Student and Parent Information Packet

St. Joseph's Regional Catholic School STEM Fair Project Requirements

For students enrolled in grades 7 and 8

Dear St. Joseph's Parents,

This information packet is to help your student prepare for a significant event in their STEM Fair learning experience—the Inquiry-Based Science Project. This project meets the Next Generation Science Standards and the ADW Grade Level Expectations (GREs) for your students and helps prepare them for projects they will be required to do in middle and high school. It is our goal at St. Joseph's to prepare our children to be successful in their academic careers, meet ADW requirements for science, and enjoy the investigative nature of science. It is to these ends that the STEM Fair was designed.

Parent Project Involvement during the project:

- Safety and supplies—please make sure that you are aware and present for specific safety needs your student may have for this project.
- Support and Transport—if the student requests your assistance for observation or transportation (or experimentation), please comply with their specifications—but let them do the work. **They will be graded on this project.**
- Documentation and Congratulations—Please take many videos, photos and send them to others in your family. This is a great event! Enjoy your children.

STEM Fair Timeline:

1. Submit the "My rough idea of what I want to do for the STEM Fair" handout to your child's teacher **by January 6.**
    a. **Please wait for approval BEFORE starting the activity**. If the proposal is denied, please resubmit another proposal by **January 10.**

2. **8th grade students ONLY:** Complete the STEM Fair work packet and submit to your Science teacher.
3. Submit the Science Fair display board by **February 24.**
4. Present your experiment in the STEM Fair on **March 4** between 2:10 – 3:10 pm.

STEM Fair Guidelines on March 4, 2020:

1. Please keep the main focus on the student scientists by socializing outsize the multipurpose room.
2. Middle school students will begin with presentations between 1:10 – 2:10 pm followed by students enrolled in grades 2-5 between 2:10 – 3:10 pm.
3. Keep small children in check—it is a safety issue and shows respect.
4. When viewing student work and listening to a presentation, be respectful and attentive listeners to that student.
5. Ask appropriate questions and give supportive statements.
6. Ask students' permission to film or photograph their work.
7. Walk in a respectful manner and view many projects.

The following pages are a working document: Your student is to talk with you about what they want to do for their project. This is the initial phase and very important. At the bottom, there will be a place for your signature showing me that you received this packet, listened, and talked with your child about the STEM Fair.

- All Students May Choose Their Own Investigation, however, 8th grade students- projects are limited to topics covered in Biology. For 8th grade students, please complete the STEM Fair work packet and submit to your 8th grade teacher.
  - This is the foundation of Inquiry-Based Scientific Investigation.
  - By choosing to study, test, and present something that they are interested in, they are owners for their project and encourages creative and individual, authentic investigations.

- This allows us to assess the individual student's understanding of the process of inquiry, study, conclusions, and new questions.
- STEM Fair Projects must be something that the student has designed as a result of a question they wish to investigate; it is not to be a project that comes from a book, a kit, the Internet, or previous student work.
- Because of this, it is very important that teachers, parents, and peers accept and listen carefully to the student's ideas and give positive feedback to their efforts. This is a learning exercise as well as a graded demonstration, **not a competition**.
- All safety and ethical restrictions apply:
    - One Variable tested—ONLY!
    - All live animals must be treated with respect and care. Any experiment that may hurt or injure an animal will be denied. No live animals may be brought to the STEM Fair.
    - All investigations must be conducted in a safe manner.
    - No use of bodily fluids in the investigation.
    - No use of harmful chemicals, explosives, or corrosives may be brought for the STEM Fair.
    - Motorized units or catapults may be brought for display only, but not exhibition during public STEM Fair viewing.
    - All adult involvement must be in the form of safety, supervision, transportation, guided subject for study (guinea pig), or heavy lifting/high reach assistance only.
    - Only the student may present their findings at the STEM Fair. No coaching during the presentation.
- All Display Boards are standard 36" x 48" Trif-fold Units. Please refer to the diagram of the board as a reference.
    - The display boards must be the tri-fold, standard 36" x 48" Display Boards. There is a specific reason that this project requires standard display boards—students may decorate their boards to enhance the project, but they must remain the same

St. Joseph's Regional Catholic STEM Fair- March 4

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TITLE

STUDENT NAME

QUESTION

HYPOTHESIS

Project History

(How did you decide on this project?)

