this date, you may not be eligible for science fair competition.
- **January 25, 2021**
  All projects need to be emailed to the coordinator. Feel free to email the project prior to this date if you have it completed.
- **January 25, 2021 - February 8, 2021**
  Judging and results completed. Project judging will be done with a word document online. Each project will be judged by 2 judges and scores averaged. Results will be posted on the Marshdale PTA website. Certificates and/ or ribbons will be mailed.
- **March 1, 2021**
  Mountain Area Science Fair and Engineering Fair begins.

** The 1st place winners in each category from DIV II and DIV III will be sent to compete in the MASEF. This will also be conducted online. There are usually a great number of projects and final results will be posted as soon as we get them all judged. Please refer to the MASEF website for results https://masef.weebly.com/*

HOW TO DO A SCIENCE FAIR PROJECT

Step 1: Read the Science Fair Rules. This information will be helpful as you prepare to do your Science Fair project.

Step 2: Choose your topic. There are lots of ideas in this packet to choose from. Be sure to pick a topic that interests you. If your idea isn't listed in the packet, that's okay.

Step 3: Fill out AND turn in your REGISTRATION FORM. This form lets the Science Fair Coordinators know how many projects will be entered.

Step 4: Use the SCIENTIFIC METHOD to carry out your project. Carefully follow the steps outlined in this packet. Make a good NOTEBOOK. Write lots about what you see and measure. The judges will look carefully at this record of your project. It is good to point out where you are using the scientific method (ie. Use of variables, controls, etc.). See the "Tips for Your Lab Notebook" page. Lab notebooks can now be done on a computer in a word or google doc.

Step 5: Conduct RESEARCH on your project. Do a bit of research on your project. You may use the Internet, local libraries or any other available resource.

Step 6: Build your DISPLAY, POWERPOINT, GOOGLE SLIDE, or other platform after you have finished your experiments. You are welcome to do a display board and take close up pictures of all the pieces. If you go with an online platform there should be a minimum of 10 slides and a maximum of 12 slides. For those in DIV III you may add an additional slide with your interview piece. Do NOT include your name, pictures of you, or any other identifying information within the project itself.

Step 7: Fill out the STUDENT/ADULT INVOLVEMENT FORM. The STUDENT / ADULT INVOLVEMENT FORM should be filled out by the adult who helped with the Science Fair project. This form will need to be emailed along with the project.

Step 8: Review the JUDGING information. Think of questions about your project and answer them as well as you can. Ask your parents or another adult to look at your display with you – let them ask you questions. This practice and review can point to ways you can improve your project before it goes to the Science Fair. This will help you make changes, if necessary, to your display or presentation.

Step 9: Congratulations! You are done! Email final project to gingerdickinson35@gmail.com You will get an email confirming it was received and can be opened and seen.

Step 10: Projects will be judged starting on January 25th.

SCIENCE FAIR RULES

1. Please do NOT have names, teachers, grade level or any other identifying marks on your projects, including photos of yourself. Each display will be assigned a numbered code during registration. After the judging, your name will be attached to your project.
2. All displays must be constructed by a student during this school year. Only one entry is allowed per student. No group projects.
3. Students should do as much of the project as possible and have a full understanding of the concept. Age appropriate projects are expected. An adult may give advice and assistance during development, research, and construction of the project. The Student/Adult Involvement Form included in your packet must be completed and signed by an adult and included with your lab notebook. The extent of adult involvement is one of the factors considered by the judges.
4. Projects can be done as a PowerPoint or Google document. We will also accept pictures of a traditional board style project. If there is another version that can be sent over email that you would like to use please contact the coordinator. Please have a minimum of 10 slides/ pictures and a maximum of 12. Unless you are DIV III and then there will be one extra slide for the “interview”. Or if the student chooses we can also do a ZOOM interview.
5. Projects may NOT have animals, alive or dead. Experiments involving the use of any animals must demonstrate and document appropriate humane treatment of those animals.
6. Judges are permitted to disqualify any project that is not based on scientific premises, and no ribbon will be awarded to such project.
7. Each display will be judged by a panel of qualified judges. Where possible, each judge will have professional expertise in the category of the exhibit.
8. **Do include** your lab notebook with your signed Student/Parent Involvement sheet. This may be emailed with the project

TIPS FOR SCIENCE FAIR PROJECTS

The most important thing about a Science Fair Experiment is that you have a testable question. That means that you are only looking at one variable (thing that is different) when you do your experiment. All other aspects have to be constant (or the same).

Science is about exploring our world and questioning how or why things work the way they do. It allows us to better understand the world around us, which in turn, leads us to being able to better exist in our environment. A good Science Fair Project is one that is based on something you are truly interested in. A real question you have about the world we live in.

