



MST Newsletter

From MST Catalysts

April/May 2017

Edition 2, Volume 5

Overview of MST Research

Research is the cornerstone of the MST program at Manual. It is a required in at least 3 out of 4 years of high school. Research projects can be Science-based or Engineering-based. It may be conducted either in a lab setting or at home. Manual students usually work under the guidance of mentors who can provide guidance on the project. Mentors may be researchers at a college or university or they may be someone from an industry who is a subject matter expert in the students' area of interest. Research projects can broadly fall under 22 different ISEF-specific categories. The list of categories and the types of projects that fall under these categories can be found here. <https://student.societyforscience.org/intel-isef-categories-and-subcategories>. Once the student identifies an area of research and completes a project, the same research project can be used for presentation in many different competitions throughout the year.

Opportunities to Present/Compete

There are opportunities for Manual students to participate a variety of Science fair and Research-related competitions throughout the year. This is a list of some of the major events that many Manual students usually participate in.

Class Science Fair Presentation –

Usually conducted by the Science teachers in January/February. The individual teachers determine the actual format of this event.

duPont Manual Regional Science Fair (DMRSF) –

Usually held in March. This is a requirement for MST students. Depending on the year, ISEF awards Manual either 4 or 5 spots. The top 4 or 5 projects will move on to the International Science and Engineering Fair from DMRSF.

KY-Science and Engineering Fair (KY-SEF) –

Usually held at the end of March. The top 2 winners from the Regional Science Fair are automatically qualified to participate in the State Science Fair. In addition, 4-5 spots may be awarded by the State for “at-large” projects, which are picked by the Fair Director. In addition to category and several special awards, Manual students compete with the students from the rest of the state for 6 spots to ISEF.



Anjali Chadha, Emily Liu, Madison Sneve, Mr. Zwanzig, Greg Schwartz, Ben Jiang
ISEF Finalists

More Opportunities...

International Science and Engineering Fair (ISEF) –

Usually held in mid-May. In 2017, ISEF will be held in Los Angeles, CA. In 2018, ISEF will be held in Phoenix, AZ. Winners from DMRSF and KY-SEF will compete in a week-long competition at ISEF. Manual students have performed very well in past years and won several category and special awards. More information available at:

<https://student.societyforscience.org/intel-isef>

Kentucky Junior Academy of Sciences (KJAS) –

Usually held in Mid-April at Kentucky State University. Application deadline for KHAS is Mid-March. Students from across the Commonwealth of Kentucky apply to participate in a Presentation-style research competition. The top 3 winners in Life Sciences and top 3 winners in Physical Sciences win an all-expense paid trip to the American Junior Academy of Sciences competition that will be held in February of the following year. More information is available at:

<http://kyacademyofscience.net/junior-academy/>

American Junior Academy of Sciences (AJAS) –

Usually held in mid-February. This is a global scientific gathering that brings researchers, scientist, academicians, and students together for meetings and sessions discussing various scientific topics. There is also an opportunity for the students invited to AJAS to compete for college financial scholarships. In 2018, the KJAS winners will be attend AJAS in Austin, TX.