RESOURCES AND BIBLIOGRAPHY

MATERIALS

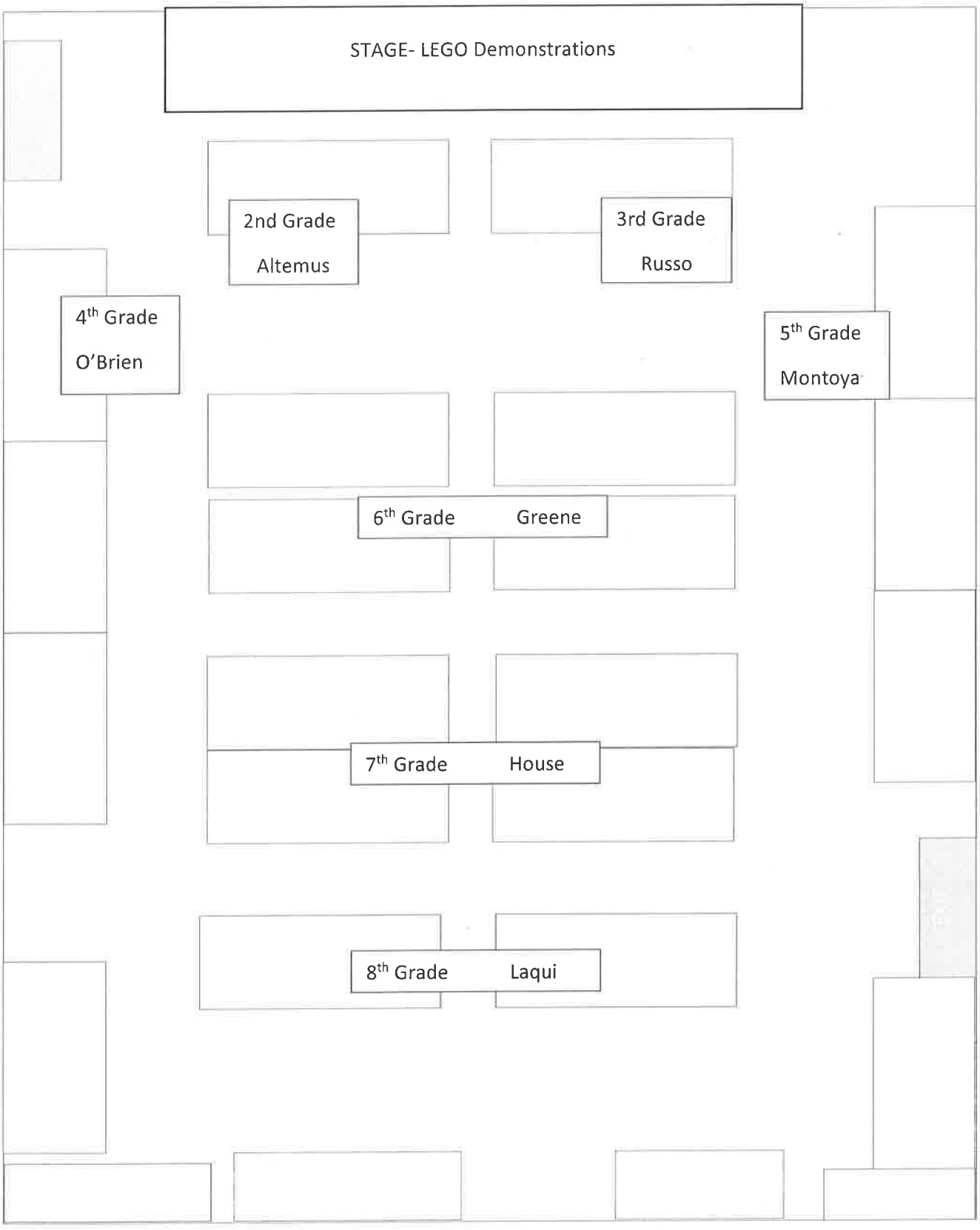
PROCEDURE

DATA ANALYSIS (Graphs & Charts)

CONCLUSION AND NEW QUESTIONS

dimensions. There will be a small space in front of the boards on the table for demonstrations, journals, models or samples of the investigation.