Science Fair Judges like to see projects that are current and relevant because it shows that the student is thinking about the world around them and questioning things that they observe or hear about on the news. It is so important to keep your project SIMPLE. If it gets too complex, you are likely to have multiple variables, which would require multiple experiments. In the Science Fair world, simple usually does well because the goal of the fair is to show that the student truly understands the Scientific Method. For younger students (K – 3rd Grade) – I would suggest keeping the project very simple and easy to follow. For older students (4th – 6th Grade), more complex ideas and subjects are good to show the child's level of scientific discovery – however, you must be careful not to let the project get too complicated that it would be hard for a judge to follow. An important skill one acquires during Science Fair is Time Management.

Please plan well in advance to complete your project. Not only do you need to spread out the work so that you don't get burned out, but you need to make sure that you have the necessary time to finish the project. Especially with projects in the field of Botany, where you may need several weeks to make your observations. The Notebook is the Nuts and Bolts of the experiment. It is the most important document for your project. This is where the judges will go to find the level of understanding the student has of the subject matter and the scientific method. The Lab notebook should be the map to your experiment. It should follow your experiment from start to finish. It should be handwritten, yet organized. It should include ideas, thoughts, interviews, questions, sketches, changes, mistakes, charts, data, etc…. Everything you do should be in your lab notebook and easy to follow. Tip – use tabs for the different sections so that you have plenty of room and can easily access the right place to jot things down.

Display is the first thing that lures the viewer to your project. It should be neat, well thought out, and creative. It should peak the viewer's interest and make them want to investigate further. It is an 'Overview' of your project and should give the viewer a general idea of what you were trying to do and the outcome. Make sure to do your display yourself and take pride in how you present it. These tips work for an online slide presentation or word document.

Parents – it is okay to get involved! It is one of the best things about Science Fair – that it is something that parents can help their children with outside of school. The key is to have the appropriate level of involvement for the age range of the student. There should be more help for the younger kids and should lessen as they get older, changing from helping, to a more supportive role. But keep in mind, judges like to see as much work as possible done by the child. If the parent is doing part of the project, that needs to be reflected on the Student / Parent Involvement Sheet.

Science Experiments can be fun! But please do not forget the importance of Research. Investigating the subject and gathering more knowledge about the topic, helps the student to design a better experiment and might even lead the student down a different path by sparking another question that they hadn't thought of previously. Please be sure to cite your sources on ALL Research.

20/21 Mountain Area Science Fair Categories

Here are the Mountain Area Science and Engineering Fair (MASEF) categories for science fair projects, along with some ideas for questions within each of the categories. It is important to note that the questions cannot be answered with a simple YES or NO.

MASF Category	Examples	Question Ideas
Earth and Environmental Science	Weather Fossils Volcanoes Earthquakes Erosion Ocean currents Air pollution Recycling Water ecology Wetlands Ecosystems	Which places in Evergreen have the most air pollution? Does warm water cause more erosion than cold water? What happens when fresh water meets salt water? What conditions produce sand dunes? Does freezing affect rocks? Is recycled paper different from regular new paper? How does acid rain affect plant growth? What is the best way to clean up an oil spill? Does the pH of snow differ? How do toxic wastes affect the environment?
Botany	Anything concerning plants	How do different wavelengths (colors) of light affect plant growth? How much water does a plant need to grow? Which grasses grow best with minimum water? What effect does light have on seed germination? How does temperature or fertilizer affect growth? How do different plants vary in their water-holding capacity? How do desert plants survive? Are plants affected by the angle of light? How does the salinity of water affect plants? How can you control thistles? What is the best way to ripen fruit?
Human Body Health and Behavior	Nutrition Effects of drugs Disease prevention Learning Exercise Color perception	Do things taste different when you can't smell them? Does eating sweets make you better at playing video games? How does exercise or time of day affect pulse rate? Does body size determine lung capacity? How does light affect color perception? Can folded people retain their sense of direction? Are fingerprints really unique? Does age affect hearing? Does toothpaste really make a difference? Do antibacterial soaps or lotions make a difference?
Microbiology	Molds Yeast Pond life	Do molds grow better in dry or humid conditions? What microscopic life is in the pond near my house? How does acid rain affect the cell structure of Spirogyra (a common pond alga)? Footwear vs. Bacteria? Can the antibacterial effects of garlic be improved by application of garlic extract during growth of the garlic plant? What conditions are necessary for bacteria to grow? Under what conditions does mold grow? Why does yeast make bread rise? What happens if I change the amount of yeast? What conditions affect the rate of mold growth - wrapped or unwrapped, in or out of refrigeration, type of food?