Junior Science and Humanities Symposium (JSHS - Regional) –

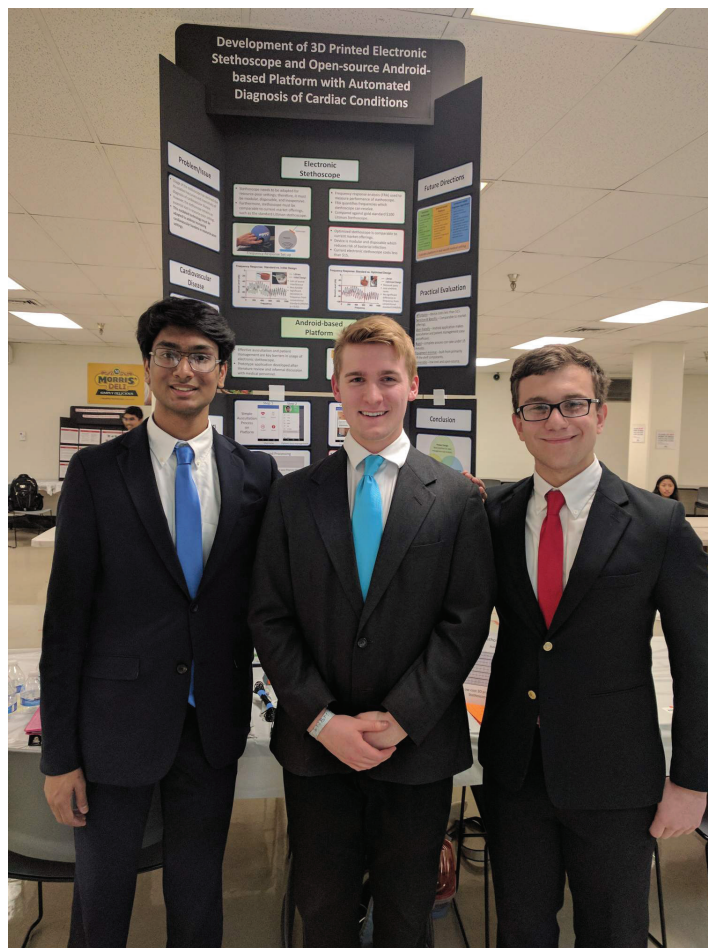
Usually held at the end of February or early March at the University of Louisville. This is a presentation – style competition sponsored by the US Army, Navy and Airforce. The top 5 winners from the Regional Symposium win an all-expense paid trip to the National JSHS. Top 3 winners also win financial Scholarships for college. Application deadline is mid-December. More information is available at:

<http://louisville.edu/education/jshs>

National JSHS Symposium –

Usually held at the end of April in different cities around the country. This year's National JSHS will be held in San Diego, CA. Regional winners from around the country will compete for prizes at the Nationals. Winners will receive additional financial scholarships. More information is available at:

<http://www.jshs.org/>



Harsha Paladugu, Ryan Folz, Abraham Riedel-Mishaan
ISEF Finalists

Siemens Science Competition –

Research materials submitted online to Siemens will be evaluated and regional winners will be chosen. Regional winners are interviewed using web-conferencing tools. Finalists are selected for the National Competition to be in December. Applications due in September. More information is available at:

<https://siemenscompetition.discoveryeducation.com/>

Regeneron Science Talent Search –

Application deadline is Mid- November. Open to students in their last year of high school. All research materials need to be submitted online. 300 Semifinalists will be announced in January followed by 40 finalists who will compete for large cash prizes. More information available at:

<https://student.societyforscience.org/regeneron-sts>

How can Manual students be successful at Science Competitions?

Here are some pointers that can help students get organized and ready for Science Competition season in High School:

- Don't waste the summer months. This is a great time to get started on your science research project and get ahead of the game!
- First, identify a research problem or find a research institution and/or mentor. Find an area of research that is interesting to you. You will spend many months working on this project, so it is best to find an area you are excited about.
- Make sure you have a lab or working space. Think through access to tools, equipment and experiment resources.
- Start early! You will need to spend at least 4 – 6 months for a good project. Research always takes more time than you think it will. It may take many attempts before you can fine-tune your work to get meaningful results.
- Keep track of all application timelines and dates. Make a calendar ahead of times and make sure to submit all your paperwork on time to school and to all the competitions.
- Most successful science fair projects are student-driven. If you are working on research projects that are not your own, and is the work of a graduate student or professor in a lab, your project will likely not win in the competitions. Judges are very good at figuring out which projects are student's original work.
- Don't wait till the last minute to make your presentation boards. Start early and be prepared well before competition time
- Practice, practice, practice your presentations. In addition to research skills, honing your presentation skills will take you far in science fair.

