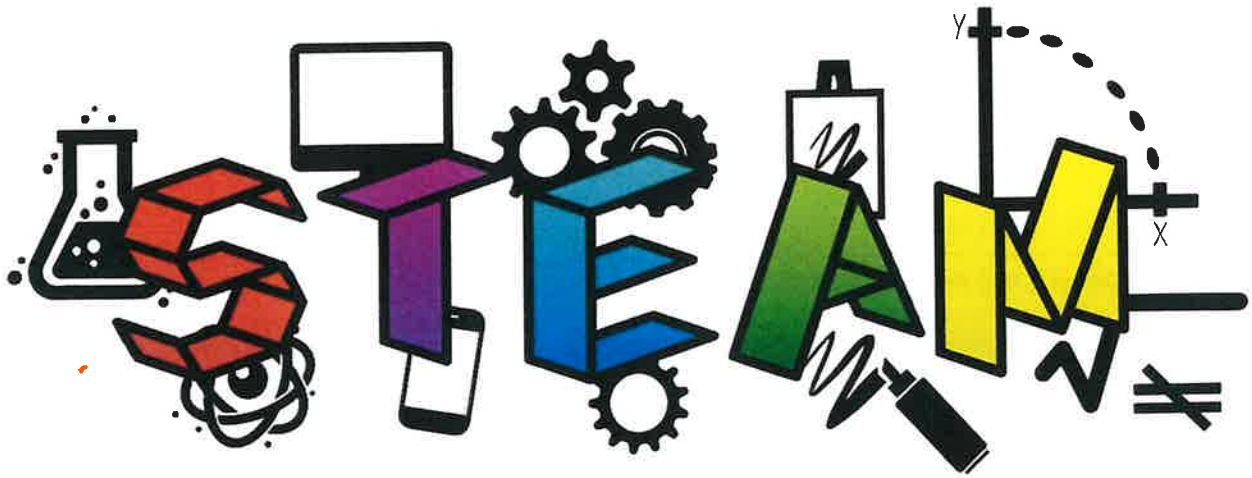


# Heartland Elementary School

## 2024 STEAM Fair

### Informational Packet



#### Important Dates:

- **STEAM Fair Registration** – opens on Monday, November 6<sup>th</sup>, 2023
- **Brief Presentation & Q/A session about the projects at Heartland Elementary School** – Thursday, November 16, 2023, from 6:30 pm to 7:30 pm (LMC)
- **STEAM Fair Registration deadline** - Monday, December 18, 2023
- **STEAM Fair Event** – Thursday, March 21, 2024 (Time TBD)

#### Contact Information:

Stephanie Jones- [stephaniejones9@gmail.com](mailto:stephaniejones9@gmail.com)  
Dr. Juan A. Colón Santana- [jsantana@aurora.edu](mailto:jsantana@aurora.edu)

## STEAM Fair Categories

### Science

The Science category at our STEAM Fair is where students unveil the wonders of the natural world through hands-on experiments, keen observations, and a genuine search for knowledge. Students will explore the fundamental principles of biology, chemistry, physics, and the environment.

#### **Expectations in this category:**

**1. *Scientific Method:***

- Clarity of the research question or hypothesis.
- Thoroughness of the experimental design.
- Use of appropriate controls and variables.
- Data collection methods and accuracy.

**2. *Creativity and Innovation:***

- Uniqueness and originality of the project.
- Innovative solutions or ideas demonstrated.

**3. *Knowledge and Understanding:***

- Demonstrated understanding of scientific principles related to the project.
- Accurate explanation of scientific concepts.

**4. *Data Analysis:***

- Organization and presentation of data in tables, graphs, or charts.
- Interpretation of data to draw meaningful conclusions.

**5. *Presentation and Communication:***

- Clarity and organization of the project display or presentation.
- Effective use of visuals, diagrams, and multimedia.
- Ability to explain the project clearly to judges and visitors.

**6. *Critical Thinking and Problem-Solving:***

- Ability to adapt and make adjustments during the project.
- Demonstrated critical thinking skills in analyzing unexpected results or challenges.

### Examples of potential Science Projects:

1. **Plant Growth Experiment:**
  - Investigate how different factors like light, water, and soil type affect plant growth.
  - Set up a controlled experiment with multiple plants to compare results.
2. **Volcano Eruption:**
  - Create a model volcano using clay and household items.
  - Explore the science behind volcanic eruptions by adding baking soda and vinegar.
3. **Solar System Model:**
  - Build a model of the solar system to learn about the planets and their relative positions.
  - Include facts about each planet in your display.
4. **Food Science:**
  - Explore the science of cooking by conducting experiments like making homemade butter, observing the effects of yeast in bread dough, or studying the properties of various foods.
5. **Insect Study:**
  - Collect and observe insects in your local area.
  - Document their behavior, habitat, and physical characteristics.