Zoology	Anything concerning animals **Animal Behavior Only (cannot affect health/well being of animal)**	Will my dog eat his food if I turn it different colors? Can my hamster learn tricks? How do different conditions affect a gerbil's choice of bedding material? Does the fat layer under the skin keep an animal warm? Do all dogs like water? How far do mealworms travel? Do cats really respond to catnip? Can hamsters learn? What are the habits of wild birds at my feeder? Does age affect how quickly dogs learn tricks
Aerodynamics and Fluid Mechanics	Paper airplanes Rocketry	Which paper airplane design will fly the best? Do rockets fly higher with longer or shorter fins? Which style of paper airplane is the best when comparing weight to distance flown? Make an airplane out of to achieve the longest flight? How many helium balloons does it take to lift a person weighing 100 pounds? Can I use a balloon to lift a heavy book? Do other additives besides salt make objects float better then objects in plain water? Can I make a disk float?
Chemistry	Elements Evaporation Crystals Expansion of materials Acids / bases	Does cooking change the amount of vitamin C in vegetables? Why do we use baking soda to make a cake? What pH level is most conducive to corrosion in iron and copper? Can red cabbage juice be used to differentiate between acids and bases? Can chromatography be used to identify which pen a note was written with? Which kinds of food contain starch molecules? Can a spectroscope identify different elements? What conditions affect the rate that lifesavers dissolve in water? Which carbonated substance will make raisins float the best? What shines pennies the best? How do natural and chemical dyes compare? Does the amount of oxygen affect burning time?
Electricity, Electronics, and Magnetism	Crystal radio Computer design Radar Lasers Solar electricity Batteries Magnets Circuit boards Insulation	How much power do different types of batteries provide? What effect does a resistor have on a circuit? Which materials are the most conductive? What makes an electric circuit work? Does temperature affect battery life? Why does electricity need to be grounded to work? Does type of use affect battery life? Can electricity be stored? How does distance affect magnetic strength?
Material Science	Properties of diapers or paper towels Freshness due to plastic wraps Rust Detergents	Which brand of diaper absorbs the most, uh, water? Which zipper sandwich bag seals the best? What paper towel is the most absorbent? Which diaper holds the most liquid? Which wrapping keeps sliced apples fresh the longest in a refrigerator? Which plastic wrap keeps food fresh longest at room temperature? Which paper towel is the strongest?

Physics	Light Machines and motion Heat and combustion	Does color affect solar absorption? What refracts light? What happens when billiard balls collide? What conditions affect light refraction? How does distance or pollution affect light? How does insulation affect heat retention? Can water wheels be a home energy alternative? How does water depth affect pressure? How does the steepness of a hill affect pulling resistance? Who goes farther on a sled?
Structures	Bridge failures Earthquake damage Effects of pollution Roman arches Ship design	Which design of bridge will support the most weight? Why do heavy boats not sink? What kind of dam works best? What makes a strong joint? How strong are eggshells? Why are spider webs strong? How can a horse support its weight? What bridge design is strongest by weight? What shape is the strongest, most suitable for a certain purpose? What type of roofline is the best for snowy climates?

Computer Science and Engineering

MASEF will now be accepting both Scientific AND Computer Sciences / Engineering projects for Division III. The engineering process is used to design and solve a problem. If the project is an innovation or a challenge that does not have just one variable – it can go into this category.

Sciencebuddies.org has general information and ideas about both scientific and engineering projects: www.sciencebuddies.org/engineering-design-process/engineering-design-compare-scientificmethod.shtml

Each project must use one of the two following methodologies:

1. Scientific Method Engineering Process

Question Idea
Specific question based on an observation Identify your goal (need your product/program will Having just one variable satisfy) and your target user

Hypothesis Research
What you think is the best answer to your Should address all important facets of the project (science Question – the outcome you expect concepts, math formulas, existing products/programs)

Procedure (test) / Method (design and test)
Design your experiment, include each step Based on research, establish design criteria, use this for Make sure to list materials and identify controls preliminary designs that address the target user. Make and the variable, make observations, and record sure to explore multiple approaches and be able to data. Repeat several times (multiple trials) justify the chosen approach

Results
Keep a log, graph, diagram etc., of your work. Keep a log, graph, diagram etc., of your work Conclusion

Analysis/Discussion/Conclusion
Summarize your project, what happened? Does the product/program represent significant Did you get the answer you expected? improvements over existing products/programs? Is it useful to target user? Does it fill a meaningful need?

Examples:
How does the quality of bearings Design a better skateboard bearing
affect the performance of a skateboard? (Engineering / Computer Science Category) (physics category)
How does humidity affect the strength of wood? Design a structure to support 100 lbs of load that spans
(Material Science category) 24” at any humidity. Using only popsicle sticks and glue. (Engineering / Computer Science Category).

In general, if you have a project that will test something using just one variable, then it will go into one of the scientific method categories, if you are designing something, then it will go into the Computer Science / Engineering category.

2. Computer Science and Engineering

Computer programming and analysis, engineering design etc. Some examples of projects for this category would be: Test how a computer counts letters, searches the internet, burns a cd, or how to move a character on screen. Write a program to alphabetize a list of words, do simple calculations, determine the strength of passwords, or create animation. Design a robot to clean your room, a bridge that will span 2 feet with certain perimeters, a more efficient vacuum cleaner, a faster skateboard, a better calculator, a skyscraper that can withstand a certain amount of wind, etc.

MARSHDALE SCIENCE FAIR 2021

Registration Form – All Divisions
January 4th, 2021

All registration forms must be emailed to gingerdickinson35@gmail.com.

