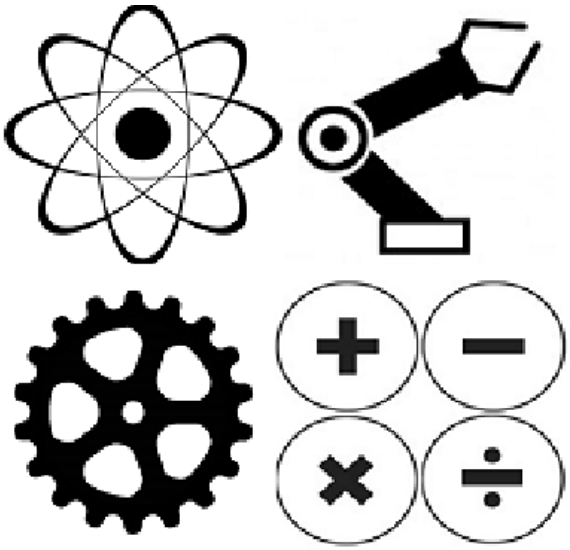
PALM BEACH COUNTY SCHOOL DISTRICT

2018 DISTRICT ELEMENTARY MATHEMATICS, SCIENCE, AND STEM FAIR



STUDENT-PARENT GUIDE

Table of Contents

General

Projects

Forms

THE SCHOOL DISTRICT OF PALM BEACH COUNTY

Superintendent

Dr. Robert Avossa, Ed. D.

Deputy Superintendent

Dr. David Christiansen

School Board Members

District 1, Barbara McQuinn
District 2, Chuck Shaw, Board Chairman
District 3, Karen Brill
District 4, Erica Whitfield,
District 5, Frank A. Barbieri, Jr., Esq.,
District 6, Marcia Andrews
District 7, Debra Robinson M.D., Vice Chairwoman

Assistant Superintendent of Teaching and Learning

Diana Fedderman

Program Planners

Mickey Banek, K-5 Mathematics
Julia Mate, K-12 STEM
Thomas Salinsky, K-5 Science

WHAT IS THE DISTRICT ELEMENTARY FAIR?

The Palm Beach County School District's Elementary Math, Science, and STEM Fair is an academic competition, held annually for public, private, charter, and home school organizations. Students must participate in a School Fair first to advance to the District Fair competition. The District Fair is the highest level of competition for elementary students in kindergarten through grade five.

THE CLASSROOM TEACHER'S ROLE

The classroom teacher's role is to model the process and coach their students on how to create testable questions. Classroom teachers should provide all the appropriate oversight, guidance, and support the learner's need to succeed. The checklist below lists the classroom teacher's responsibilities.

- Model the math investigation, science experiment, and engineering design processes.
- Provide learners with topic ideas and other idea resources.
- Assign individual projects.
- Make certain each idea is appropriate for the learner's grade level and skills.
- Approve any animal or human subject experiments.
- Explain the timeline and chunk any assignments by due date.
- Inform the parents of all expectations and keep them in the communication loop.
- Provide materials, tools, and an appropriate place to work.
- Provide ongoing instruction and support with fidelity.
- Show learners how to organize and layout their project board.
- Check the spelling, grammar, skill, accuracy, and content for completeness.
- Assess the learner's performance.
- Enter completed projects into your School Fair.

THE PARENT'S ROLE

Parents play an important role in their child's success in completing a project. The following checklist will assure parents provide the assistance needed.

- Discuss the learning expectations of the project with your child.
- Review the timeline and assignment due dates.
- Provide any materials, tools, or resources they need to complete the project.
- Set a time and quiet place to do the work.
- Encourage your child to do their best and monitor their progress.
- Support them in completing their assignment.
- Check their spelling, grammar, skill, accuracy, and content for completeness.
- Help them to plan and organize the project board layout before gluing anything down.
- Tell them only paper, pictures, and graphs can go on their boards, no other objects.
- Help them by providing suggestions.
- Help deliver their project to school safely by the due date.

REMEMBER!

The project board tells the judges everything that took place in the investigation. All projects MUST be certified complete to be judged. Students will NOT be present at the District Fair judging.

Research papers, logs, or notebooks are NOT scored at the District Fair and cannot be displayed. All data should be organized in a data table that is glued on the project board. Conclusions should be supported by the data.

INADMISSIBLE AT THE ELEMENTARY DISTRICT FAIR

The following are **NOT ALLOWED** ⊗ at the Elementary District Fair competition and could result in a project **NOT** being certified for display and judged.