List of students who have won in various science/research competitions for 2016-17

Congratulations to everyone who participated and to the winners. We will share the list of winner from the National and International competitions after they are completed in May. We wish them good luck in the upcoming events.

ISEF Finalists for 2017: Manual students who will represent Team KY at ISEF are Anjali Chadha, Ben Jiang, Govind Krishna, Emily Liu, Greg Schwartz, Madison Sneve and the team of Praharshasai Paladugu, Ryan Folz and Abraham Riedel-Mishaan.

JSHS Regional Winners (Students promoted to National JSHS):

1st: Anjali Chadha
2st: Cassie Drury
3rd: Praharshasai Paladugu
4th: Arushi Gupta
5th: Annie Zhang

KJAS Regional Winners (Students promoted to National AJAS):

Grand Prizes, Group 1 (Life)

1st: Allison Tu
2nd: Betty Ngo
3rd: Agharnan Gandhi

Grand Prizes, Group 2 (Physical)

1st: Anjali Chadha
2nd: Gregory Schwartz
3rd: Nina Render

Full list of KJAS winners is available here:

<http://kyacademyofscience.net/junior-academy/>

Full list of Science Fair Winners for 2016-17 School Year:

DMRSF complete winner list:

dupontmanual.stemwizard.com/

KY-SEF complete winner list:

kysciencefair.org/2017-ky-sef-award-winners/

How can parents get involved at Manual?

As you can see, preparing for science fair and research competitions is an ongoing, year-round effort for the DMRSF board and volunteers. The first and foremost activity for this group is to raise adequate funds to cover the cost of travel, accommodation and food for the Regional fair winners traveling to ISEF. In addition to this, the board fund purchases of other items needed for students to pursue research activities in the school.

The Annual Fundraiser for DMRSF will be held in September 2017 and we urge all of you to actively support this organization help Manual students make a mark in the research world.

Another way to get involved is to join the DMRSF board. This is a group of volunteer parents and researchers from the community that meet monthly to coordinate logistics and fundraising for the Manual students. If you are interested in joining the board, please contact Mr. Skip Zwanzig at glenn.zwanzig@jefferson.kyschools.us or dmsrf@yahoo.com.



Team Kentucky at Intel ISEF

Intel ISEF International Results from duPont Manual

Intel ISEF held in Los Angeles, CA from May 15th – 19th, 2017

First Award – Cellular and Molecular Biology

Madison Sneve

Fourth Award – Chemistry

Govind Krishna

Fourth Award – Computational Biology and Bioinformatics

Gregory Schwartz

Fourth Award – Embedded Systems

Anjali Chadha

Third Award – Mathematics

Emily Liu

SPECIAL AWARDS

Acoustical Society of America

First Award of \$1,500

Abraham Riedel-Mishaan

Praharshasai Paladugu

Ryan Folz

American Physiological Society

First Award of \$1,500

Madison Sneve

Samvid Education Foundation

First Agni Award of \$1,000

Abraham Riedel-Mishaan

Praharshasai Paladugu

Ryan Folz

Winners from the National Junior Sciences and Humanities Symposium (JSHS)

Held in San Diego, CA on April 26-30, 2017



ORAL PRESENTERS –

Environmental Science Category

1st place

Anjali Chadha

Life Sciences Category – 3rd place

Cassie Drury

JSHS POSTER PRESENTERS –

Medicine and Health/Behavioral Sciences Category

3rd place

Annie Zhang

Club Spotlight: Future Problem Solving

Club Sponsor: Jill Lauroesch

Mission

Future Problem Solving is a KAAC team, as well as part of Future Problem Solving Program International (FPS-PI). It's goal is often stated as: "teaching students how to think, not what to think".

We help students learn to work in groups and use a structured approach to solving complex problems in any area.



Requirements/ Meetings

FPS participants need to be creative, curious, and able to work in small groups without adult direction. Experience in middle school FPS is helpful, but not mandatory. Meetings take place once a week for 1 1/2 hours, and some prep time outside of meetings (reading materials especially) is expected.