PLEASE PRINT CLEARLY.
NAME: _____ PHONE #: _____
(First and Last)

EMAIL: _____

GRADE: _____ TEACHER'S NAME: _____

My project will be in the following category (check one):

❑ Aerodynamics / Fluid Mechanics
❑ Material Science
❑ Botany
❑ Microbiology
❑ Chemistry
❑ Physics
❑ Earth & Environmental Science
❑ Structures
❑ Electricity, Electronics & Magnetism
❑ Zoology
❑ Human Body, Health & Behavior
❑ Computer Science and Engineering
(no need to fill in the variable questions)

Question/ Hypothesis: The question I will try to answer is:

_____

Procedure: Briefly describe your project:

_____

_____

Control Samples (samples the scientist does not change):

_____

_____

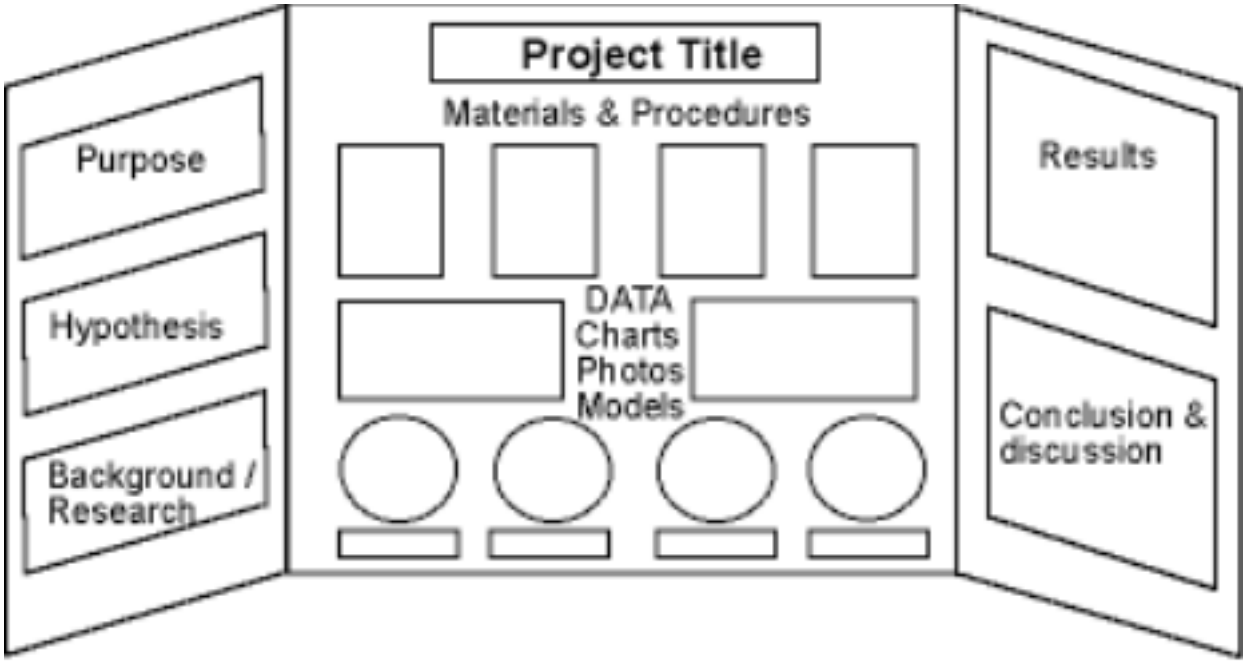
Independent Variable (change a scientist makes to a sample to determine its effect):

_____

Dependent Variable (change caused by the independent variable – this is measured and recorded):

_____

SCIENCE FAIR DISPLAY BOARDS AND LABELS



Option 1: The Scientific Method

Use this as your guideline. Record everything in your notebook!

A science fair project asks a question and then uses 5 steps called the Scientific Method to discover an answer. The term scientific method sounds pretty complicated but it is actually 5 simple ideas that scientists use to solve problems.

1. **What I wonder (Observation & Question)**
2. **What I think (Hypothesis)**
3. **What I did (Experiment)**
4. **What I found (Results)**
5. **What I learned (Conclusion)**

***If you choose to do a Research or Collections Project you don't have to answer your question using the steps listed above. A Research or Collections Project explains and displays information about a topic you are interested in.*

• **What I Wonder (Observation & Question):** Make an observation about something that interests you that can be the topic of your science fair project. Based on your observation, come up with a question you would like to answer on this topic. General or broad questions usually tend to be research projects that are hard to test (How does an airplane fly? What causes a tornado?) Testable questions would be more specific. (What airplane design travels farthest? How do existing weather conditions affect the severity of a tornado?) This is where the research comes in, investigate and gather facts on your topic, enter them into your notebook.

• **What I Think (Hypothesis):** Make a prediction (hypothesis) of what you think will happen (the answer to your question). This is important to do before you perform the experiment.

