S.P.A.R.K.S. Project STEM Fair

The STEM Fair will *spark* your interest in STEM.

Thank you for signing up for the STEM Fair! We look forward to seeing your amazing projects on Saturday, July 24th from 10:00 AM to 4:00 PM! We have a fun-packed day filled with guest speakers, presenting your projects, an awards ceremony, and some fun STEM activities that everyone can participate in! The event will be on a zoom platform so we can all ensure everyone's safety. Please read below the specific guidelines and rules for this event

Rules:

- One participant per entry in the STEM Fair
    - Working in pairs or a group is not allowed as this is an INDIVIDUAL project.
- Stick to the STEM field you chose to make your project on.
- Your parents CAN'T do your project for you, this project is to show how much YOU know and to show how AWESOME you are at STEM!
- You have to make sure that you UNDERSTAND your topic to the best of your ability. Choose a topic that challenges your ability in a fun and productive way! Don't choose a hard topic that you won't understand, but don't choose one that is too easy; find the best one possible!
- Have fun! This is not about winning but about everyone learning something about STEM and having fun while doing it!

Guidelines:

<u>Criteria for Content: K-2</u>

Presentation and Creativity

- Project must be in the form of a *Google slideshow* or *Powerpoint presentation*
- Include the following slides….
    - Title slide
    - What was your topic?
    - What was your experiment?
    - What materials did you use? - include a list
    - How did you complete your experiment or project?
    - What was the result of your experiment?
    - Why did you choose this topic?
- Include pictures of you conducting your experiment or completing your project in your presentation
- Make your presentation visually appealing by using a color scheme and visual aspects
- The presentation must be neat and organized and no more than 6 minutes in length.
- Be prepared to answer some questions about your project at the end!

Experimental Portion

- Your experiment must include the following….
    - a statement of purpose that includes why you chose the topic. The maximum length of this statement is 5 sentences.
    - A detailed list of materials that includes substitutes if they were used
    - Data from at least three trial runs
    - An analysis of data in 6 sentences that summarizes the results of the experiment. Consider the following guiding points.
        - What were the results of the experiment?
        - Did you have an outlier between the three trials?
        - How are all three trials related?
    - Give a reflection on the experiment by answering the questions….
        - What did you learn?
        - Did this project benefit you?
        - What is one thing you would change about the experiment?
- Make sure the content of the project is thorough and detailed. Although you will be graded on grammar, we are focusing on the content and how much you learned from the project!

<u>Criteria for Content: 3-5</u>

Presentation and Creativity

1. Project must be in the form of a website, physical poster, or google slides presentation
2. Include the following content in your media….
    a. Title slide
    b. What was your topic? What was your hypothesis?
    c. What was your experiment?
    d. What materials did you use? - include a list
    e. How did you complete your experiment or project?
    f. What was the result of your experiment? (optional*- include bar graphs, and charts except for Science and Math)
    g. Reflection of reason you chose the topic (similar to statement of purpose) and what you learned (any new information)
3. Embed pictures of you conducting your experiment or completing your project in your presentation.
4. Make your presentation visually appealing by using a color scheme and visual aspects and is in a structured format. For example, do not provide the hypothesis after you say the results of the experiment because the hypothesis should be the first point you make in the presentation. (order is listed in second bullet point)
5. The presentation must be neat and organized and no more than 10 minutes in length.

6. Be prepared to answer some questions about your project at the end!

Experimental Portion

1. Your experiment must include the following….
    a. a statement of purpose that includes why you chose the topic and a thesis statement. The maximum length of this statement is 6 sentences.
    b. Background information on the topic must be conducted that includes any information the competitor had to research before diving into the experiment
    c. A detailed list of materials that includes substitutes if they were used
    d. Data from at least three trial runs
    e. An analysis of data in at least 12 sentences that summarizes the results of the experiment. Consider the following guiding points.
        i. What were the results of the experiment?
        ii. Did you have an outlier between the three trials?
        iii. How are all three trials related?
    f. Must include any reference data or websites that were used to interpret or make any connection with the competitor's experiment and the information in the media.
    g. Give a conclusion on the experiment by answering the questions….
        i. What did you learn?
        ii. Did this project benefit you?
        iii. What is one thing you would change about the experiment?
        iv. What errors could there have been while conducting the trials?
        v. What is a similar experiment that you could have done to test your hypothesis?
2. Make sure the content of the project is thorough and detailed. Although you will be graded on grammar, we are focusing on the content and how much you learned from the project!

Breakdown of STEM Fields

*The requirements for each field differ, and for more information on each respective requirement, refer above to the Criteria guides and look for the corresponding numbered point.

STEM Field	K-2	3-5
Science	**Prompt:** Create a hypothesis and do an experiment to test that hypothesis. **What you must include in your experiment…**	**Prompt:** Create a hypothesis and do an experiment to test that hypothesis. **What you must include in your experiment…** ● Summarize any research that you

	• Summarize any research that you conducted before the project/ experiment started that you needed to conduct your project/experiment
	• Do the experiment! Include at least 3 trial runs in the experiment
	  ○ Reflect on the trials in 3+ sentences
	• Include a links page for any sources you used
	
	What you must include in your presentation….
	• Title Slide
	  ○ Name, Grade, Stem Field, School
	• Your topic and Hypothesis
	• A brief description on what your experiment/project was
	• List of materials
	• Explain the process for how you conducted the experiment/project
	  ○ Include pictures for evidence!
	• Give a reflection on the experiment and make sure to explain the outcome. Don't forget to add why you chose this topic!
		conducted before the project/experiment started that you needed to conduct your project/experiment.
		• And then, you must do the experiment! You must include at least 3 trial runs in your experiment!
		  ○ Then you must reflect on these trial runs in a 12 sentence or more analysis.
		• Include a sources page of websites or resources that you used to assist you! No MLA citing needed, links or titles are fine.
		