- ⊗ Mold, bacteria, or virus projects, or other active harmful cultures
- ⊗ Chemical use without adult supervision, including those found at a grocery, drug store, or home improvement store
- ⊗ Living animal projects without an **Animal Approval Form**
  Experiments involving living invertebrate or vertebrate animals must not injure, harm, or kill the animal. An ***Animal Subjects Approval Form*** must be completed and signed before experimenting begins.
- ⊗ Human subject projects without a **Human Subjects Approval Form**
  Experiments involving human subjects as participants must have the materials, procedure, any tests, questions, or surveys approved before experimenting begins. A ***Human Subjects Approval Form*** must be completed and signed before experimenting begins.
- ⊗ Human participation in an experiment without an **Informed Consent/Assent Form**
  Human participants in any experiments need parental informed consent (permission) and participants need to assent (agree) to participate. An **Informed Consent/Assent Form** must be read and signed by all participants before experimenting.
- ⊗ Preserved specimens, body parts, taxidermy, dissections, or autopsy photos
- ⊗ Dirt, soil, minerals, rocks, radioactive substances, or compost samples on the display board
- ⊗ Solids, liquids, gases, chemicals or compound samples *(including water)* on the display board
- ⊗ Any food of any kind *(human or animal - including candy, snacks, or treats)* on or with the display board
- ⊗ No medicines, vitamins, poisons *(including plants)*, drugs, or radioactive materials of any kind
- ⊗ Dry ice or other inappropriate substances on or with the display board
- ⊗ Flammable substances, candles, lamps, burners, or other heating devices on or with the display board
- ⊗ Batteries, wet or dry cells on or with the display board
- ⊗ Real money, coins, or currency of any nation on or with the display board
- ⊗ Plastic, wood, metal, fabric, foam, or any material that keeps the project board from closing flat
- ⊗ Awards, ribbons, medals, or certificates from School Fair competitions
- ⊗ Photographs showing student faces *(experimenters or subjects)*
- ⊗ Student or school names on the front or side panels
- ⊗ Project board over 36 inches high by 48 inches wide
- ⊗ Headers or anything sticking out of the sides or bottom of the project board
- ⊗ Papers, log books, pictures, or objects not attached to the display board
- ⊗ Staples, clips, push pins, brads, nails, tacks, or sharp objects of any kind attached to the display board
- ⊗ Entering projects in multiple divisions or inaccurate grade level

The Elementary District Fair Committee reserves the right to disqualify any project from judging that is considered unsafe or inappropriate, and remove it from public display. Students, parents, and teachers are responsible for checking their display boards before registering them in the District Fair competition to make sure they comply with the rules and have all the appropriate forms needed for certification.

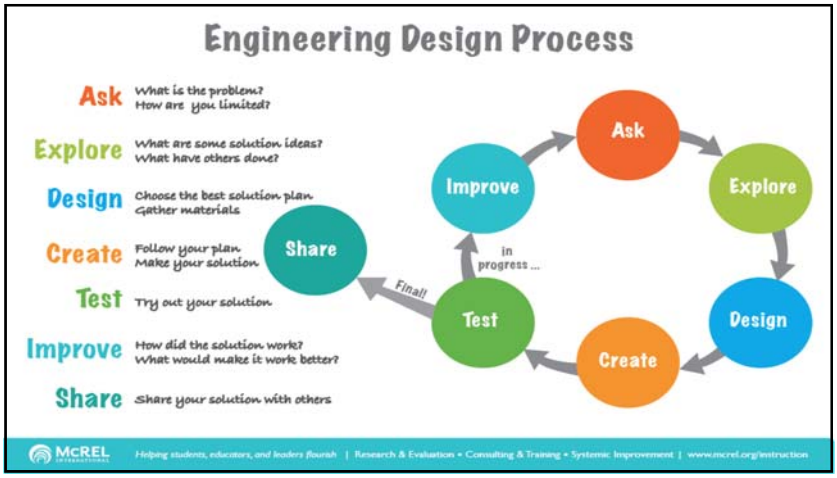
TYPES OF PROJECTS

Math Projects investigate a problem and gather data which the learner analyzes mathematically. The focus is on the math skills and processes used to explain the investigations results. Consumer-product surveys are good examples of math fair projects. Consumers are polled about their likes and dislikes. The data gathered is analyzed mathematically by the learner and the results of the survey are explained. Winning math projects should reflect the learner's grade-level, math skills, and abilities. The labels and descriptions required on a math project board and a scoring rubric can be found on pages 8-11.

Science Projects involve designing an experiment to test a hypothesis. The focus is on the scientific processes and skills needed to explain the data collected in the experiment. The data is organized into a table, examined for trends, and used to support any conclusions made about the results of the experiment. The project should reflect the science standards learned and rigor expected at each grade-level. The labels and descriptions required on a science project board and a scoring rubric can be found on pages 12-15.

STEM Projects involve the integration of science, technology, engineering, and mathematical concepts applied to solve a real-world problem. Students will design an investigation to solve a real-world problem using the engineering design process.

The labels and descriptions required on a STEM project board and a scoring rubric can be found on pages 17-19.