• **What I Did (Experiment/Procedure):** Design an experiment to answer your question. You will gather data (information) that supports or contradicts your hypothesis. Remember, a good experiment shows results that can be measured and repeated. Be sure to:

- Write out each step of your experiment. Be very detailed and number your steps.
- Identify the 3 different variables.
  - Control Sample – the variable that does not change. Example: The speed at which you throw the paper airplane
  - Independent/Changing Variable – the variable you change on purpose. Example: I will change the type of paper airplane in the experiment.
  - Dependent Variable – the variable you measure and record. Example: I will measure the distance the paper airplane flies.
- Perform the experiment
  - Make observations and record measurements and data carefully. Include everything just as it happens even if it proves your hypothesis incorrect. Repeat experiment, if possible, to allow for variations in results.
- List materials – Make a list of everything you need to perform your experiment.

• **What I Found (Results):** What happened (example: speed increased, growth was better for the fertilized group)? Record in notebook. You may want to record your findings in graphs, tables, or pictures when making your display.

• **What I Learned (Conclusion):** Examine your data and come to a conclusion about what happened. Record in notebook. At this point you may do some more research to compare and contrast your project to documented experiments. Also, are there any new questions you have now about this topic? What other experiments or observations might add to your knowledge?

Option 2: The Engineering Process

Use this as your guideline. Record everything in your notebook!

The engineering design process is the set of steps that a designer takes to go from first identifying a problem or need to creating and developing a solution that solves the problem or meets the need. The steps of the engineering design process are to:

- **Define the problem**
- **Background research**
- **Design criteria**
- **Preliminary designs: brainstorm, choose the best solution**
- **Solving the problem: build a prototype, test and redesign**
- **Record your data/results**
- **Analysis / Discussion / Conclusion**

During the engineering design process, designers frequently jump back and forth between steps. Going back to earlier steps is common. This way of working is called iteration, and it is likely that your process will do the same! While engineers create new things, such as products, websites, environments, and experiences, scientists study how nature works.

• If your project involves making observations and doing experiments, your project might better fit the Steps of the Scientific Method.

• If you are not sure if your project is a scientific or engineering project, you should read Comparing the Engineering Design Process and the Scientific Method. (*information and links from sciencebuddies.org)

• **Define the problem:** look around you to see to find a need you or others have.

Three key questions:

- What is the problem or need?
- Who has the problem or need?
- Why is it important to solve?

This should help you find your idea. Write down: Who need(s) what because why.

• **Background research:** What does your user want? What products already exist related to the need you found? Write down all the information you find and where you found it: interviews, books, internet, etc.

• **Design criteria:** What are the requirements for your project to be successful? Think about how your project should work. The design criteria tell you what your project should do to be successful. Are there other things that would be nice to have? Write down your design criteria clearly and follow it.

• **Preliminary designs:** brainstorm, choose the best solution

- Think about different ways to solve your problem. There may be many ways to meet the need. What is the best solution? Are you able to build it? Be sure to write down all of your ideas.
- Your preliminary designs should follow the design criteria defined above.

• **Solving the problem:** build and test a prototype

- Draw pictures or write a plan
- Build a model or prototype; engineering takes many iterations or tries. You may need to improve your design and try it again. Test and redesign your prototype.

• **Data/Results:** Record in notebook. You may want to record your findings in graphs, tables, or pictures when making your display.

• **Analysis / Discussion / Conclusion:** Examine your data and come to a conclusion about what happened. How did your project work? Record in notebook. Is your project useful, does it meet a need?

Suggestions for Lab Notebooks

1. Get a notebook and write down the date you first start on your project.

2. Brainstorm possible topics with your friends and family.

3. Write down the ideas.

4. Decide on one question and circle it.

5. Start a new page with your question clearly stated and date it,

6. Do background research - go to the library, usw the Internet, or interview an expert. List all resources you used.

7. Write down notes or paste in articles.

8. Form a hypothesis on the answer you think you will get to your question. Write it down and date it 9. Form a list of items or materials that you will need for your experiment.

10. Write the procedure or directions of how you will perform your experiment. Be very detailed and number your steps.

11. Determine your variables and control.

12. For observational research, decide on a time frame and note taking procedures.

13. Do your experiment and date it.

14. Make a table or chart for the results of the experiment.

15. Write down any interesting observations even if they don't exactly fit with your questions. This will show the judges that you are learning from your experiment.

16. Repeat the experiment if possible and date it.

17. Write down your conclusions and compare them to your hypothesis.

18. Use your notebook to make your display and/or computerized graphs, charts, tables, etc.

19. Your notebook must accompany your display. The judges do spend time to see the work that went into your display!

Note: Please, no names on the notebooks. Lab Notebooks will be part of the judging process

CREATING THE PRESENTATION

OPTION 1: The traditional board- photographed and put into slides or a word document. The display is an important part of your project. Show pride in your presentation. Eye catching drawings, 3-dimensional graphs, photographs, and easily read writing (it's okay to hand write or type on a computer) will make your exhibit stand out. Be creative!

