

FEBRUARY 21, 2019 - 5:00-8:00 PM

STEMCON 8.0

Canyon View High School
6024 N Perryville Rd, Litchfield Park, AZ 85340



**"We have the
opportunity to create
the future and decide
what that's like."**

**-Mae Jemison
NASA Astronaut**

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For all additional questions, please contact your site representative:

Agua Fria	Mr. Nightingale - Room K4 - pnightingale@aguafria.org
Canyon View	Ms. Ferguson - dferguson@aguafria.org Mr. Jensen - mjensen@aguafria.org Ms. Hudson - ahudson@aguafria.org
Desert Edge	Ms. Payenski - Room C18 - apayenski@aguafria.org
Millennium	Mr. Wirth - Room C209 - dwirth@aguafria.org
Verrado	Mr. Adams - Room E10 - madams@aguafria.org Mr. Carmen - Room D7 - jcarmen@aguafria.org

ABOUT STEMCON 8.0

STEMCon is the opportunity for you to show off your STEM (Science, Technology, Engineering and Mathematics) skills and passions! It's also the opportunity to see cool STEM demonstrations, eat some food, hear from various groups and speakers, enter competitions and win prizes!

You can compete in many STEM competitions including: STEM Inquiry Presentations, STEM quiz/ Quiz Bowl, the cardboard car competition, and many other individual day-of events.

You can also come and hang out and see the amazing vendors, eat from the food trucks, submit projects and talk with STEM professionals about opportunities available in STEM.

There are scholarships up to \$2000.00, gift cards, and other prizes to be won!

MISSION, VISION, & GOALS

STEMCon 8.0 was built on the foundation that all students should have access to the opportunities that STEM careers and fields can hold for them.

Our mission is simple: get our students and community excited about STEM. We believe when that happens, students will see all the doors that can be opened for them in STEM fields.

Our goals are twofold:

1. Get more students excited about STEM and exposed to STEM opportunities.
2. Continue to recognize students for the excellent work they are doing in STEM fields.

COMMUNICATION AND SIGN-UPS

How to Get the Information You Need

1

SIGN UP HERE FIRST!

For all logistics information sign up at the STEMCon 8.0 Google Classroom. Use either of the following codes:

fbwcrlh -or- 56ceo6s

2

Inquiry Project Sign-ups:

Sign-ups for the inquiry projects will be available on the Google Classroom.

3

Cardboard Car Sign-ups:

Please contact the physics teacher at your site to get involved in the cardboard car contest.

4

For all other questions about sign-ups, please contact your site representative (See page 2.)

LIST OF EVENTS & ACTIVITIES

Inquiry-Based Projects

Marie Curie Division

High-level inquiry-based projects.

These are the highest level of projects. Students that submit these projects will be competing for top-level scholarship money.

See page 6 for additional confirmation.

Albert Einstein Division

Open division inquiry-based projects. These can be small group or individual and all projects will be submitted under different themes. Students that submit these projects will be competing for gift cards and other prizes. See page 7 for additional information

QuizBowl and STEM Test

Division A

A test will be taken at 4:30 pm at STEMCon to determine the top 16 scores. The top 16 students will then compete in a QuizBowl style competition on the main stage that night. Topics covered on this test will be physics, chemistry, calculus, AP-level classes, problem solving, computer science, algebra 3, etc. All students are welcome to participate in this division

Division B

A test will be taken at 4:30 pm at STEMCon to determine the top 16 scores. The top 16 students will then compete in a QuizBowl style competition on the main stage that night. Topics covered on this test will be biology, environmental science, conceptual physics, algebra, geometry, computer science, etc. This division is only open to freshmen and sophomores.

LIST OF EVENTS & ACTIVITIES

Cardboard Car Project

The goal for this project is to build a cardboard car which will transport a student from the top of a ramp to the bottom, glide as far as possible across a horizontal surface and obtain the highest score. The team will be composed of 4 members enrolled in the Agua Fria Union High School District. The “driver” of the car must be a team member. See pages 10 - 11 for additional information.

Content-Based Projects

Many of your math and science teachers will provide an opportunity for you to submit a content-based project based on the material that you have been learning in class throughout the year. Please check with your math or science teachers for an opportunity to participate in these unique events as soon as possible!

Vendors and Speakers

There will be a large number of community groups and vendors at the event. Many of them will come with hands-on experiments, demonstrations or activities. We will also have community speakers and groups on the main stage. We had everything from snakes, to giveaways, to robotics demonstrations last year. We look forward to what our community groups will bring this year!