Digital Expo Projects are created digitally in a variety of formats including but not restricted to, School District Vodcasts, Microsoft PowerPoint, or Apple Keynote. Students entering a digital project can choose to do a traditional display board, digital project, or both. The top 5 digital projects from each School Fair may be submitted per school to the District Fair Digital Expo. These projects will be viewed by students participating in the District Fair and three Kid's Choice Awards (1st, 2nd, and 3rd) will be selected. Projects must be 5 minutes or less in duration and include the same components required on the respective project display boards.

Project URLs will need to be submitted using a GOOGLE FORM that will be shared with schools. Resources for converting POWERPOINT and KEYNOTE to video, working in DISCOVERY EDUCATION BOARD BUILDER, or uploading videos to VODCAST are available in *Blender* on the Elementary Science course page under the Mathematics and Science Fair Unit to all Palm Beach County school teachers. The Digital Expo Project scoring rubric can be found on page 20.

THEME PROJECTS

Theme Projects are math, science, or STEM projects which investigate specific content areas. Individual students in grade levels 3-5 can choose to do their investigations in one of four themes: Aviation, Green, Physical Science, or Energy. These projects are judged by grade level in the school's fair first. If they win first or second place in their School Fair and match one of the themes below, they can be entered in that theme for judging in the District Fair. Grade 3, 4, and 5 projects compete together in each theme at the District Fair, but there are fewer projects and more chances to win awards.

Aviation projects, sponsored by PALM BEACH FLIGHT SAFETY INTERNATIONAL, must investigate a ***flight*** concept (i.e., kites, planes, helicopters, hovercrafts, or drones) or a ***flight safety*** concept (i.e., air traffic or passenger safety). Ribbons are awarded for first, second, and third place.

Green projects, sponsored by the ELEMENTARY SCIENCE TEAM, must investigate ***recycling*** *or* ***reusing*** materials or investigate ***conservation concepts*** (plant, animal, or habitat) or ***preservation concepts*** *(*i.e., soil, plants, or animals). Ribbons are awarded for first, second, and third place.

Physical Science projects, sponsored by UP-N-RUNNING MACHINERY INC., must include a ***hand-made design*** (machine), which is designed, engineered, and tested. Ribbons are awarded for first, second, and third place.

Energy projects**,** sponsored by FLORIDA POWER & LIGHT, must investigate an ***energy*** concept (light, heat, sound, magnetism, or electricity) or ***energy conservation***. Ribbons are awarded for first, second, and third place.

MATH PROJECTS

Mathematics Projects involve designing an investigation to test a conjecture that answers a question or solves a problem. Data should be collected during the investigation, then organized into a table or graph. The data should then be used to support or disprove your conjectures. The project should examine a mathematics standard with the rigor expected at your grade-level. The steps below explain the components you will need to display on your math project board.

LABELS	WHAT TO WRITE ON MY MATH BOARD
Problem/ Question	The problem is a statement/question explaining what you are investigating. **Research** your topic and learn more about the problem you are investigating, what has already been studied, and what questions still remain about your investigation topic. Your research will help you understand more about your problem and help you write a conjecture that can be proven by collecting experimental data.
Hypothesis/ Conjecture	A **conjecture** is a prediction based on incomplete information. It uses the research you gathered during your research to inform your conjecture and design an investigation that you can use to test your prediction.
Materials	This includes a list of all the equipment and materials you used in your investigation. List each item by quantity, in a column, and include the units of measure wherever applicable.
Procedure	The procedure is a list of all the steps in your investigation, in the exact order you perform them. Be clear, but keep it simple. Other mathematicians should be able to **replicate** your experimental results by following the same procedures.
Data Tables	Data is a written record of all the observations (**qualitative data**) and measurements (**quantitative data**) made in your investigation. It is important to record everything that takes place. Include photographs from various phases of the investigation (do not photograph any human faces). Include the data (including units) from the trials that took place during your investigation in a data table and/or graph (bar, line, and circle graphs are all excellent ways to display your data). Your calculations and graphs should be made using both **accuracy** and **precision**. Note: tables, charts, and graphs can be layered on top of each other when taped on the project board.
Conclusion and Proofs	Write a conclusion explaining the results/outcome of your investigation or any patterns found in the investigation (provide data from your investigation that supports these statements). Do your results support or reject your conjecture? What issue/problems occurred during your tests that may have affected your results, if any? Any conclusions you make must be supported by proofs (the data recorded in your tables/charts/graphs).
Real World Connections	Real Life Connections explain how your project relates to the real-world, or how it pertains to everyday life. Why is it important to know the results of your project? Could it create new jobs or career opportunities? How does it benefit or apply to our everyday experiences?

MATH PROJECTS

Math projects can be entered as whole **Class** (in grades K, 1 & 2), **Individual** (in grades 3, 4, or 5) or **Team** projects (in grades 3, 4, or 5).