1. Purchase a Display board using the form found at the end of this packet or at any various office/craft supply stores in the area.
2. Plan the display so that it tells the story of your project. Each step of the scientific process should be part of your display. Include the Title, Question that you asked, your hypothesis and procedure, results and conclusions. Pictures or graphs of your results will help people understand what happened in your experiment, and your notebook should have all of these things already written out. Photographs can help tell a story, and if you need special equipment, include that in your display too (keep in mind the Science Fair Rules). It is very important that your display is neat and easy to read in appearance, and tells a complete story about your project.
3. Make sure your name is not on your display board. Also, photographs should not include pictures of you or members of your family.
4. Put your project title on the front of your NOTEBOOK and place it in front of your display. You can also place samples or equipment with your notebook. Check the rules! You should place a DO NOT TOUCH sign by messy or fragile items.
5. Fill out the STUDENT/ADULT INVOLVEMENT FORM and put it in the front of your lab notebook.
6. Pretend you have never seen your display. Does it tell a story? Is it easy to read? Are all the words spelled correctly? Does your display represent what is in your notebook? Does it look like you had fun? If you answered yes to these questions— CONGRATULATIONS! You've done a great job!

OPTION 2: PowerPoint, or Google Slide presentation.

Try to keep each slide like it was a piece/ part of what would have been on the board. Be creative while keeping to neatness and clarity. A minimum of 10 slides to a max of 12 should cover all the topics. I will accept more if it pertains to the project. Please refrain from adding slides merely for artistic value- keep it to science! If you are in Division III there is an interview piece that goes along. You can add a slide with a typed tutorial or a video interview. You will be given a 6 question prompt to help you with that part. You may also request a zoom interview with the judges. The interview is judged along with the project and counts in with your score.

OPTION 3: If you or your student has another online version that they are more comfortable please contact the coordinator. This year is a new one for us all and many avenues will be acceptable. Even a video of the student wearing a mask / using a pointer to walk through the board on a video. You can get creative!

STUDENT/ADULT INVOLVEMENT FORM

Directions: On the line for each stage of the project, mark the appropriate percentage that indicates how much work the student did. Examples: If the student did all the work, mark 100%. If the student did most of the work, mark 80%. If there was a more equal sharing of effort between adult and child, mark 60% or 40%. If an adult did most of the work, mark 20%. If an adult did all the work, mark 0%. If something was not done at all, mark Not Done.

Stages of Project	**Percent of Student Involvement**						
	100%	80%	60%	40%	20%	0%	Not Done
Thought of a Problem							
Formed a Question							
Conducted Background Research							
Talked with Experts							
Kept Lab Notebook During Project							
Designed an Experiment (n/a for research only category)							
Performed the Experiment (n/a for research only category)							
Wrote about Results							
Made Graphs or Tables							
Designed the Display							
Made the Display							
Used the Computer During Project							
Learned to Use Applicable Software							
Used the Computer to Make Display							
Learned Something							
Had Fun							

How did YOU, the student, choose your project/subject?

_____

_____

_____

Adult/Parental short comments on involvement- NO NAMES PLEASE

_____

_____

MARSHDALE ELEMENTARY SCIENCE FAIR JUDGING FORM
SCIENTIFIC METHOD

Project #_____ Category_____

Project Title_____ TOTAL _____/ 47 POINTS (standard projects)

Appearance

0	1 Not very Neat or Clean, Misspellings	3 Neat, Clean, Attractive Overall, Correct Spelling

Communication / Display

0 Display missing	1 * Some elements are missing: incomplete or inaccurate. * Unorganized or limited organization, multiple errors.	3 * Most elements are present and accurate. * Understandable visuals and/or models; few errors * Somewhat organized and creative.	5 * The display clearly & accurately shows student's understanding of the Purpose / Question, Hypothesis, Materials and Procedures, Data Charts and / or Graphs, Results, and Conclusions; all are clearly labeled. * Colorful, inventive / unique visuals, no errors and highly organized with significant attention to detail.

Creativity/Originality

0	1 * Project shows low amount of creativity. * Lacks grade appropriate student involvement.	3 * Project shows average amount of creativity. * May be common but student made it their own with a fresh approach on a traditional idea * Grade appropriate.	5 * Project shows a high amount of creativity. * Student made significant effort to make project their own; unique grade appropriate involvement & explains evidence of their independent contributions. * Investigated an original question or used an original approach or technique.

Student Involvement

0 Missing Form	1 Sheet shows a low amount or no involvement by the student. (0-50%)	3 Sheet shows a medium amount of involvement by the students. (50-75%)	5 Sheet shows a high amount of involvement by the student. (75-100%)

Lab/Research Notebook

0 Missing Notebook	1 Missing significant project details	3 Missing some project details.	5 Careful record keeping that follows student's project from beginning to end. This should include with initial brainstorming, experimental design, predictions, recorded observations, data collection, relevant materials, final results and conclusions.

Research Question

0 Question / Hypothesis missing	1 * Question / Problem not clear, testable, related to investigation / project or addresses an issue already known or has a common solution. * Variable(s) not included.	3 * Question / Problem is somewhat clear. * Asks a testable question and is related to investigation/project * Hypothesis/Prediction somewhat addresses the question but may contain some flawed ideas * Some variable(s) included but not complete or are not clearly identified	5 * Question / Problem is realistic, specific and very clear, includes cause & effect and can be answered by doing an experiment. * Developed Hypothesis / Prediction is logical and addresses the question very clearly, is testable (measureable), related to the problem & leads directly to the investigation.