		What you must include in your presentation…
		• Title Slide w/ Name, Grade group, Stem Field, and school.
		• Must include a scientific *hypothesis* AND must state your topic. (i.e a scientific hypothesis is a hypothesis that can be tested). The hypothesis can be a maximum of 4 sentences.
		• Give a brief description of what your experiment/project was.
		• Include a list of materials
		• Explain your process for the experiment/project (this might be a good place to show pictures of you completing your experiment/project!)
		• What happened in your experiment? Explain the outcome. *You must express the results of the trial runs in writing or in a chart.*
		• Lastly, explain why you chose this topic and what you learned.

Technology	**Prompt:** Create a game or a code that serves a purpose! **What you must include in your project…** • Summarize any research that you conducted before the project/ experiment started that you needed to conduct your project/experiment • Do the experiment! • Include a links page for any sources you used	**Promt:** Create a technological device or code that serves a purpose! **What you must include in your project...** • Summarize any research that you conducted before the project/experiment started that you needed to conduct your project/experiment. • And then, you must do the project! *Preferable that you try multiple times to try and get a better design each time. 2-3

	What you must include in your presentation… ● Title Slide ○ Name, Grade, Stem Field, School ● A brief description on what your game/code project was and the purpose it serves ● Explain the process for how you made the game/code ● Include pictures for evidence! ● Give a reflection on why you chose this topic and what you learned!	times is suitable enough. This analysis should take a minimum of 12 sentences. ○ If you had to try multiple times to get the correct design or product, please explain each trial further. ● Include a sources page of websites or resources that you used to assist you! No MLA citing needed, links or titles are fine. **What you must include in your presentation…** ● Title Slide w/ Name, Grade group, Stem Field, and school. ● Must include a thesis that states the purpose for your technological device/code and how you would go about creating this. A maximum of 4 sentences. ● Give a brief description of what your experiment/project was. ● Include a list of materials ● Explain your process for the experiment/project (this might be a good place to show pictures of you completing your experiment/project!) ● What happened in your experiment? Explain the outcome. Did your device work as you imagined? ● Lastly, explain why you chose this topic and what you learned.
Engineering	**Prompt:** Build and design something that models a practical need or problem to be solved. EX: Build a Rube Goldberg Machine that flips a page in a book. **What you must include in your project…** ● Summarize any research that you conducted before the project started that you needed to conduct your project ● Do the project ! ○ If you had to try multiple times to get the correct design or product, please explain why you decided to.	**Prompt:** Build and design something that models a practical need or problem to be solved. EX: Build a Rube Goldberg Machine that flips a page in a book. **What you must include in your project...** ● Summarize any research that you conducted before the project/experiment started that you needed to conduct your project/experiment. ● And then, you must do the project! *Preferable that you try multiple times to try and get a better design each time. 2-3 times is suitable enough. This analysis should take a minimum of 12 sentences. ○ If you had to try multiple times to

	● Include a links page for any sources you used **What you must include in your presentation…** ● Title Slide ○ Name, Grade, Stem Field, School ● A brief description on what your project was and the purpose it serves. ● Explain the process for how you made your project ● Include pictures for evidence! ● Give a reflection on why you chose this topic and what you learned!	get the correct design or product, please explain each trial further. ● Include a sources page of websites or resources that you used to assist you! No MLA citing needed, links or titles are fine. **What you must include in your presentation…** ● Title Slide w/ Name, Grade group, Stem Field, and school. ● Must include your topic AND a thesis which describes your project and how you went about creating it. A maximum of 4 sentences. ● Give a brief description of what your experiment/project was. ● Include a list of materials ● Explain your process for the experiment/project (this might be a good place to show pictures of you completing your experiment/project!) ● What happened in your project? Explain the outcome. Did your project turn out the way you wanted? Did you think it could've been better? If you had multiple attempts, include and describe what happened in each one. ● Lastly, explain why you chose this topic and what you learned.
Math	**Prompt:** Investigate the math that goes into a specific everyday object or process EX: How many seeds there are in an average red apple **What you must include in your project…** ● Summarize any research that you conducted before the project started that you needed to conduct your project ● Do the project ! ○ Explain what you discovered! ● Include a links page for any sources	**Prompt:** Investigate the math that goes into a certain everyday object or process. EX: How many seeds there are in an average red apple **What you must include in your project...** ● Summarize any research that you conducted before the project/experiment started that you needed to conduct your project/experiment. ● And then, you must do the project! *You must create an analysis with a minimum of 12 sentences that explains what you discovered with the project! Did

	you used **What you must include in your presentation…** ● Title Slide ○ Name, Grade, Stem Field, School ● A brief description on what your project was and what you discovered! ● Include pictures for evidence! ● Give a reflection on why you chose this topic and what you learned!	your predictions match up with the results? What mathematical concepts were present in your project? You must include mathematical data or concepts throughout your analysis! ● Include a sources page of websites or resources that you used to assist you! No MLA citing needed, links or titles are fine. **What you must include in your presentation…** ● Title Slide w/ Name, Grade group, Stem Field, and school. ● Must include your topic AND a thesis which describes your project and how you went about investigating it. A maximum of 4 sentences. ● Give a brief description of what your experiment/project was. *Include your predictions on what you thought you might find before you do the project. ● Include a list of materials ● Explain your process for the experiment/project (this might be a good place to show pictures of you completing your experiment/project!) ● What happened in your project? Explain what you found out! DId you find that math plays a huge part in the thing you are investigating? ● Lastly, explain why you chose this topic and what you learned. ● You must include mathematical data or concepts throughout your presentation!