Projects are judged by grade-level in four different entry categories: **A**ccess (Access Point learners), **R**egular classroom (regular and inclusion learners), **D**ual Language (dual language learners), and **G**ifted (learners with a gifted I.E.P.).

Math projects may also be checked as **Theme Projects** for separate judging by our community partners. The themes include **Aviation**, **Green**, **Physical Science**, and **Energy**.

Math projects can also be entered as **Digital Expo** projects judged by our participating students.

Project Title: _____ **Project Number:** _____

Mathematics Project Rubric

All Math Projects are scored based on the same 5 judging criteria. The target questions under each criterion will help you make your final decisions. Most questions are objective; however, some are subjective by the nature of the competition.

Math Criterion	Description	Possible Points	Total Points
Investigation	Is a problem posed and a hypothesis stated?	/2 pts.	_____/50 pts.
	Is a procedure clearly described and numbered?	/4 pts.	
	Are solutions to the problem tested using multiple methods or strategies?	/15 pts.	
	Is the data organized in tables, and/or analyzed in graphs?	/4 pts.	
	Are any conjectures made according to the patterns found in the data?	/15 pts.	
	Does the project provide proofs to support or disprove the conjectures ?	/10 pts.	
	Comments:		
Creativity	Is the project mostly the student's own work?	/5 pts.	_____/20 pts.
	Is the project original or creative?	/5 pts.	
	Is there evidence that the topic was researched beforehand?	/3 pts.	
	Is the data well organized?	/5 pts.	
	Are the math principles being applied correctly?	/2 pts.	
	Comments:		

Project Title: _____ **Project Number:** _____

Math Criterion	Description	Possible Points	Total Points
Thoroughness	Are the materials and tools listed by quantity?	/2 pts.	_____/10pts.
	Is the procedure listed in order of operation?	/1 pt.	
	Is the procedure/plan articulated clearly for others to replicate with similar results?	/3 pts.	
	Have the results been organized in tables? Analyzed in graphs? Are patterns explained?	/4 pts.	
	Comments:		
Skill	Is the project idea grade-level appropriate?	/2 pts.	_____/10pts.
	Is the project content rigorous compared to others in the same grade-level category?	/3 pts.	
	Are the conjectures (claims) supported by the proof (evidence)? If not, does it explain why?	/5 pts.	
	Comments:		
Clarity & Neatness	Is the data displayed complete (i.e., measurements and units)? Precise? Accurate?	/3 pts.	_____/10pts.
	Are the findings well explained?	/2 pts.	
	Is the overall investigation displayed in a logical order?	/2 pts.	
	Is the spelling and grammar correct (a sliding scale is appropriate)?	/3 pts.	
	Comments:		

Judged by: _____ **Total number of points:** _____/100pts.

SCIENCE PROJECTS

Science Projects involve designing an experiment to test a hypothesis, while using scientific process skills to collect and record data. The data is organized into a table and the data is used to support and explain any conclusions. The project should examine a science standard with the rigor expected at your grade-level. The steps below explain the components you will need to display on your science project board.

LABELS	WHAT TO WRITE ON MY SCIENCE BOARD
Purpose	The **purpose** describes the how, *what*, *when*, *where*, *which,* or *why* about your investigation. It is a written statement about the idea or question you want to learn more about. Before writing your purpose, **research** the idea or question. Read to find out as much as you can about your topic in a library, media center, or on the internet before starting your experiment. The research you do should help you understand the idea better so you can write a hypothesis *(prediction)* and design an experiment *(test)* to investigate.
Hypothesis	The **hypothesis** is a prediction that can be tested. It is usually written in the form of a testable question describing what you think will happen. It could also be written as an "If ____, then _____"statement. Your research should help you write a testable hypothesis. A good hypothesis tests one **variable,** or factor, at a time. The factor you think will change in your experiment is called the **test variable**. Any other variables which might affect the outcome of your experiment need to be measured and monitored so they will not change or interfere with the outcome. These factors are called **controls,** because you are measuring and monitoring them. Each control should be the same each time you experiment. Some experiments may have more than one control, but should only have one test variable. Repeat your experiment three (3) times with exactly the same test variable and controls used in your first experiment, the repetition of the experiment are called **trials**. Observe and record any changes in your test variable during each trial. The results of all three trials should be similar.
Materials	This is a list of all the **materials** and **tools** used in your experiment. Write a list including each material by quantity (how much of it you use). Describe all the consumables (materials used-up) and non-consumables (tools or equipment) you used. Use metric measuring tools (tape measures, balances, graduated cylinders, thermometers, etc.) rather than standard measuring tools (rulers, scales, cups, spoons, etc.) if they are available. Use a Fahrenheit thermometer (F^o) to measure temperature if a Celsius (C^o) thermometer is not available. Use a clock, watch, or stop watch to record time.
Procedure	The **procedure** is the steps of your experiment. Your experiment should be designed to tests your hypothesis. List all the steps in their order of operation. Be clear and keep it simple. Another scientist should be able to replicate your experiment by following your procedure. Ask your teacher or parent to check your procedure to make sure it is safe and doesn't harm you or your test subjects. If your experiment is using humans or animals as test subjects, you **must** complete a **Human Subject Approval** (p. 27) or **Animal Subject Approval** (p. 26) Form before you start experimenting. If your experiment involves human test subjects, they need to have a signed **Informed Assent Form** (showing their parent's permission) and also sign their own **Informed Consent Form** (confirming their own decision to participate in the experiment). These forms are combined and can be found on page 28. When all the required documentation has been signed, you may begin your experiment.

