

# Holy Name of Mary STEM Fair

All students in grades 5 through 8 will participate in our annual STEM Fair. The STEM Fair will be held on **Wednesday, March 5, 2020**. Judging will take place during the afternoon and parents are invited to share in the **Awards Ceremony at 7:00PM**.

Criteria for all submissions:

- ★ All students in grades 5, 6, 7, & 8 are to design a STEM prototype as listed in the attached Diocesan Guidelines.
- ★ Students may work in **teams of two** or they may work alone. **Partners must be in the same grade.**
- ★ All projects must be completed at home.
- ★ A scoring rubric and timeline with due dates for each step are attached for each student.
- ★ The steps of the project must be presented on a tri-fold board.
- ★ The prototype must be free standing and fit within the area of the tri-fold board.
- ★ **A portfolio, in the form of a binder(½ inch to 1 inch),** is required to be on display for the judges and public viewing.
- ★ The portfolio should answer the questions associated with each phase of the project (see STEM Design Approach attachment) in chronological order and addendum. In

addition, it should contain research, sketches, drawing, worksheets, photographs, etc. used in creating the project.

- ★ The boards and portfolio should be professional in appearance; handwritten or messy boards are not acceptable. Spelling and grammar should be checked.

### Grading Process

- **All projects are due to your child's Science teacher on Monday, February 24, 2020. All late projects will not be considered for judging in the STEM Fair.** Preliminary judging will take place in the classroom based on the grading rubric. Points will be deducted every day that the project is late.
- The completed project will be part of your 2nd Trimester Science grade.
- All projects will be displayed at the STEM Fair, however, only those which meet the criteria for the final competition will be judged by outside judges.
- A First, Second, and Third place winner will be announced from each Science class.
- Students will be required to speak and answer questions about their project.

**If you have any additional questions about the STEM Fair, please direct your questions to Mrs. Powell or Miss Austin.**

## 2020 Diocesan STEM Fair

| Scoring Rubric   |  | Possible Points |           |
|--|--|-----------------|-----------|
| <b>Identify a Problem</b> <ul style="list-style-type: none"> <li>Student(s) state a specific need.</li> <li>The design goal is clearly stated.</li> <li>Student(s)' statement reflects the reason the problem was selected.</li> <li>The statement identifies the prototype to be developed.</li> <li>Student(s) states the importance of this problem and goal.</li> </ul>  |  | 10              | Dec. 11th |
| <b>Research the problem</b> <ul style="list-style-type: none"> <li>Student(s) provide a thorough, researched background that addresses all important facets of the problem.</li> <li>Research shows how the goals meet the need presented.</li> <li>A "Works Cited" page giving credit to resources used is included.</li> </ul>   |  | 10              | Dec 18th  |
| <b>Develop Possible Design Solutions</b> <ol style="list-style-type: none"> <li>Student(s) select three possible solutions to the problem. Student(s) determine and present the merits and faults of each solution. Each solution is described, listing the pros and cons. (5)</li> <li>Student(s) select one design (out of the three) that best solves the identified problem. An in-depth explanation of why this solution was selected is included (5)</li> <li>Sketches must be included showing the solution. Notes identifying materials along with dimensions should be included. A minimum of two views (aerial and side) must be incorporated in the sketches. (5)</li> <li>Criteria must list the constraints the design solution must meet to be an appropriate solution. (5)</li> </ol> |  | 20              | Jan. 8th  |
| <b>Select the Most Promising Solution</b> <ul style="list-style-type: none"> <li>Student(s) explain why the design was selected and how the solution meets the identified problem</li> </ul>   |  | 10              | Jan. 15th |
| <b>Construct a Prototype</b> <ul style="list-style-type: none"> <li>Student(s) construct a prototype addressing the need presented.</li> <li>An explanation of why this prototype was selected is included.</li> </ul>   |  | 15              | Jan. 29th |
| <b>Test and Evaluate the Prototype</b> <ul style="list-style-type: none"> <li>Students have developed a test plan to evaluate how their prototype addresses and solves the problem selected.</li> <li>Students have recorded observations during testing.</li> </ul>   |  | 10              | Feb. 5th  |
| <b>Redesign</b> <ul style="list-style-type: none"> <li>If necessary, student(s) describe any adjustments that were made while testing the prototype.</li> <li>Student(s) must be able to explain how the adjustments improved the outcome.</li> </ul>  |  | 10              | Feb. 12th |
| <b>Communicate the Final Design</b> <ul style="list-style-type: none"> <li>The final presentation shows how the prototype meets the identified problem.</li> <li>The presentation board submitted by the student(s) is neatly typed, grammatically correct, and represents the work of the student(s).</li> <li>The oral presentation is clear and easy for the audience to understand.</li> <li>A portfolio answering the questions associated with each step is included.</li> </ul>   |  | 15              | Feb. 24th |
| <b>Total Points</b>  |  | 100             |           |