Food Trucks

We will have a variety of food trucks and vendors at the event. Last year we had several food options available as well as a frozen yogurt cart. We hope to have even more options available this year!

INQUIRY PROJECTS

Marie Curie and Albert Einstein Division Basics

MARIE CURIE DIVISION

Project Requirements: (See Pages 8-9)

- Projects must be individual
- Must submit a college-level poster (see page 10)
- All students must be prepared to give a 3 minute verbal summary of their project and answer 2 minutes of questions from a panel of judges.

The top 10-15 projects per school will compete at the actual STEMCon 8.0 event. These will be screened by your school-site teachers before the event. Please see your site representative for additional details and deadline at your school.

These events will be judged by professionals using the Intel ISEF requirements. ([click here](#))

The top Curie Projects from each school will be judged in advance and must be finalized by February 13th. They will be picked up from schools the 14th.

Students with the top 5 projects will present to a panel of judges and will receive prize money and recognition. They will also qualify to compete at the Arizona State Science Fair.

ALBERT EINSTEIN DIVISION

Project Requirements: (See Page 11)

- Projects can be submitted by a group of up to four students
- Projects will be voted on by STEMCon attendees and must submit under one of the following categories:
 - Science and Art-aesthetics
 - Fan Favorite
 - Most Creative
 - Best Community Involvement
 - Most Innovative
 - Most Eco-Friendly/ Green
 - Real World Application
 - Most Interactive

This division is for any student who want to show off their projects but do not want to compete in the Marie Curie Division or whose projects did not receive acceptance into the Marie Curie Division. (A STUDENT'S INQUIRY PROJECT CAN ONLY COMPETE IN ONE DIVISION).

Einstein projects must be finalized by February 13th. They will be picked up from schools the 14th.

MARIE CURIE DIVISION - SCIENCE

Judging Criteria for Science Projects

(Intel ISEF Criteria - [Click here for more information on submitting to the Arizona State Science Fair.](#))

I. Research Question (10 pts)

- ___ clear and focused purpose
- ___ identifies contribution to field of study
- ___ testable using scientific methods

II. Design and Methodology (15 pts)

- ___ well designed plan and data collection methods
- ___ variables and controls defined, appropriate and complete

III. Execution: Data Collection, Analysis and Interpretation (20 pts)

- ___ systematic data collection and analysis
- ___ reproducibility of results
- ___ appropriate application of mathematical and statistical methods
- ___ sufficient data collected to support interpretation and conclusions

IV. Creativity (20 pts)

- ___ project demonstrates significant creativity in one or more of the above criteria

V. Presentation (35 pts)

a. Poster (10 pts)

- ___ logical organization of material
- ___ clarity of graphics and legends
- ___ supporting documentation displayed

b. Interview (25 pts)

- ___ clear, concise, thoughtful responses to questions
- ___ understanding of basic science relevant to project
- ___ understanding interpretation and limitations of results and conclusions
- ___ degree of independence in conducting project
- ___ recognition of potential impact in science, society and/or economics
- ___ quality of ideas for further research
- ___ for team projects, contributions to and understanding of project by all members

MARIE CURIE DIVISION - ENGINEERING

Judging Criteria for Engineering Projects

(Intel ISEF Criteria - [Click here for more information on submitting to the Arizona State Science Fair.](#))

I. Research Problem (10 pts)

- ___ description of a practical need or problem to be solved
- ___ definition of criteria for proposed solution
- ___ explanation of constraints

II. Design and Methodology (15 pts)

- ___ exploration of alternatives to answer need or problem
- ___ identification of a solution
- ___ development of a prototype/model

III. Execution: Construction and Testing (20 pts)

- ___ prototype demonstrates intended design
- ___ prototype has been tested in multiple conditions/trials
- ___ prototype demonstrates engineering skill and completeness

IV. Creativity (20 pts)

- ___ project demonstrates significant creativity in one or more of the above criteria

V. Presentation (35 pts)

a. Poster (10 pts)

- ___ logical organization of material
- ___ clarity of graphics and legends
- ___ supporting documentation displayed

b. Interview (25 pts)