### **Judges Evaluation Will Focus on:**

1. **Scientific Method** - Demonstrate a clear understanding and application of the scientific method.
2. **Originality** - Is your project unique when addressing a research question or problem?
3. **Experimental Design** - The appropriateness and rigor of your experimental design or methodology, including the control of variables.
4. **Data Collection and Data Analysis** - the accuracy of data collection, including appropriate measurements and data recording techniques. The quality of data analysis, including statistical methods (if applicable) and graphical representation of results.
5. **Results** - The clarity and accuracy of the results presented and whether they support or refute your hypothesis.
6. **Conclusion** - The strength of your conclusions and their alignment with the research question and hypothesis.
7. **Presentation:** The quality of your display board, visual aids, and oral presentation, including clear communication of your research process and findings.

## **Technology**

This category pertains to the exciting world of technology, where you, our young innovator, will use your imagination to create a game or app using programming languages (Scratch, Blockly, etc.). You can showcase a device or gadget with innovative capabilities, build electronic circuits, or demonstrate applications in robotics. You have the chance to create, design, and demonstrate your very own robot or automated system in ways that suit your best interest.

### **Participant Role:**

As a participant in this category, you will have the opportunity to create, design, or showcase a project from one of the areas below. The participant is expected to:

1. **Electronics and Circuits:**  
Design projects related to electronics, circuitry, and hardware, such as building electronic gadgets, devices, or circuitry to control electric outputs.
2. **Coding and Programming:**  
Showcase a live demonstration of a coding project you developed using programming languages or an app functionality with strong implications for your daily life.
3. **Robotics and Automation:**  
Describe the logistics of building a robot (or creating an automated system) and the impact the robot may have in improving society. You can interactively demonstrate robot functions.
4. **Digital Gadgets and Devices:**  
Present innovative tech gadgets and devices with hands-on demonstrations of device/gadget features.

### **Judges Evaluation Will Focus on:**

1. **Creativity** - Show us your unique and imaginative robot design.
2. **Functionality** - Make sure your robot can perform a specific task or follow a particular path.
3. **Presentation** - Prepare a brief presentation to explain how your robot works and what inspired your creation.
4. **Safety:** Think about the safety of your robot and those around it

## **Engineering**

In this category, you can share your engineering prowess with your peers and judge by designing and building real-world projects. Whether you want to construct a state-of-the-art bridge, craft a model of a futuristic city, or engineer a simple machine, the possibilities are as vast as your imagination.

### **Participant Role:**

As a participant in this category, you will have the opportunity to design, build, or showcase a project from one of the areas below. The participant is expected to:

#### **1. Mechanical Engineering:**

- design and build mechanisms or mechanical devices, such as simple engines or gear systems.
- design and build a model (bridge, building, skyscraper, etc.) using materials like popsicle sticks, toothpicks, or straws using innovative designs.
- construct and test structures like towers, buildings, or earthquake-resistant structures using various materials.

#### **2. Environmental Engineering & Renewable Energy Solutions:**

- create models or prototypes for renewable energy solutions (solar panels, wind turbines, hydroelectric generators, etc.).
- explore energy sources, such as building a mini windmill, solar-powered device, or demonstrating energy conservation.
- create a project that addresses environmental issues, like designing a waste reduction system or a rainwater harvesting solution.

#### **3. Inclusive Engineering:**

- create a project focusing on creating engineering solutions for individuals with disabilities, promoting accessibility and inclusion.

#### **4. Aerospace Engineering:**

- explore concepts related to flight, rockets, or space exploration, building and launching simple rockets or paper airplanes.

There are many engineering disciplines that are not described here. If you have a project or idea in mind that interests you and is not mentioned in this section, please feel free to reach out to [jsantana@aurora.edu](mailto:jsantana@aurora.edu) to confirm the acceptance of the project to the STEAM fair.

### **Judges Evaluation Will Focus on:**

1. **Creativity** - how inventive and original is your engineering project?
2. **Functionality** - your creation performs its intended task effectively.
3. **Problem-Solving** - explain the challenges and obstacles you overcame to complete the project.
4. **Presentation** - explain your project clearly and with enthusiasm.
5. **Safety** - safety precautions you consider in your design and construction.