SCIENCE PROJECTS

LABELS (CONTINUED)	WHAT TO WRITE ON MY SCIENCE BOARD
Data Tables	**Data** are your recorded observations during each experimental trial. First, decide how you will observe and measure your data as you experiment. Record the amount of change using metric measuring tools (for length, height, mass, volume, or temperature). Apply the appropriate units (meters, grams, liters, and Celsius degrees). Measure and record any changes in frequency to the test variable using a clock, watch, stopwatch, or calendar in seconds, minutes, hours, or days. Record any changes in qualities like shape, size, color, odor, smell, or texture (qualitative data) to the test variable. The more accurate your measurements are (quantitative data) and the more precise your explanations are, the better. Try to have a balance of **quantitative** (number and units) and **qualitative** (descriptions) data. Organize your data into a **data table.** Include data from all three (3) **trials** so it is easy to compare data sets and identify any **trends** (patterns). The data table should be glued to the display board so judges can evaluate it. You can also make a graph contrasting your trials if you like (graphs are optional). Compare the results of each experimental trial. Notice how alike one trial is compared to another. Look for patterns (trends) in your data. Make as many **claims** (true assertions) as you can describing each pattern. Match each claim with the **evidence** (from your data table) that supports it.
Conclusions	A **conclusion** explains the results and outcome of your investigation. It should either confirm (agree with) or reject (disagree with) your original hypothesis. Explain your results using the claims (patterns) and evidence (data) you gathered in the last step. A conclusion can be a simple statement like, "Apples grow from flowers." or "Magnets attract iron." However, each claim you match to evidence from your data validates that claim. For example, "A fruit grows where a flower falls off the tree, because apples grew in the same place the flower fell off." or "The magnet pulled the nail, so the nail might contain iron." Write one sentence for each claim and evidence set. Link the claim and evidence with a conjunction. Conjunctions are words like, "and, but, or so," adverbs like, "instead, therefore, or for example," or subordinate conjunctions like, "as, since, or because." The more sentences you write, the stronger your conclusions.
Real World Connections	**Real World Connections** explain how your project relates to the real-world and how it pertains to everyday life. Does it help plants, animals, people, or the earth? Could it create new jobs or work? Could it become a new product or technology? How does it benefit or apply to our everyday experiences?

Science projects can be entered as whole **Class** (in grades K, 1, & 2), **Individual** (in grades 3, 4, or 5) or **Team** projects (in grades 3, 4, or 5).

Projects are judged by grade-level in four different entry categories: **A**ccess (Access Point learners), **R**egular classroom (regular and inclusion learners), **D**ual Language (dual language learners), and **G**ifted (learners with a gifted I.E.P.).

Science projects may also be checked as **Theme Projects** for separate judging by our community partners. The themes include **Aviation**, **Green** , **Physical Science**, and **Energy.**

Science projects can also be entered as **Digital Expo** projects judged by our participating students.

Project Title: _____ **Project Number:** _____

Science Project Rubric

All Science Projects are scored based on the same 5 judging criteria. The target questions under each criterion will help you make your final decisions. Most questions are objective; however, some are subjective by the nature of the competition.

Science Criterion	Description	Possible Points	Total Points
Investigation	Is a purpose presented and a hypothesis stated?	/10 pts.	____/50 pts.
	Are the materials and tools used listed by quantity?	/10 pts.	
	Does the procedure describe all the steps of the experiment in the correct order?	/5 pts.	
	Are observations collected in the 3 trials recorded in a data table?	/6 pts.	
	Does the data include qualitative and quantitative observations?	/4 pts.	
	Are the conclusions supported by the recorded data?	/10 pts.	
	Are there other investigation elements like drawings, photos, or graphs?	/5 pts.	
	Comments:		
Creative Ability	Is the project original or creative?	/1 pt.	_____ /5 pts.
	Is it evident the topic was researched prior to writing the hypothesis?	/1 pt.	
	Does the data recorded use a variety of descriptive language?	/1 pt.	
	Is the real-world connection or connection to career appropriate?	/1 pts	
	Are scientific skills and processes being applied appropriately?	/1 pts.	
	Comments:		