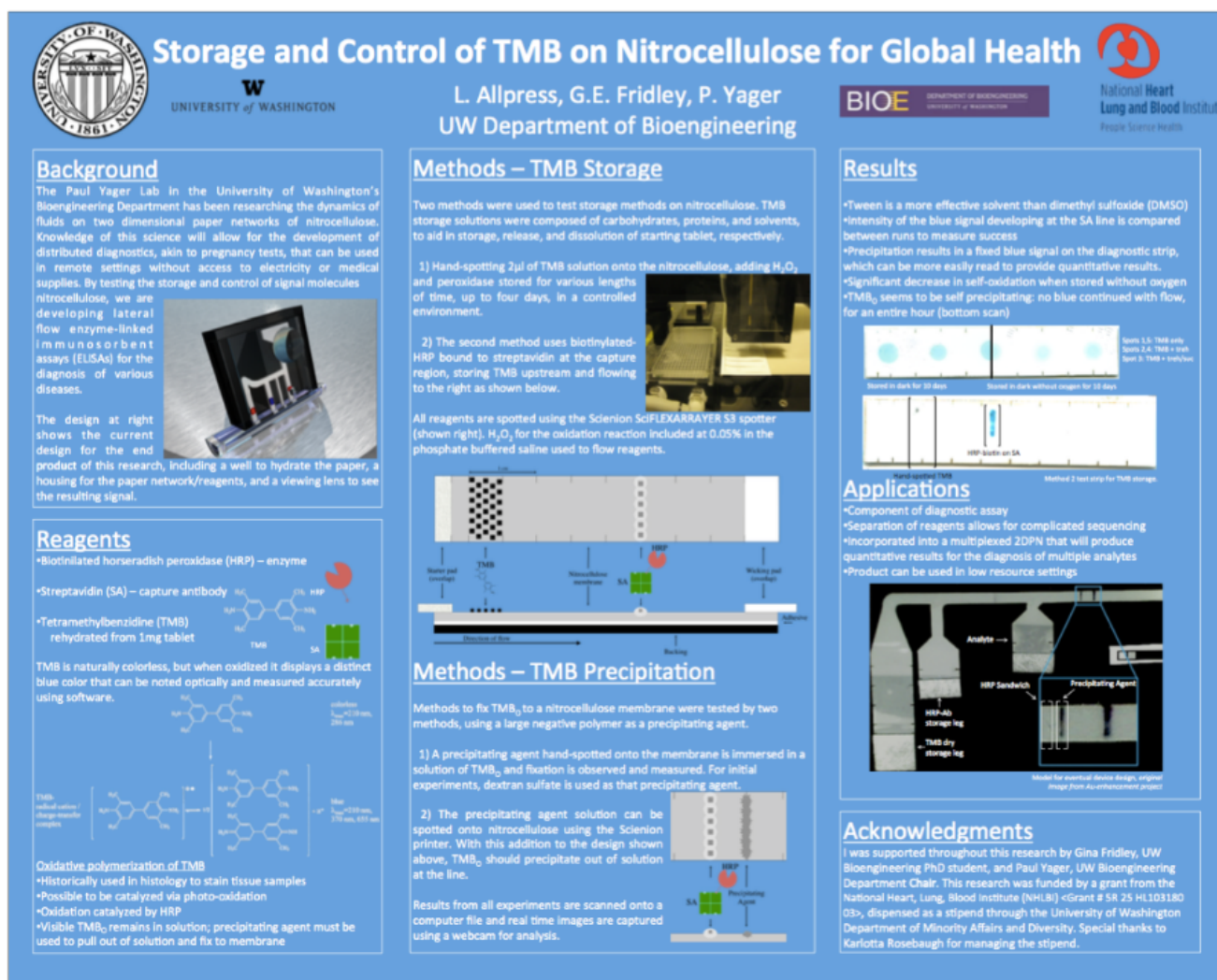
- ___ clear, concise, thoughtful responses to questions
- ___ understanding of basic science relevant to project
- ___ understanding interpretation and limitations of results and conclusions
 - _ degree of independence in conducting project
- ___ recognition of potential impact in science, society and/or economics
- ___ quality of ideas for further research
- ___ for team projects, contributions to and understanding of project by all members

MARIE CURIE DIVISION

Sample Poster for Science and Engineering Projects

All projects that are selected for the Curie Division must present in college-level poster format to be considered for judging. The recommended size for these posters is: 2 ft x 3 ft.

If you are unable to print your poster, please contact your teacher/STEM advisor prior to February 7th to have them print the poster for you.