How Many Students

We take all students who wish to participate. Everyone is guaranteed participation in 3 league matches in the fall, the JCPS tournament in January, and individual FPS in March (separate fee of \$35). Once KAAC competition starts after the winter break, a maximum of 15 students (4 for each of 3 possible competitions, plus 1 alternate for each competition) can participate.

Activities

At our weekly meetings, we teach the problem solving process to new members, review the process for returning members, discuss the background vocabulary and material for each topic, and practice individually and in small groups using prompts. We also participate in 3 league matches in the fall against other JCPS schools (2 are skit-based, where students plan and act out a 4-6 minute skit to present a solution to a problem identified in a prompt; 1 is booklet-based, where groups of 4 students use the 6-step problem solving process to find and solve a problem in a prompt) and the JCPS tournament in January (also skit-based). Finally, we participate in KAAC Governor's Cup (booklet-based), trying to advance from district to regional to state competition. Students can also choose to participate in the individual competition at Governor's Cup in March (also booklet-based).

Goals

Our main goal is to get better at using the 6-step problem solving process to break down prompts, find a central issue/problem in them and write an action plan to address it. We try to combine information from all the subjects the students have studied in school, as well as background information provided by KAAC, to do this. We hope to advance to state and place well there.

Why Apply

FPS teaches students to approach complex problems using a structured approach and find solutions to them. It encourages creativity and helps students learn to work together, combining individual strengths, to solve these problems. And we have fun doing it!!

Important Upcoming Dates

MST Camp	May 30 - June 2
Camp Science Olympiad	June 5 - June 9

Teacher Spotlight: Ms. Kathy Fries

Role at Manual & Teaching Background

- **Role at dMHS:** Science Teacher , WISE sponsor
- **Subjects Taught:** AP Bio, Biology I (Advanced this year but have taught MST in past years)
- **How long at dMHS:** 15 years
- **Other schools:** 2 yrs Doss High School, 19 years Assumption High School
- **Coach:** no longer here at Manual – was JV volleyball coach when first came to Manual – previous coaching experience includes Varsity Volleyball at Doss, Varsity and JV Basketball, Softball and Volleyball at Assumption High School, Assistant Basketball IUS (College)
- **Education:** Eastern Ky University, University of Louisville (BA Biology, MAT Natural Science) Chemistry Minor



2017 duPont Manual Softball team

Early Love of Science

My 6th, 7th, 8th grade science teacher inspired my love for science. As a sixth grader I entered my first science fair and placed 3rd overall among 6th-8th graders. I have always been intrigued with nature and its connections to the body and the environment. My mother was a nurse and I would spend hours reading her nursing textbooks and asking her a million questions.

What I love about biology is its unique connection to my environment and the inner workings of my own body. Understanding the molecular level of biological interactions is absolutely amazing to me. It makes me appreciate the miracle and sacredness of life in myself as well as those life forms surrounding me.

Teaching at duPont Manual

Teaching AP students and MST students here at Manual have made me a better teacher. It has challenged me to handle my stress so that I can help my students with the stress of being part of a rigorous program.



Coaching Led to Teaching

Coaching drew me into teaching. I started coaching in Catholic schools (softball, basketball) when I was in high school, and coached my girls to a CSAA 8th grade City Basketball Championship! I played basketball and threw the discus in track in high school (no softball team) and played volleyball in college.

When I was in high school I was very involved with coaching, which is actually teaching if you are a good coach with any kind of skill level yourself. So I knew teaching was an option I would explore. I also was interested in medicine and pharmacy but ultimately chose teaching after a good experience with my high school basketball program.

Interests Outside of Manual

Outside of school I like to spend time outdoors kayaking and walking or jogging. I enjoy a good movie (Under the Tuscan Sun is my favorite) and a good book (my favorite is The Red Tent by Anita Diamant). I have 4 nieces and 2 nephews and many of them play or have played sports. I enjoy watching them when I can as we are a very sports oriented family.

