S.T.E.M. Fair News

January 7, 2015

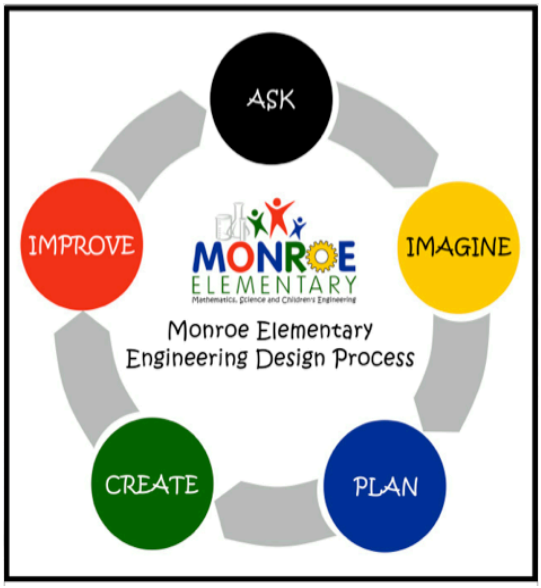
Science, Technology, Engineering, and Mathematics (S.T.E.M.) K-5 Fair

STEM Fairs give students the opportunity to explore a topic within the Science, Technology, Engineering or Mathematics themes. There are many different types of STEM Fair projects. The projects can fall within any of the STEM themes but must follow a process that will produce measureable results. Students in Kindergarten through 2nd grade will be working on a classroom project, getting them familiar with the process. Students in 3rd grade will work with a small group to answer a classroom generated question. Students in 4th and 5th grade will be focusing on a technology. They will complete research on the history of a certain technology, review what that technology looks like today and design what this technology could look like in the future.

Need some ideas???

Science and Math Projects

A science or math STEM project may follow a process similar to the following. The beginning might be the most difficult for students, which is deciding on an idea and creating a question. Here are some helpful guidelines that can be followed when students are creating their STEM Fair display board. First, make some **observations** about their daily life and routines. These observations can lead to **questions.** For example, I noticed some of my plants seem healthier than other plants in my home. This led me to generate the question: *How does the amount of water affect the growth of the plant?* This could be a great STEM Fair question. Great question starters often are: "How does _____ affect _____?" And "How can _____ compare to _____?" Next research the topic. What **materials** will I need to answer my questions and what **procedures** will I follow? In Science, often times we are making **predictions** about what we think will happen. After the prediction this leads to planning and conducting the **experiment.** This is the important part! Make sure the experiment is done in a controlled environment focusing on testing ONE variable. For example, in the question *How does the amount of water affect the growth of the plant?* I would make sure I have the same seeds, same amount of soil in the same containers and kept in the same location of my home, changing only the amount of water I give to the seeds. I would create a table or graph and **record the data** as I water the plants over the course of 10 days. I would then have to **analyze the data** and make a **conclusion** based on my results. The very last thing I might want to add is **I wonder…** Were there parts of my experiment that led me to generate more questions?



Monroe Engineering Design Process

ASK: Identify the problem

IMAGINE: Brainstorm ideas and draw sketches

PLAN: Illustration with labels, and detailed material list

CREATE: Build the design. Test the design and measure the success

IMPROVE: Focus on the weaknesses and make it better

What would the process look like for an engineering project?

For students who are thinking about doing an engineering or technology project the process might be a little different. Students would follow the Monroe Engineering Design Process.

The first step of the engineering design process is **ASK**. This is where students might identify a problem. For example, I noticed at home my two-year-old son has figured out how to get into the treat drawer in the kitchen. I would ASK 'How can I prevent children from getting into kitchen cupboards?'. The next step is to **IMAGINE**. In this step you think of ideas or brainstorm ways to solve your problem. This might include a variety of sketches including labels and a brainstorm of materials that might work in the design for solving the problem. In my example I might design some sort of child lock for my kitchen cupboards. From there a **PLAN** is created. This is detailed materials list. Now that the PLAN is done, it is time to **CREATE**. In this step you would build your design with the materials from your plan. You could include pictures of the outcome on your display board under this heading. In this step you also **TEST** your design. Make sure your test is measureable some how. You should not just say it is good or it worked, but include the strengths, weaknesses, etc. of your design. From here this can lead you to **IMPROVE**. Engineers are constantly improving their designs to make them the best they can be. Now, improving doesn't mean you start over from scratch. Instead focus on the weaknesses from the test and try to make those better. You might also include a new plan or materials list for your improved design. Show pictures under your display heading on how you improved your design. Last, does this lead you to any **I wonder**… statements?

How would a STEM Fair display board look?

Sample Science or Mathematics display heading:

Question	**Title**	**Vocabulary**
	Prediction	
Materials		**Conclusion**
	Results	
Procedure	**(data that measured the success goes here)**	**I wonder…**

Sample Engineering or Technology display headings:

Ask	**Title**	**Improve**
Imagine	**Plan**	**I wonder…**
	Create & Test	
	(Data that measured the success goes here)	

The maximum display board size is:

30" deep

48" wide

72" high

Students can register as an individual, as a group of two or as a group of three maximum.

If you are interested in participating in this year's STEM Fair please fill out the following form and return to your classroom teacher.