ALBERT EINSTEIN DIVISION

Categories (Please Select One Category for Your Project to Compete In):

Science and Art-aesthetics
Fan Favorite
Most Creative
Best Involvement with Community

Most Innovative
Most Eco-Friendly/ Green
Real World Application
Most Interactive

Rubric (Expectations for Your Einstein Project)

Content	Expectation
Question/Problem The student has asked a question that can be answered through scientific investigation.	The students' question and hypothesis are reasonable and relevant. Both the students' question and hypothesis reflect a deep knowledge and/or research base.
Application The student ties their investigation to a real-world, current problem/issue	The student's investigation pertains to a current, real-world problem/issue, and proposes a solution to that problem/issue.
Variables The student defines independent, dependent and control variables.	All variables are stated and defined with appropriate units.
Research Intended only to introduce preliminary information about the student's project/topic to the audience.	The student provides five to six pieces of background information/research. The student displays a clear understanding of prior investigations that have led up to their project.
Creative/Critical Thinking The student demonstrates an ability to examine scientific information and apply scientific methods.	The student displays a method of obtaining new information that will further the investigation for scientists in the future.
Communication/ Presentation The student expresses and organizes their ideas, data, materials, and information with effectiveness.	The student effectively communicates seven or more aspects of their investigation. Very few clarifying questions are required.
Data The student uses data to support their investigation	The student displays data and a method for collecting that data. The student describes the next steps for collecting and analyzing their data. The student shows how their data aligns with data from other similar investigations.
Data Processing The student processes the data and determines a mathematical relationship between variables.	The student processes data completely and correctly. A mathematical model is derived correctly and is given with correct variables and units.

CARDBOARD CAR

For Additional Information Click Here

The goal for this project is to build a cardboard car which will transport a student from the top of a ramp to the bottom, glide as far as possible across a horizontal surface and obtain the highest score. The team will be composed of 4 members enrolled in the Agua Fria Union High School District. The “driver” of the car must be a team member. Here are the rules:

- 1.) The car must be made out of corrugated cardboard.
- 2.) The student may only use Elmer's glue or Titebond glue (no yellow carpenter's, hot glue, super glue, gorilla glue, etc.)
- 3.) NO prefabricated round tubes.
- 4.) The car must be safe. Unsafe cars may be disqualified.
- 5.) You may use two ¾ inch x 40 inch dowel. The overall length may not exceed 40 inches.
- 6.) The car must start with release only. No pushes. Car may not be touched or pushed during the run. Student driver may not rock vehicle during run.
- 7.) The car should show good craftsmanship.
- 8.) All team members should be able to explain all aspects of the design to judge upon request.
- 10.) The passenger must be visible at all times. The driver must sit vertically.
- 11.) The car should not lose parts. Lost parts will lower the overall score.
- 12.) Car drivers must wear appropriate safety gear. (bike/motorcycle helmet)
- 13.) The car should be decorated with a STEMCon 8.0 theme. Decorations should not hold the car together.
- 14.) Cars which do not follow criteria 1-6 above may be disqualified.
- 15.) The overall score will be determined as follows:

Criteria	Points Possible
Car is well constructed	10
Car has a STEMCon 8.0 theme.	10
Team members can explain all aspects of design to judges with written explanation	10
Passenger is clearly visible to judges at all times	10
Parts fall off car	-5 pts for each piece that falls off
Violation of rules 1-6 above	-(0 - 50 pts)
Score	$score = \frac{distance\ traveled\ (cm) \times (10)}{(mass\ of\ car\ (kg))\ (time\ (s))}$
Time is measured from start to when car completely stops. Distance is measured from the edge of ramp to the back of the car. The distance will be measured perpendicularly to the ramp.	

FREQUENTLY ASKED QUESTIONS (FAQS)

Q. Will there be transportation available for me from my school?

A. Yes! There will be transportation available from each of the other four schools (Agua Fria, Desert Edge, Millennium and Verrado). Check with your school representative (see page 2).

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Q. Can I bring my family to the event?

A. Yes! Please bring your whole family as well as any other friends or acquaintances that are interested! There are activities and fun things to do for all ages!

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Q. Can I enter the Quiz Bowl and the Inquiry Projects?

A. Yes! You can participate in the STEM test/ Quiz Bowl and submit an inquiry project to either division (Curie or Einstein).

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Q. Can I submit a project to both the Curie and Einstein divisions?

A. No. You can only submit one inquiry based project.

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Q. Who do I speak with if I have questions on the event?

A. Please speak with your school site representative (see page 2).

–

Q. Can I still come to the event even if I do not submit a project or want to participate in the competitions?

A. Absolutely! The more the merrier! There will be plenty to do at the event whether you are actively competing or not!