Background Research

0 No research done	1 * Some sources were listed but did not summarize the information or did not list sources. * Copied sources off the internet or other source.	3 * Literature was summarized in the students' own words. * Accessed age- appropriate sources for background research. * One or two sources were cited but some parts of the literature did not directly relate to the experiment.	5 * Relevant information gathered/presented in display and/or notebook;summarized in student's own words. * Accessed a minimum of three, age-appropriate sources cited with bibliography. * Reviewed a variety of sources such as magazines, internet, interviews, trade books and summarized the information in their own words? * Student explains reasons for their prediction from the literature review, prior observations or experiment.

Experimental Design

0 * Procedure missing * There is no attempt to design a test of the hypothesis * No materials listed or incomplete list	1 * Materials and variables list not detailed, complete or clear * Procedure not clear or has serious flaws, but there's enough info so that the reader has an idea of what was done. * There is no description of how or if data will be collected.	3 * Lists some materials and steps but needs more detail; may be difficult for someone else to repeat in exact way. * Procedure is clear and sequential & tests the original hypothesis but there may be some flaws apparent.	4 * Materials list is very specific. * Experimental procedure is very clear, well constructed, easy to follow, step by step and accurately followed to perform an experiment. Is the procedure logical & repeatable? * Investigation tests hypothesis completely changing only one variable at a time. * Solved problems that arose with the experimental procedure. If necessary, redesigned the procedure and tried the experiment again.

Controls/Repetition

0 * No controls or variables listed or too many undefined variables	1 * Controls defined but no repetition to confirm data	2 * Includes only 2 repetitions * Variables evident	3 * Describes multiple tests, at least 3, or uses enough tests or samples to support or not support hypothesis * Independent (manipulated), Dependent (responding) and Controlled variable(s) are included and are clearly identified.

Results/Analysis

0 * Data missing * No summary of results	1 * The data is not clear and does not help make any judgments about the prediction or hypothesis. * No use of photos / charts / graphs to display data. * Results not clearly summarized not included.	3 * The data is appropriate to test the hypothesis and is somewhat clear / incomplete. * Data displayed accurately and labeled but may have some minor point missing. * Good use of photos / charts / graphs to display data.	4 * Data accurately related to the stated prediction or hypothesis. * Summary describes in sentence form what was discovered using appropriate graphs or charts with no errors or omissions. * Discusses connections between variables or points out patterns/ trends.

Conclusion / Reflections

0 Conclusion missing	1 * Conclusions not logical or correct or have major errors. * Doesn't state whether hypothesis was supported. * Doesn't suggest problems with the project and ways to improve it.	2 * Conclusions not clearly supported by the data. * Conclusions and inferences logical and correct w/ minor errors. * States whether or not the hypothesis was supported but there may be some minor errors.	3 * Conclusions logical, correct, clearly supported by the data & relate back to the hypothesis, key scientific concepts, and background research * May raise a new question or has real world application. * Accurately states whether or not the hypothesis was supported. * States an idea of what might be important for further research and /or generates new questions in paragraph form with details.

MARSHDALE ELEMENTARY SCIENCE FAIR JUDGING FORM
COMPUTER SCIENCE & ENGINEERING

Project #_____ Category_____

Project Title_____ TOTAL _____/ 50 POINTS

Appearance

0	1 Not very Neat or Clean, Misspellings	3 Neat, Clean, Attractive Overall, Correct Spelling

Communication / Display

0 * Display is missing	1 * Some elements are missing: incomplete or inaccurate. * Unorganized or limited organization, multiple errors.	3 * Most elements are present and accurate. * Understandable visuals / models; few errors * Somewhat organized & creative.	5 * The display clearly & accurately shows student's understanding of the Purpose/Question, hypothesis, Summary of research findings, Materials and Procedures, data charts and/or graphs, results, and conclusions are clearly labeled. * Colorful, inventive/ unique visuals, no errors and highly organized with significant attention to detail.

Student Involvement

0 * Missing form	1 * Low amount or no involvement by the student. (0-50%)	3 * Medium amount of involvement by the students. (50-75%)	5 * Hight amount of involvement by the student. (75-100%)

Lab/Research Notebook

0 * Missing notebook	1 * Missing significant project details	3 * Missing some project details which could include dated entries with initial brainstorming, experimental design, predictions, recorded observations, data collection, any relevant materials, final results and conclusions.	5 * Careful record keeping that follows the student's project from beginning to end. * This should include dated entries with initial brainstorming, experimental design, predictions, recorded observations, data collection, any relevant materials, final results and conclusions.