- Each board must have all components of the investigation according to the STEM Fair Rubric to which it will be graded. (Attached and grade-level specific.)
- The student must also attach the rubric to the back of the completed project and make sure that it has their name on both the scoring sheet and on the front of the project.
- Creativity is encouraged in making the presentation attractive, but everything must be contained on the board in the same format in order to assess the student's understanding of the process—and be project-specific. Decorations must make sense.
- The student's grade will be on their understanding of how to apply inquiry-based investigations to something they have an interest in knowing. A STEM Fair project is not a "report."
- Please do not bring a soda & vinegar volcano to the STEM Fair. Your student will tell you why it is not considered an inquiry-based investigation.
- All projects are documented and approved through the teachers or science teacher prior to beginning the projects to make sure that the investigation they have chosen can be SAFELY tested, measured, and contained within STEM Fair guidelines.
- Students must stand beside their project for 60 minutes and discuss their project March 4 between 1:10 – 2:10 pm. Each presentation of your project should last, at maximum, 3 minutes. Time is provided for students to ask questions to the investigator. The audience is to be attentive and supportive of their presentations. Give them your full attention.
- After their 60 minutes are completed, they are to visit at least three other projects and demonstrate how to be respectful listeners and supportive peers.
- Students and parents are encouraged to visit other presentations and offer appropriate remarks or questions.
- Nothing should take away from the student's work—this is their time to shine.


STAGE- LEGO Demonstrations
2nd Grade
Altemus
3rd Grade
Russo
4th Grade
O'Brien
5th Grade
Montoya
6th Grade
Greene
7th Grade
House
8th Grade
Laqui

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MY ROUGH IDEA OF WHAT I WANT TO DO FOR THE STEM FAIR

Your Testable Question (Problem)
Your Hypothesis (If.....Then... Statement)
Independent Variable (What you are purposely changing?) Dependent Variable (What are you measuring?)
Controlled Variables (What stays the same during the experiment?)

Parents: Please sign below. If you have a question or comment you can write them here or send me an email. This is due to your child's teacher before or on **January 6**. Please wait for approval BEFORE starting. All boards must be submitted to your child's teacher by **February 24** and the STEM Fair will be held on **March 4**.

Parents:_____Date:_____

Students:_____Date:_____

STEM Fair Scoring Rubric

Securely tape or staple this to the back of your project

Name_____

Teacher_____

Science Expectations	**Beginning 1**	**Developing 2**	**Accomplished 3**	**Exemplary 4**	**Score**
Display Board to Science Fair Format Guidelines	Has a display board but does not give any information about what the project is about.	Gives little information, some parts missing or items not securely attached, **not displayed according to Science Fair format**	Most information posted in an organized or understandable **arrangement of display according to Science Fair format**	All information required on the board in an organized and **understandable display according to Science Fair format**	
Presentation	Did not present project to anyone.	Answered questions during Science Fair presentation	Presented an understanding of the display, tests, and results.	Clearly presented a complete understanding of the project, display, and test results.	
Research and Bibliography	Does not tell where information for this project came from.	Partial list of names for people, books, and websites where information was obtained.	Lists all books, Internet sites, people, and printed matter used for this project posted on board.	Lists all books, Internet sites, and sources in bibliographical format and posted on board.	
Question and Hypothesis	No Question	Has a question or hypothesis somewhat related to the project.	Asks a question or states a hypothesis with direct testing methods for this project. Written using an "if, then, because" statement.	Developed and designed by the student from his/her own environment. Question and hypothesis directly addresses project's testing. Written using an "if, then, because" statement.	