## **Art**

In this category, you can express yourself through various forms of art, from painting and drawing to sculpture, mixed media, and even digital art. Let your creativity flow as you choose the medium and subject that speaks to your heart. Whether it's a masterpiece on canvas, a sculpture that comes to life, or a digital artwork that pops from the screen, your art is your voice.

### **Participant Role:**

As a participant in this category, you will have the opportunity to create a project from one of the areas below. The participant is expected to:

1. ***Artistic Interpretation of Science Concepts:***
  - Create artwork that creatively interprets scientific ideas, concepts, or phenomena.
  
2. ***Scientific Illustrations:***
  - Present scientifically accurate illustrations and diagrams.
  - Highlight the role of art in communicating complex scientific information.
  
3. ***Digital Art and Multimedia:***
  - Exhibit animations or interactive media to demonstrate how technology enhances artistic expression and scientific illustration.

### **Judges Evaluation Will Focus on:**

1. **Creativity** - How imaginative and original is your artwork.
2. **Technical Skill** - artistic techniques and skills in your work are adequately demonstrated.
3. **Emotional Impact** - your art communicates emotion or meaning.
4. **Presentation** - articulate your artistic choices and inspiration when explaining your work.

## **Mathematics**

In this category, you can explore various aspects of mathematics. Step into the exciting world of numbers, patterns, and problem-solving. Whether it's solving challenging math problems, creating geometric art, presenting data in innovative ways, or demonstrating math-related experiments, you can explore the language of Math.

### **Participant Role:**

As a participant in this category, you will have the opportunity to create a project from one of the areas below. The participant is expected to:

1. ***Math Storybooks***
  - create their own math-themed storybooks.
  - write stories that involve solving math problems, and the illustrations can showcase the math concepts they've learned.
  
2. ***Math in Nature:***
  - take a nature walk and collect data on items you find (e.g., leaves, rocks, or flowers). Then, try and use this data to create bar graphs, pie charts, or line plots.
  
3. ***Measurement Investigation:***
  - explore the properties and dimensions of objects by having them measure and compare length, weight, volume, and capacity. They can create a report or presentation based on their findings.
  
4. ***Math History Research –***
  - Have students research famous mathematicians or key mathematical discoveries and creatively present their findings, such as through posters or presentations.

### **Judges Evaluation Will Focus on:**

1. Creativity - How imaginatively you approach the math-related task or problem.
2. Mathematical Skill - demonstrate a good understanding of mathematical concepts.
3. Problem-Solving - How effectively you tackle math challenges or present solutions.
4. Presentation - explain your project clearly, making math engaging for others.

### **Other STEAM Fields:**

The previous categories can serve as a starting or base point, but participants should feel encouraged to explore interdisciplinary projects that bridge multiple STEAM fields. Below are a few examples:

#### **Geology and Earth Sciences:**

- Rocks and mineral identification.
- Earth's natural processes such as earthquakes and volcanic eruptions.
- Geological Hazards (tsunamis, landslides, hurricanes, etc.)

#### **Astronomy and Space Science:**

- Observations of celestial objects and phenomena.
- Exoplanet research or space exploration technology.
- Studies on the solar system, galaxies, or the universe's origins.
- Space-related experiments or simulations.

#### **Health and Medicine:**

- Medical research on diseases, treatments, or healthcare technology.
- Nutrition and diet studies.
- Anatomy and physiology experiments.
- Health-related apps or wearable technology.

There are many projects that are from STEAM-derived disciplines. If you are interested in a project that was not outlined in this document, please feel free to reach out to Dr. Juan A. Colon Santana at [jsantana@aurora.edu](mailto:jsantana@aurora.edu). Please include the title and briefly describe the project you want to pursue. You should receive a response within 2-3 business days confirming if the project qualifies to be presented at the STEAM Fair.



Heartland  
Elementary School

STEAM FAIR

Thursday, March 21, 2024

STEAM Fair Registration Form  
DUE MONDAY, DECEMBER 18th!!

Student Name: \_\_\_\_\_

Partner Name (Optional)\*: \_\_\_\_\_

*\*May work individually or with a partner- do not need to be in the same grade; 1 form per project*

Project Title: \_\_\_\_\_

Project Category: Please Check

S - Science

T- Technology

E - Engineering

A - Art

M - Math

My child has permission to participate in the HES STEAM Fair on Thursday, March 21, 2024

\_\_\_\_\_  
Parent/Guardian Name

\_\_\_\_\_  
Signature

Email: \_\_\_\_\_

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