Project Title: _____ **Project Number:** _____

Science Criterion	Description	Possible Points	Total Points
Thoroughness	Are the materials and tools listed by quantity?	/2 pts.	____ /10pts.
	Is the procedure listed in order of operation?	/1 pt.	
	Is one variable being tested and all controls being monitored?	/3 pts.	
	Is the procedure articulate enough for others to replicate with similar results?	/4 pts.	
	Comments:		
Skill	Is the project idea grade-level appropriate?	/5 pts.	____ /25pts.
	Is the project content rigorous compared to others in the same grade-level category?	/10 pts.	
	Is the information displayed accurate (correct) and precise (complete)?	/10 pts.	
	Comments:		
Clarity & Neatness	Is the display in a logical order?	/2 pts.	____ /10pts.
	Is the content understandable and to the point?	/2 pts.	
	Are the descriptions and explanations well-written?	/3 pts.	
	Is the spelling and grammar correct (a sliding scale is appropriate)?	/3 pts.	
	Comments:		

Judged by:_____ **Total number of points:** ____/100pts

STEM PROJECTS

STEM projects involve the integration of science, technology, engineering, and mathematical concepts applied to solve a real-world problem. Students will design an investigation to solve a real-world problem using the engineering design process. The steps below explain the project components you will need to display on your project board.

LABELS	WHAT TO WRITE ON MY STEM BOARD
Problem/ Question	A problem is a statement/question explaining what you are investigating. Research your topic and learn more about the problem you are investigating, what has already been studied, and what questions still remain about your investigation topic. Your research will help you understand more about your problem and help you write a ***hypothesis*** that can be tested by collecting experimental data.
Explore/ Hypothesis	A hypothesis is a prediction that you make about the problem you are investigating. It uses the research you gathered in the last phase of the investigation to form your hypothesis and design an experiment that you can use to test your prediction.
Design/Plan	A plan is your initial idea or brainstorm of how you might go about testing your hypothesis. It might include your initial design and general information about how it will help you investigate your problem, and/or technical drawings that you will use in the create/procedure phase.
Materials	This will include a list of all the equipment and materials you use in your investigation. List each item by quantity, in a column, and include the units of measure wherever applicable.
Create/ Procedure	The procedure is a list of all the steps in your experimental trials, in the exact order you perform them. Be clear, but keep it simple. Other scientists should be able to ***replicate*** your experimental results by following the same procedures.
Improve/Test	Explain how your design has changed from the initial design/plan phase. Include information about how your tests have informed your design changes and include any other important information about modifications that you have made to your product, experiment, or procedures. Once you have determined the best experimental design for your investigation, conduct three trials ***(repetition)*** and gather data.
Data	Data is a written record of all the observations ***(qualitative data)*** and measurements ***(quantitative data)*** made in your experimental tests. It is important to record everything that takes place. Include photographs from various phases of the investigation (do not photograph any human faces). Include the data (including units) from all three trials that took place during your improve/test phase in a data table and/or graph (bar, line, and circle graphs are all excellent ways to display your data). You should include a sketch, image, or technical drawing of your final design using both ***accuracy*** and ***precision***. Make sure your final design has a title, labels for the various parts of your product/process, and measurements (using units) for each sketch, image, or technical drawing. Note: drawings, tables/charts, and graphs can be layered on top of each other when taped on the project board.

STEM PROJECTS

LABELS (CONTINUED)	WHAT TO WRITE ON MY STEM BOARD
Share/ Conclusion	The conclusions section includes statements explaining the results/outcome of your investigation (provide data from your investigation that supports these statements). Do your results support or reject your hypothesis? What issues/ problems occurred during your tests that may have affected your results, if any? Any ***claims*** (assertions) you make must be supported by the data recorded in your tables/charts/graphs. Provide information about whether or not your design worked and how it could be improved.
Real World Connections	Explicitly identify the science, technology, engineering, and mathematical concepts utilized in your investigation. Explain how your investigation relates to the real-world and/or career.

STEM projects can be entered as whole **Class** (in grades K, 1, & 2), **Individual** (in grades 3, 4, or 5) or **Team** projects (in grades 3, 4, or 5).

Projects are judged by grade-level (K-5) in four different entry categories: **A**ccess (Access Points learners), **R**egular classroom (regular and inclusion learners), **D**ual Language (dual language learners), and **G**ifted (learners with a gifted I.E.P.).

STEM projects may also be checked as **Theme Projects** for separate judging by our community partners. The themes include **Aviation**, **Green**, **Physical Science**, and **Energy**.

STEM projects can also be entered as **Digital Expo** projects judged by our participating students.