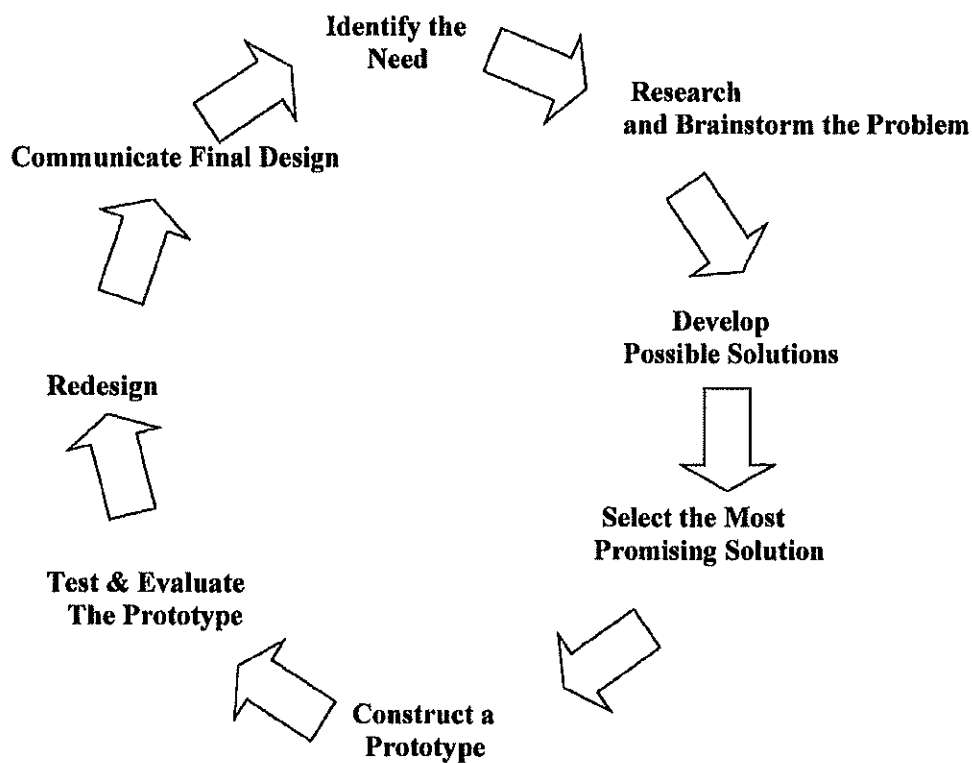
## 2020 Diocesan STEM Fair STEM Design Approach

Team Members: 1. \_\_\_\_\_ Grade \_\_\_\_\_  
2. \_\_\_\_\_

Start Date: \_\_\_\_\_

End Date: \_\_\_\_\_

### STEM Design Loop



**Students will construct a design portfolio that contains the following:**

**Phase 1: Identify a Need**

Explain the need you have identified, why you have selected it, and why it is important.

**Phase 2: Research the Problem**

Through research, explain what you were able to discover about the identified need selected.

**Phase 3: Develop Possible Solutions**

There are four parts to this section:

**1. Brainstorm Possible Solutions:**

Brainstorm possible solutions. Afterward, explain the merits and faults of each idea, select three possible solutions, and describe them.

**2. Design solutions:**

Decide on one design that you feel will solve your identified need. Explain why you selected this particular design solution.

**3. Sketches:**

Create freehand sketches of your two best design solutions. Be sure to add notes identifying materials and dimensions and other important information. Try to show what the design solution will look like from at least two views, aerial and side.

**4. Criteria:**

In your own words, list the constraints your design solution must stay within to be an appropriate solution.

**Phase 4: Select the Most Promising Solution**

Select the most promising solution to the identified need and explain why you selected this design.

**Phase 5: Construct a Prototype**

A prototype is a model of the finished product. It is important that you keep in mind that the prototype should be easily transported to the STEM Fair.

**Phase 6: Test and Evaluate the Prototype**

Did your prototype solve your identified need? Explain what happened during the testing phase.

**Phase 7: Redesign**

After testing, what adjustments had to be made to your design? Describe the adjustments and explain how the adjustments solved the problem.

**Phase 8: Communicate the Design**

Explain why you chose the final design of your prototype and how it solved the identified need. If you feel it requires further testing, explain why.

## **Addendum**

### **Bibliography:**

Site all sources that were used in your research.

### **Resources of Technology:**

Give one example of how each of the six resources of technology is used in your design solution.

**People:**

**Energy:**

**Tools/Machines:**

**Materials:**

**Information:**

**Time:**