I always like a new adventure as well as the comfort of something familiar like good conversation, good wine and good food with close friends and family. My last adventure was in Tuscany, Italy 2 years ago where I enjoyed a nice week of relaxing among family and friends. I've walked in Darwin's footsteps on the Galapagos Islands and took a wilderness kayaking trip around the glaciers of Alaska. Some of the beautiful experiences of my life include standing on the cross bridge amidst the Amazon canopy and watching the sun rise, hiking at midnight in the rainforest of Costa Rica while seeing bioluminescent insects light up the forest floor and observing a 2 ton baleen whale breach a quarter of a mile from my kayak.

I have been very blessed to have such amazing family and friends that bring joy to my life and I especially feel honored to be able to teach at Manual with such amazing faculty and students!



Galapagos Islands

Congratulations to the Manual Science Olympiad Team for Placing #1 in State!



Science Olympiad State Competition Results

State Finals held at Bowling Green, KY on April 22nd, 2017

Red Team

Anatomy and Physiology- 3rd place

Aditya Mehta (10) & Sara Frigui (12)

Astronomy- 1st place

Emily Liu (12) & Sabarish Kirthivasan (10)

Chemistry Lab- 1st place

Jobi Jose (11) & Madison Sneve (11)

Disease Detectives- 4th place

Aditya Mehta (10) & Jahnavi Sunkara (11)

Dynamic Planet- 1st place

Jahnavi Sunkara (11) & Julian Powers (10)

Ecology- 1st place

Allison Tu (10) & Nikhil Vangala (9)

Forensics- 1st place

Allison Tu (10) & Conor Blackburn (11)

Game On- 2nd place

Jesse Wang (11) & Madison Sneve (11)

Helicopters- 1st place

Jesse Wang (11) & Luke Morgan (10)

Hovercraft- 3rd place

Emily Liu (12) & Kenny Tien (9)

Invasive Species- 2nd place

Allison Tu (10)

Material Sciences- 1st place

Jobi Jose (11) & Madison Sneve (11)

Microbe Mission- 2nd place

Aditya Mehta (10) & Sara Frigui (12)

Optics- 3rd place

Emily Liu (12) & Kenny Tien (9)

Remote Sensing- 1st place

Julian Powers (10) & Sophie Lai (11)

Robot Arm- 2nd place

Jesse Wang (11) & Luke Morgan (10)

Rocks and Minerals- 4th place

Julian Powers (10) & Sophie Lai (11)

Towers- 1st place

Jesse Wang (11) & Nikhil Vangala (9)

Wind Power- 3rd place

Emily Liu (12) & Nikhil Vangala (9)

Write It Do It- 2nd place

Emily Liu (12) & Sara Frigui (12)

White Team

Astronomy- 4th place

Mark Raj (10) & Ishaan Jindal (10)

Disease Detectives- 2nd Place

Camille Rougier (11) & Lily Gonzalez (9)

Forensics- 3rd place

Camille Rougier (11) & Sydney Paek (9)

Game On- 1st place

Ben Jiang (11) & Raymond Suo (9)

Helicopters- 3rd place

Ben Jiang (11) & Will Morgan (11)

Hovercraft- 2nd Place

Ben Jiang (11) & Sophia Korner (12)

Material Science- 4th place

Lily Gonzalez (9) & Nelson Penn (12)

Optics- 1st place

Raymond Suo (9) & Sophia Korner (12)

Remote Sensing- 3rd place

Raymond Suo (9) & Pranav Senthavil (9)

Wind Power- 2nd place

Sophia Korner (12) & Bhargav Ramesh (10)

Science Olympiad Senior Officers Share Their Thoughts on Winning First Place

Lavanya Kanneganti, MST 12 Science Olympiad Senior Officer

It's not possible for me to fully express my love for this club in two paragraphs. I still remember the seventh grade girl that joined Science Olympiad six years ago because her friends were in it and because it was part of that "MST spirit." She found a group of determined, intelligent, and entertaining people that she was eager to get to know. At 12 years old, this girl competed in her first Science Olympiad events, placed in her first state competition...and cried at her first miss to nationals. It physically, emotionally, and mentally hurt her to watch her team devote a year's blood, sweat, and tears to their events only to come so close to their goal every year.