Project Title: _____ **Project Number:** _____

STEM (Science, Technology, Engineering, and Mathematics) Project Rubric

All STEM Projects are scored based on the same 5 judging criteria. The target questions under each criterion will help you make your final decisions. Most questions are objective; however, some are subjective by the nature of the competition.

STEM Criterion	Description	Possible Points	Total Points
Investigation	Is there a problem posed and a hypothesis stated?	/2 pts.	____ /50 pts.
	Is there evidence that research was conducted to determine possible solutions?	/4 pts.	
	Is there a procedure clearly described and numbered?	/2 pts.	
	Are solutions to the problem tested using multiple methods or strategies?	/13 pts.	
	Is there evidence that improvements were made to the design of the solution based on previous tests?	/13 pts.	
	Is the data organized in tables, and/or organized in graphs?	/4 pts.	
	Are there connections to math, science, engineering, AND technology clearly evident in the project?	/12 pts.	
	Comments:		
Creative Ability	Is the project mostly the student's own work?	/5 pts.	____ /20 pts.
	Is the project original or creative?	/5 pts.	
	Is the real-world connection or connection to career evident within the project?	/5 pts.	
	Is the data well organized?	/3 pts.	
	Are the mathematics and scientific principles being applied correctly?	/2 pts.	
	Comments:		

Project Title: _____ **Project Number:** _____

STEM Criterion	Description	Possible Points	Total Points
Thoroughness	Are the materials listed by quantity?	/1 pt.	____ /10 pts.
	Is there alignment between the problem, hypothesis, procedure, and conclusion?	/2 pts.	
	Is the procedure/plan articulated clearly for others to replicate with similar results?	/3 pts.	
	Do the conclusions reached match the data displayed on the board?	/4 pts.	
	Comments:		
Skill	Are the science AND mathematics topics grade-level appropriate?	/2 pts.	____ /10 pts.
	Is the project rigorous compared to others in the same grade-level category?	/3 pts.	
	Are the engineering AND technology components grade-level appropriate?	/5 pts.	
	Comments:		
Clarity & Neatness	Is the data displayed complete (i.e., measurements and units)? Precise? Accurate?	/3 pts.	____ /10 pts.
	Are the findings well explained?	/2 pts.	
	Is the overall investigation displayed in a logical order?	/2 pts.	
	Is the spelling and grammar correct (a sliding scale is appropriate)?	/3 pts.	
	Comments:		

Judged by: _____ **Total number of points:** ___ /100 pts.

Digital Project Rubric	1	3	5	Points Awarded
Investigation	☐ The project's purpose, hypothesis, procedure, & conclusion are not clear. ☐ The data gathered is not complete or not explained.	☐ The project's purpose, hypothesis, procedure, & conclusion are somewhat clear. ☐ The data gathered is mostly complete.	☐ The project has a clear purpose, hypothesis, procedure, & conclusion. ☐ The data gathered from the investigation is easy to understand.	____ /5 pts.
Creative Ability	☐ The subject of the project has been done many times. ☐ The display did not show creativity or originality.	☐ The project is interesting, but not original or creative. ☐ The content in the display is good but not creative	☐ The project is original and/or creative. ☐ The content is displayed in a creative way.	____ /5 pts.
Thoroughness	☐ Many of the project components are missing. ☐ The report did not explain the conclusion or mention the hypothesis again.	☐ Most of the project components are complete. ☐ The report has a conclusion, but doesn't mention if the hypothesis was correct or incorrect.	☐ All project components are complete and explained. ☐ The report tells you whether the hypothesis was correct or incorrect.	____ /5 pts.
Skill	☐ The project seemed too easy to complete for the grade level.	☐ The skills required for the project are what is expected at this grade level.	☐ The project seems like it involved more skill to complete than other projects.	____ /5 pts.
Clarity & Neatness	☐ The display is not neat & organized. ☐ Findings were not mentioned.	☐ The display is somewhat neat & organized. ☐ Findings are incomplete.	☐ The display is neat & organized. ☐ Project findings are well explained.	____ /5 pts.
Real World Connection	☐ Career/real-life connections were not mentioned.	☐ A career/real-life application was somewhat explained.	☐ There is a clear connection to a real-life application and/or career.	____ /5 pts.