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Procedures for Testing and Safety	Not sequential, most steps missing or confusing. No safety procedures.	Some of the steps are understandable; most are confusing and lack safety procedures.	Most of the steps are understandable; **Must include Safety Procedures**	Steps are sequential, logical, & adequately detailed. **Complete Safety Procedures**	
Data table or Graph and Test Results	No data or test results	Incomplete, some inaccuracies and/or illegible graphs or tables.	Contains data & test results, and shows them in graphs or tables.	Complete test results, data table or graph accurate and neatly printed all provided.	
Conclusion and New Questions	No conclusions or new questions.	Displays an illogical explanation for findings and addresses a few of the project's test.	Displays a logical explanation for findings and addresses most of the tests in the project. Includes new questions.	Displays a logical explanation for findings and addresses all of the tests in the project and includes new questions.	
Grammar & Spelling	Frequent grammar and/or spelling errors.	More than ten spelling and grammar errors.	More than five spelling and grammar errors.	All grammar and spelling are correct.	
Graphic Display of information	Illegible writing, pieces not well secured onto the display board.	Legible writing, some ill-formed letters, display items are loose or items not functioning.	Legible writing, well-formed characters clean and neatly arranged, all items secure & functioning.	Outstanding Graphics, Artistically presented, all items secure, functioning and **Project Specific.**	
Due Date	After February 27	February 26 (2 days late)	February 25 (1 day late)	February 24	
				Total	

I (print your name)_____ declare that this project is my own work and created for the STEM Fair.

Signed:_____

Steps of The Scientific Method

The idea behind a science project is to discover "what happens if...?" What happens to one thing if you change something else?

The Question

Your science fair project starts with a question. This might be based on an observation you have made or a particular topic that interests you. Think what you hope to discover during your investigation, what question would you like to answer? Your question needs to be about something you can measure and will typically start with words such as what, when, where, how or why. Your research question is what you hope to figure out. It is your "what if" question. You should be able to write the research question in a simple sentence. For example, "What happens to seeds if they are kept at different temperatures before they are planted?

Background Research

Talk to your science teacher and use resources such as books and the Internet to perform background research on your question. Gathering information now will help prepare you for the next step in the Scientific Method.

Hypothesis

Using your background research and current knowledge, make an educated guess that answers your question. Your hypothesis should be a simple statement that expresses what you think will happen. Write your statements using an "if, then, because." "If... then...because" statement in a hypothesis tells the readers what you believe will happen in an investigation when something is changed, so you can see the effect of the change.

- IF...tells the readers what will be changed. This is the manipulated (independent) variable in the investigation.
- THEN... tells the reader what will happen because of the change (manipulated variable) described in the If... statement. This is the responding (dependent) variable in the investigation.
- BECAUSE... tells the reader how you know this will occur. It should be based on something you have experienced, or perhaps something you infer.
    - Example:
        - If 7th graders and 8th graders complete the same math problems, then the 8th graders will have more answers correct, because they have studied math for one year longer than the 7th graders.

Procedure

The procedure is the plan for how you will conduct your experiment. Here are some things to think about:

- An experiment can only have one variable. That is, you can change only one condition in each experiment. For example, with the seed experiment, the variable is the temperature at which the seeds are kept before you plant them. Keep each group of seeds at that temperature for the same amount of time. Also make sure that all the seeds get the same amount of light and water after you plant them.
- How long will your experiment take? If you only have a few weeks to do your experiment, decide on a procedure that you can carry out in that time.
- Consider your "sample size." How many seeds will you test at each temperature? Allow a big enough sample so that you can have a few duds in each group.

Once you decide on a procedure, write it down step by step. That way, you can prove what you did and can follow the same procedure if you need to repeat the experiment.

Experiment

Create a step by step procedure and conduct an experiment that tests your hypothesis. Repeat the experiment a number of times to ensure your original results weren't an accident.

Results

Results are the data, or information, that you collected. Collect data and record the progress of your experiment. Document your results with detailed measurements, descriptions and observations in the form of notes, journal entries, photos, charts and graphs. Your data should be in numbers. For example, let's say that some of your plants grew 1 centimeter the first week. Don't just write that the plants "look bigger"; write down exactly how much they grew.

Observations

Describe the observations you made during your experiment. Include information that could have affected your results such as errors, environmental factors and unexpected surprises.

Conclusions

The conclusion is what you learned from doing the experiment. You might also think of the conclusion as a summary. In just a few sentences, your conclusion explains what happened in your experiment and whether it supported your hypothesis.

Analyze the data you collected and summarize your results in written form. Use your analysis to answer your original question, do the results of your experiment support or oppose your hypothesis. What if your results do not support your hypothesis? That is perfectly fine. You're not out to "prove" your hypothesis but to test it. Think along the lines of "here's what I thought was going to happen, and here's what actually happened." Then go on to explain why you think things happened the way they did.

Communication

Present your findings in an appropriate form- a display board for a science fair competition.