Fast forward to senior year, I knew that I wasn't going to end my career in Science Olympiad this way, and I was pretty sure that the other seniors were in agreement. But, we won on April 22 because everyone on the team wanted it and was willing to do anything for it—the students, the coaches, the parents, and even the freshmen. We won because we were finally able to break out of a cycle of our mistakes from previous years and confront our problems head on. I spent the last six years of my life chasing the thrill I had when I went on stage to receive my first Science Olympiad medal. I spent the last six months working to avoid the pain that came with another loss at state. I spent the last six weeks trying to come to terms with myself and what this team means to me as I end my senior year. And I spent the last six days smiling because this win was the perfect ending to an amazing journey.

Emily Liu, MST 12 Science Olympiad Senior Officer

I joined Science Olympiad in 7th grade, at Meyzeek Middle School. In my early Scioly days, I competed in engineering events, like Towers and Helicopters; I've since shifted toward physics events, like Optics and Astronomy. The complete flexibility to explore new areas of science is my favorite part of participating in Science Olympiad.

Winning the State Championship and qualifying for the National Competition this year has been the perfect end to six years of Scioly. For five years in a row, I was on the team that lost the State title to Russell (first in middle school and then in high school). Finally being able to compete at the National Competition, especially as a Senior Officer and with a dream team of both underclassmen and upperclassmen, is very exciting and fulfilling.

Manting Xu, MST 12 Science Olympiad Senior Officer

From middle school to senior year, the goal in Science Olympiad has always been to make it to Nationals. We happened

to reach our goal during the final year of my Science Olympiad career, making it so much sweeter.

However, this club didn't reach Nationals on its own. Throughout the year, our coaches and officers and all the talented competitors dedicated countless hours to Science Olympiad. The club was patient, understanding, and supportive as my fellow officers and I worked diligently to finish all our tasks and meet deadlines. I'm sure we're all excited to see our late-night group chats (of course they were always on topic!) and officer meetings come to fruition.

As an officer junior and senior year, I watched myself mature as I took reign of more logistical elements of running a club. While writing the club's emails and making late-night team revisions to coordinating meetings, testing, and invitationals, I experienced not only the effort it takes to properly run a club, but also the satisfaction of doing something I love.

It's been a rewarding experience to be a part of this wonderful club, and with a team full of dedicated students, officers, and coaches, I have confidence that this club is in for years of success. But above all, I hope that everyone in this club will immerse themselves and expand their knowledge and love for science.

Sophia Korner, MST 12 Science Olympiad Senior Officer

When I started Science Olympiad, I was a 6th grader at a new school. I didn't know anyone. I decided to join Scioly and when I went to the first meeting I was immediately welcomed into the fold. There were about 90 of us students packed into a single, stuffy classroom to listen as a few upperclassmen went through a PowerPoint describing each of the events and what areas of science they dealt with. The engineering events quickly grabbed my attention as I wanted to work with my hands. I joined a couple of engineering events, gained teammates, and worked hard to support my newfound friends. My teammate and I ended up placing third in Battery Buggy (an event in which we built a battery powered vehicle) at state. For the next four years, I continued to join engineering events, most notably Mission Possible (one of the hardest building events, my teammates and I created Rube Goldberg machines). I continued to place at state and regionals and tried to push my team towards nationals.

As a senior, I have participated in this community for seven years. Going to nationals for the first time is a goal seven years in the making and that waiting period just sweetens our victory. I am ecstatic to be competing with my friends one last time and I hope that this victory can inspire more in the future.