Idea

0	1 * Product/program not identified. * Need the program will satisfy is not defined. * Goal is not clear. * Target users are not identified.	3 * Product/program somewhat identified. * Need the program will satisfy is somewhat defined. * Goal is somewhat clear. * Target users are somewhat identified.	5 * Product/program identified. * Need the program will satisfy is defined. * Goal clear. * Target users identified

Background Research

0	1	3	5
* No research done	* Some sources listed but did not summarize the information or did not list sources. * Copied sources off internet/other source.	* Literature summarized in the students' own words. * Accessed age-appropriate sources for research * One or two sources were cited but some parts of the literature did not directly relate to the experiment.	* Relevant information gathered and presented in display and/or notebook and summarized in students own words. * Accessed a minimum of three, age-appropriate sources cited with bibliography. * Reviewed variety of sources such as internet, trade books, interviews and summarized info in own words? * Student explains reasons for their prediction from the literature review, prior observations or experiment.

Method – Design Criteria

0	1	3	5
* No design criteria	* Not established or clearly defined * Does not show consideration of research in development keeping in mind the target user.	* Somewhat established and clearly defined * Somewhat shows consideration of research in development keeping in mind the target user.	* Established and clearly defined and shows consideration of research in development keeping in mind the target user.

Method – Preliminary Design

0	1	3	5
No preliminary design	* Not present in notebook. * Not clear and doesn't follow the design criteria. * Did not explored multiple approaches to solving the problem and is able to justify the chosen approach.	* Somewhat present in notebook. * Somewhat clear and follows the design criteria. * Somewhat explored multiple approaches to solving the problem and is able to justify the chosen approach.	* Present in notebook. * Clear and followsdesign criteria. * Explored multiple approaches to solving the problem and is able to justify the chosen approach.

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Method – Build And Test a Prototype

0	1	3	5
No prototype	* Did not develop test plan for evaluating each iteration of the program/product. * Did not follow the plan when testing the design and subsequent designs. * Did not use information from testing to improve product /program (redesign and retesting until the design and criteria were reached)	*Showed somewhat development of test plan for evaluating each iteration of the program/product. *Somewhat followed this plan when testing the design and subsequent designs. *Somewhat used of information from testing to improve product/program (redesign and retesting until design goal and criteria were reached)	*Development of test plan for evaluating each iteration of the program/product. *Followed this plan when testing the design and subsequent designs. *Use of information from testing to improve product/program (redesign and retesting until the design goal and criteria were reached)

Data / Results

0	1	3	4
* Data is missing *No summary of results	* Data is not clear and does not help make any judgments about the prediction or hypothesis. * There was only incomplete attempt to include data * There is no use of photos / charts / graphs to display data. * Results are not summarized clearly or a summary was not included	* Data is appropriate to test the prediction or hypothesis and is somewhat clear * Data is displayed accurately and labeled but may have some minor point missing * Good use of photos / charts / graphs to display data * Summary is incomplete or describes what was discovered using graphs and/or charts with few errors or omissions	* Data are clearly and accurately related to the stated prediction or hypothesis * Data is accurately recorded and organized with tables, graphs, lists, charts or drawings including labels and units * Summary describes what was discovered using appropriate graphs and/or charts with no errors or omissions in sentence form. * Discusses connections between variables or points out any pattern or trends

Analysis / Discussion / Conclusion

0	1	3	4
* Conclusion is missing	* Conclusions not logical or correct or major errors. * Does not state whether or not the prediction was supported. * Does not suggest problems with the project and ways to improve it.	* Conclusions are not clearly supported by the data. * The conclusions and inferences are logical and correct with some minor errors. *States whether or not the prediction / hypothesis was supported but there may be some minor errors present. * States an idea of what might be important for further in research and /or generates new questions	* Conclusions are logical & correct and clearly supported by the data and relate back to the hypothesis, key scientific concepts, and background research * May raise a new question or has real world application. * Accurately states whether or not the hypothesis was supported * States an idea of what might be important for further research and / or generates new questions in paragh form with details.

Marshdale SCIENCE FAIR – ORAL JUDGING FORM

Project # _____ Category _____

Project Title:_____

Can the student explain the purpose and motivation of the project?		1 Gives a limited explanation of the purpose and motivation of the project.	3 Gives a good explanation of the purpose and motivation of the project.	5 Gives an excellent explanation of the purpose and motivation of the project.
Does the student show knowledge of the subject matter and theory used?		1 Expresses limited understanding of the project or science content.	3 Expresses a good understanding of the project and science content.	5 Expresses excellent understanding of the project and science content and explains its relevance.
Can the student explain all the elements of project development?		1 Gives a limited explanation of all the elements of project development.	3 Gives a good explanation of all the elements of project development.	5 Gives an excellent explanation of all the elements of project development.
Can the student explain the project results and conclusion?		1 Explains what happened but not why, or the why does not connect to the data.	3 Explains project results and uses data to explain the why.	5 Explains project results and uses data and background research to explain why.

Total Points _____ / (20 maximum)

Judge's Comments:

Oral Sub-total **(20 max)**_____

Static Sub-total **(47 or 50 max)**_____

Total Score (67 or 70 max)_____