Project number: _____ Total Points awarded out of 30 points possible ____ /30

Animal Subjects Approval Form

School: _____ Today's date: _____/_____/_____

Coordinator: _____ Work email: _____

Teacher: _____ Work Email: _____

Parent: _____ Email: _____

Student: _____ Grade level: _____

Project Title: _____ ☐ Math ☐ Science ☐ STEM

Type: ☐ Class ☐ Individual ☐ Team ☐ Digital **Category:** ☐ Access ☐ Regular ☐ Dual Language ☐ Gifted

Type of animal(s) being tested _____ How many? _____

Where will this experiment be done? _____

Start date: ___ /___/____ End date: ___ /___ /_____ Adult supervisor _____

Describe the normal diet of the animal(s) _____

Describe the housing and care of the animal(s) _____

What will happen to the animal(s) when the experiment ends? _____

_____ *(add more pages if needed)*

Purpose:

Hypothesis: *(expected result)*

Materials/Tools: *(equipment used)*

Procedure: *(Describe the activities with the animal, any equipment being used, safety precautions, adult oversight)*

Student _____

Parent _____ Teacher _____

I have reviewed this and give my consent *I have discussed my concerns with the student*

Coordinator _____ **Date ___/___/_____**

I have reviewed and approved with these conditions

APPROVED when the following is completed

- ☐ Parent signs their consent
- ☐ Teacher gives their permission
- ☐ Coordinator has forms on file at the school

NOT APPROVED because

- ☐ Unsafe procedure
- ☐ Needs the parents signed consent
- ☐ Needs veterinarian approval*

* Veterinarian's signature _____ Date _____/_____/_____

HUMAN SUBJECTS APPROVAL FORM

School: _____ Today's date: _____/_____/_____

Coordinator: _____ Work email: _____

Teacher: _____ Work email: _____

Parent: _____ Email: _____

Student: _____ Grade level: _____

Project Title: _____ ☐ Math ☐ Science ☐ STEM

Type: ☐ Class ☐ Individual ☐ Team ☐ Digital **Category:** ☐ Access ☐ Regular ☐ Dual Language ☐ Gifted

How many test subjects are needed? _____ What ages? _____

Where will this experiment be done? _____

Start date: ___ /___/____ End date: ___ /___ /_____ Adult supervisor _____

Describe everything ingested or inhaled.

Describe any physical activity involving the test subjects.

☐ I have attached any surveys or questionnaires I will be using. *(add extra pages if needed)*

Purpose:

Hypothesis: *(expected result)*

Materials: *(include any food, drink, or items to smell, touch, taste or eat)*

Procedure: *(describe all activities with test subjects, how materials and equipment are used, any safety precautions, instructions, and adult oversight)*

Student _____

Parent _____ Teacher _____

I have reviewed this and give my consent and supervision *I have reviewed and discussed any concerns with the student*

Coordinator _____ **Date ___/___/_____**

I have reviewed and approve with these conditions

APPROVED only when the following is completed

☐ All parent have signed their consent
☐ All test subjects have signed their assent
☐ Coordinator has all forms on file at school

NOT APPROVED because

☐ unsafe/inhumane procedure
☐ not signed by the student
☐ not signed by the parent

Informed Consent/Assent Form

Instructions This Informed Consent/Assent Form should be completed by the parent/guardian (**P/G**), student (**S**) and classroom teacher (**T**) with help from the School Fair coordinator if needed. It should provide information to every subject (adult or child) about every experiment they participate in and serves as written, informed consent by the parent, and minor assent permission for the child to participate.

- The signed, original Informed Consent/Assent permission/forms are kept by the student.
- They are verified by the classroom teacher *(signature on this form)* when the project is turned in. *(by matching one permission to each participant's recorded data)*
- This form and the original **Human Subject Approval** form are kept by the classroom teacher.

I am asking you to volunteer to participate in my School Fair project. Please read the information below about what I will ask you to do. If you would like to participate, please sign the bottom of this form for me to keep.

The purpose of my project is -

You will be asked to -

The time it will take you to participate is -

The risks to you are -

The benefits to you are -

I will maintain your confidentiality by -

Describe everything ingested or inhaled-

Describe any physical activity involved-

Participation in my investigation is completely voluntary. If you decide not to participate there will not be any negative consequences. Please be aware that if you decide to participate, you may stop at any time or decide not to answer any specific questions

STUDENT ASSENT: *I* _____ *agree to participate.*

PARENT **CONSENT:** *I* _____ *give my child permission to participate.*

CLASSROOM TEACHER: *I* _____ *confirm all participants have permission .*

APPROVED with the following is complete

- ☐ Parent signs their consent
- ☐ Every student signs their assent
- ☐ Coordinator have all forms on file at the school

NOT APPROVED

- ☐ No Human Subject Approval Form
- ☐ Unsigned Informed Consent or Assent Form
- ☐ No confirmation participants have permission

English Translation Form

School coordinators must translate any foreign language project information into English. Tape this Translation Form over the Purpose on the project display board. You may add additional pages if needed.

Purpose/Problem/Question:

Hypothesis/Conjecture/Explore:

STEM Design/Plan *(can be attached)*

Materials

Procedure/Create *(add additional pages if needed)*

Improve/Test

Data Table: *(**attach** data table, any recorded observations, drawings and/or graphs.)*

Relation to Mathematics: *(required on math projects)*

Conclusion/Share:

Real World Connections:

