

# IT TAKES A VILLAGE TO RAISE AN ENGINEER!



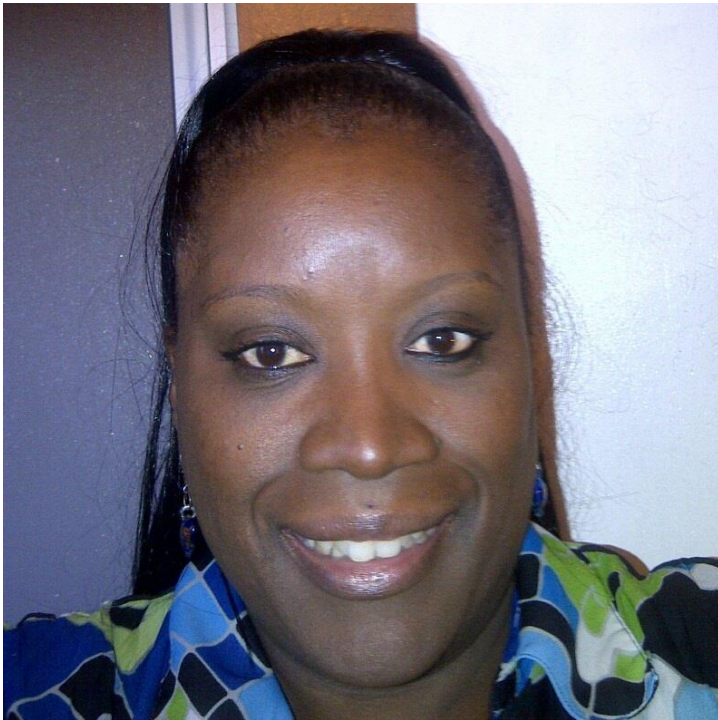
How schools, parents, students, colleges, community orgs and businesses collaborate to get students of color excited about STEM!

October 10, 2019

Presented by Audrey Thompson  
Founder & Executive Director of the Engineer Factory



# Audrey Thompson's Backstory



- Grew up in South LA
- Earned BA in Political Science and MA in Urban Planning from UCLA
- More than 25 years of nonprofit leadership & fund development experience
- Career focused on improving underserved communities
- Founded Engineer Factory in 2016 with family
- Mother of three amazing kids

# Why did we establish the Engineer Factory?



These are our reasons!  
But the stats are stacked against  
my kids!

# Jaylen Thompson, Electrical Engineer! Our first Legacy!



# Engineer Factory Mission- What We Seek to Achieve

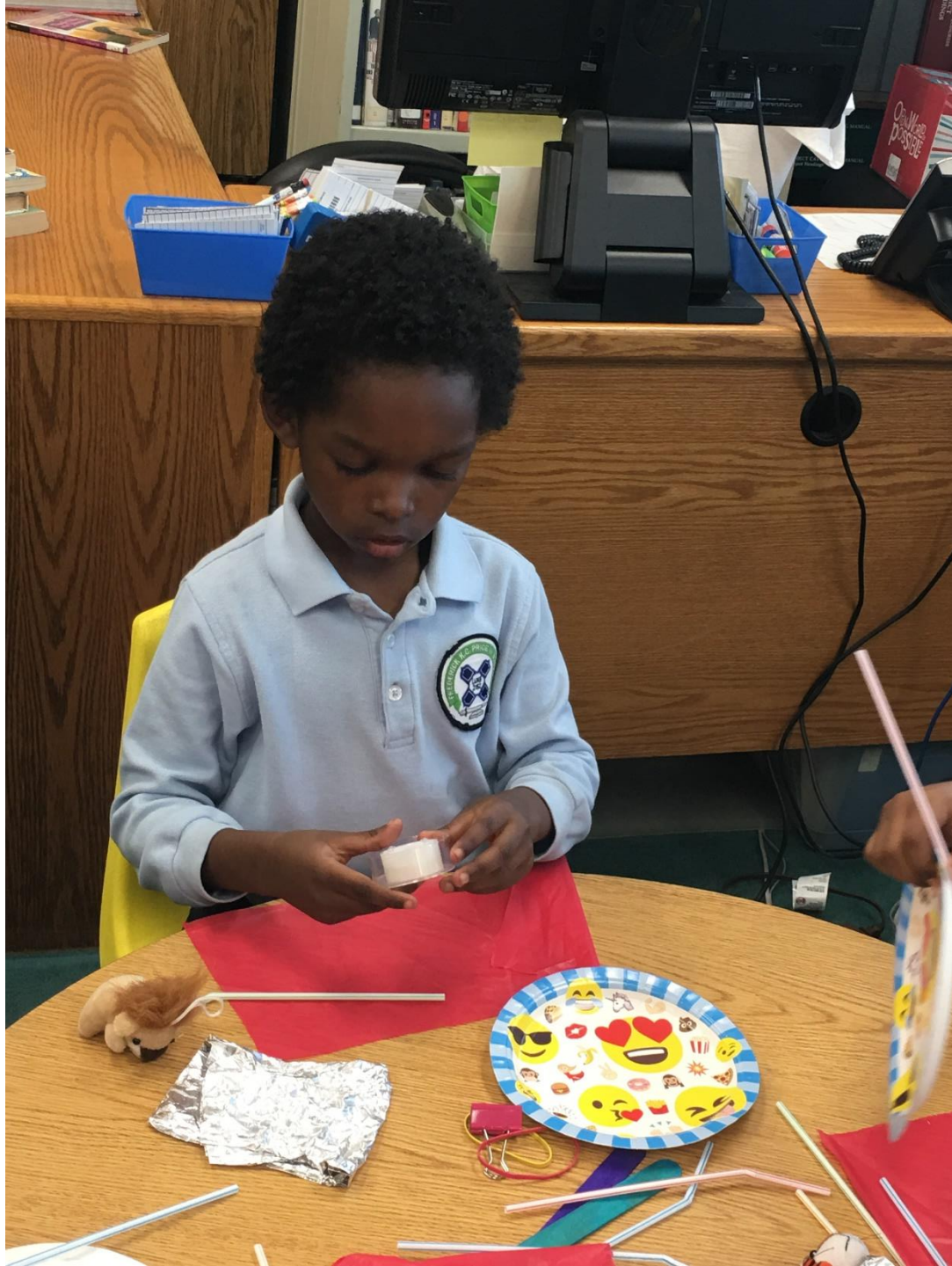
- The mission of the Engineer Factory is to increase the number of students from underrepresented populations (girls and students of color) who pursue higher education and careers in Engineering and STEM. This is accomplished through:
  - hands-on, project-based learning opportunities (STEM workshops);
  - participation in engineering competitions;
  - academic support, particularly math;
  - professional development for educators;
  - exposure and linkages to the engineering industry & mentoring;
  - strategic alliances and partnerships with engineering-related programs;
  - and by awarding scholarships to deserving high school students

# Members of our Village

- Elementary Schools (students, teachers, administrators, staff & parents)
- Churches and Community Organizations
- Middle & High Schools (students/cogs, teachers, administrators, staff & parents)
- Colleges & Universities (Legacies, NSBE, SHPE, WID, Fab Lab and MSTI (Math Science Teacher Institute); CSU Chancellor's Office)
- Businesses and Corporations

# How to raise an Engineer? Early Exposure to STEM—It's Elementary!

- Exposure to STEM *early* and *often*
- Engineer Factory partnered with seven (7) elementary schools in 2018-19 (Inglewood USD, LAUSD, Charter & Christian)
- Served more than 3000 TK-6 students with our in-school program in 2018-19 school year
- Introduce Engineer Design Process
- Build STEM-Confidence
- Meet NGSS requirements
- Create a “STEM” Culture in our schools and communities; help “STEM-skittish teachers
- ❖ **Villagers:** Students, teachers, administrators and parents



























His excitement makes my heart happy!





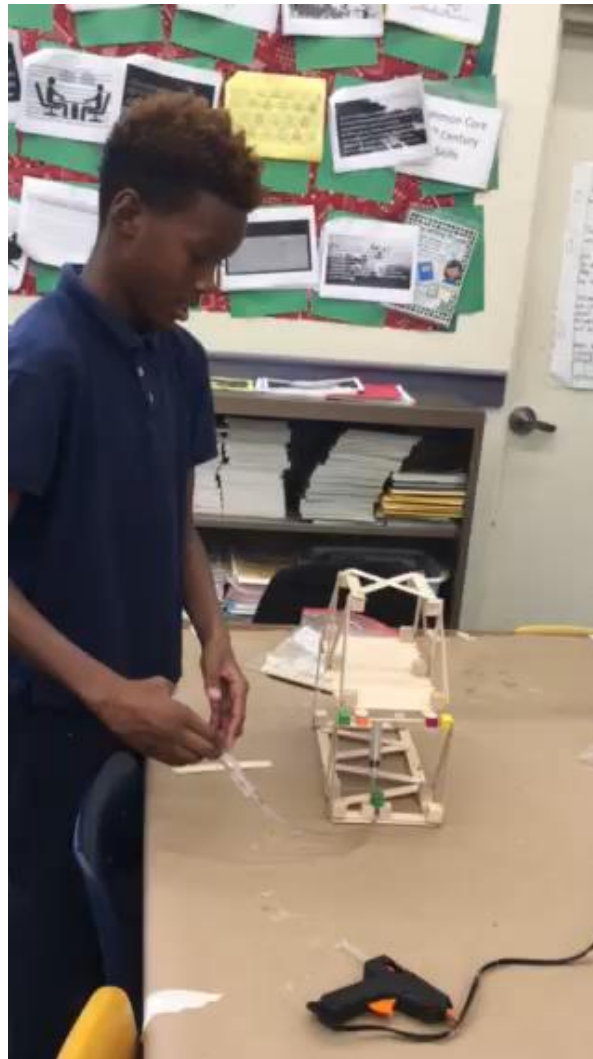
# Hey Tesla, we're building your work force!







# Future civil engineer-hydraulic bridge!











# The next Disney Imagineers!





4+2  
3x5  
BACK TO SCHOOL  
3-5  
4-2  
BACK TO SCHOOL  
3-5  
4-2  
BACK TO SCHOOL



CLASSROOM RULES  
DREAM BIG  
DO YOUR BEST  
FOLLOW DIRECTIONS  
TALK TO YOURSELF  
LISTEN CAREFULLY  
THINK BEFORE YOU SPEAK  
BE KIND TO EVERYONE  
WORK TOGETHER  
RESPECT OTHERS' IDEAS

March 20, 2019  
Agenda  
- Peace Bible - Psalm 124: 1-5  
1 Spelling Test - Stable  
2 Ball Game - (1/2) (1/2) 50' Dash  
3 Mrs. Smith  
4 Jump  
5 Everything  
6 Read  
7 Can

Ebn musk  
Wouldn't

Space X  
Tesla

1. Angle + Mechanical  
2. barrel  
3. bucket  
4. Captain  
5. chackie  
6. Fable  
7. frighten  
8. global  
9. heron  
10. lengthen

Civil  
Computer science

Estimote M.  
T. 20

ALLENCRAFF  
23

SELF CARE





# STEM meets Jackson Pollock!





# Questions for the Audience



Tell us about the STEM activities at your elementary schools

Are there local organizations with whom you can partner to bring more STEM to your school?

# How to raise an engineer? Show them engineer students and pros who look like them!

- Engineer Factory conducts STEAM Days for K-8 students at various community locations
- Introduce K-6 students to fun STEM projects
- Allow high school students to volunteer and earn community service hours
- Gives companies and community organizations a clearly defined way to contribute and volunteer
- Opportunity for funders to sponsor STEM activities at schools with limited resources





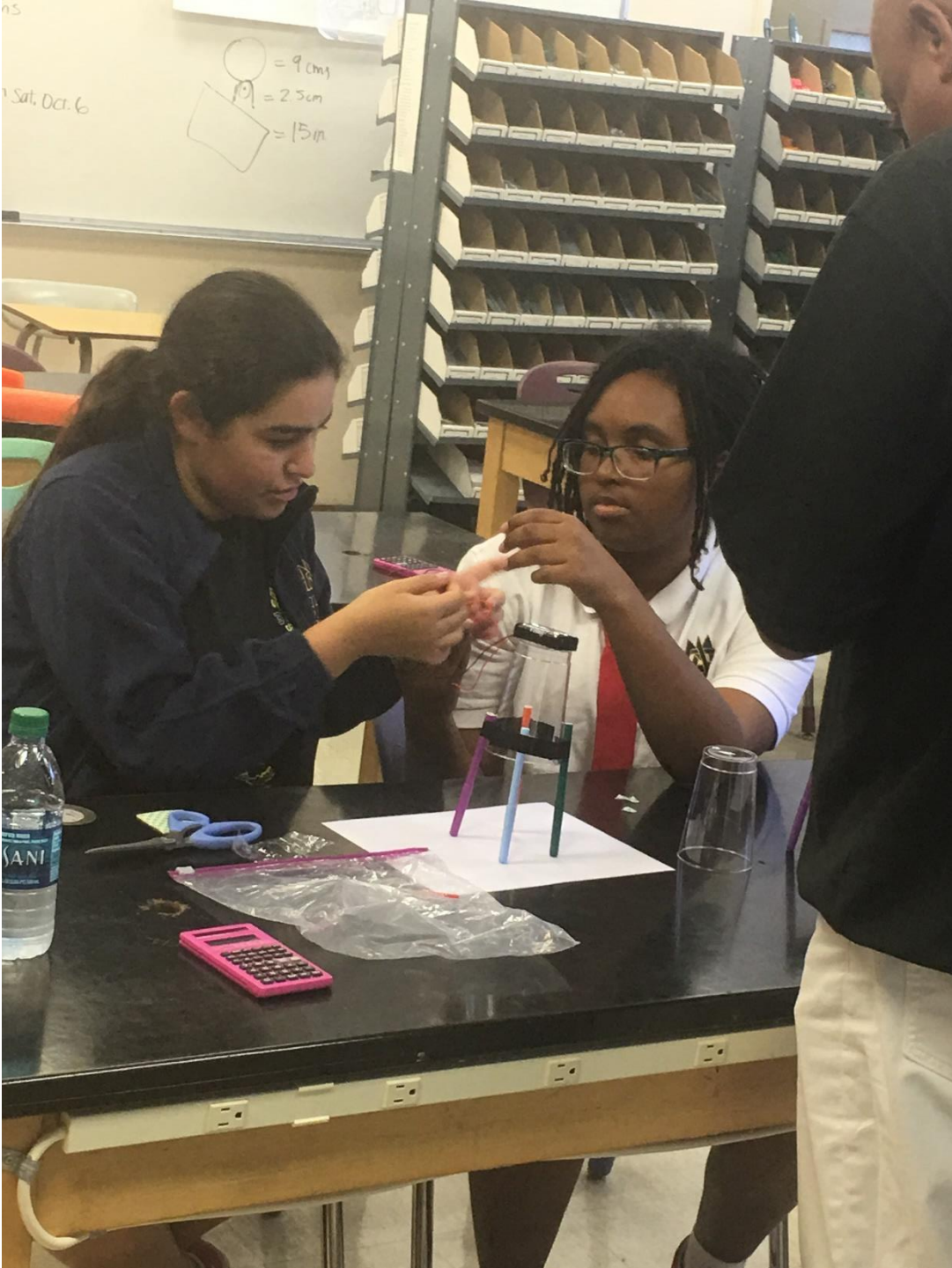
MARTIN LUTHER KING, JR.  
ELEMENTARY SCHOOL

MARTIN LUTHER KING JR.  
SCHOOL

STAFF  
ON WEEK  
11

STEAM AT  
ML. KING JR. E  
SCIENCE TECHNOLOG- ENG: A









13 GENIUS  
one percent  
inspiration  
AND Ninety Nine  
Percent  
PERSPIRATION

#I Engineer Because...  
Gender  
EQUITY

#I Engineer Because  
I am creative

#I Engineer  
Because...  
I am creative

#I Engineer Because  
I believe there should  
be more Latina women in  
this career

#I Engineer Because  
I want to make  
the engineering field  
more diverse and I  
want to make money

#I Engineer Because  
I want to be a girl  
Change And  
improve The  
World

ST. PETER'S  
ACADEMY  
CLASS  
OF 2022

EVERY DROP  
COUNTS  
DONATE  
FOOD

EVERY DROP  
COUNTS  
DONATE  
FOOD











# Questions for the Audience



Can you envision a STEAM Day at your school?

Which local high school and/or college students in your community will you approach to help your elementary school STEM programs?

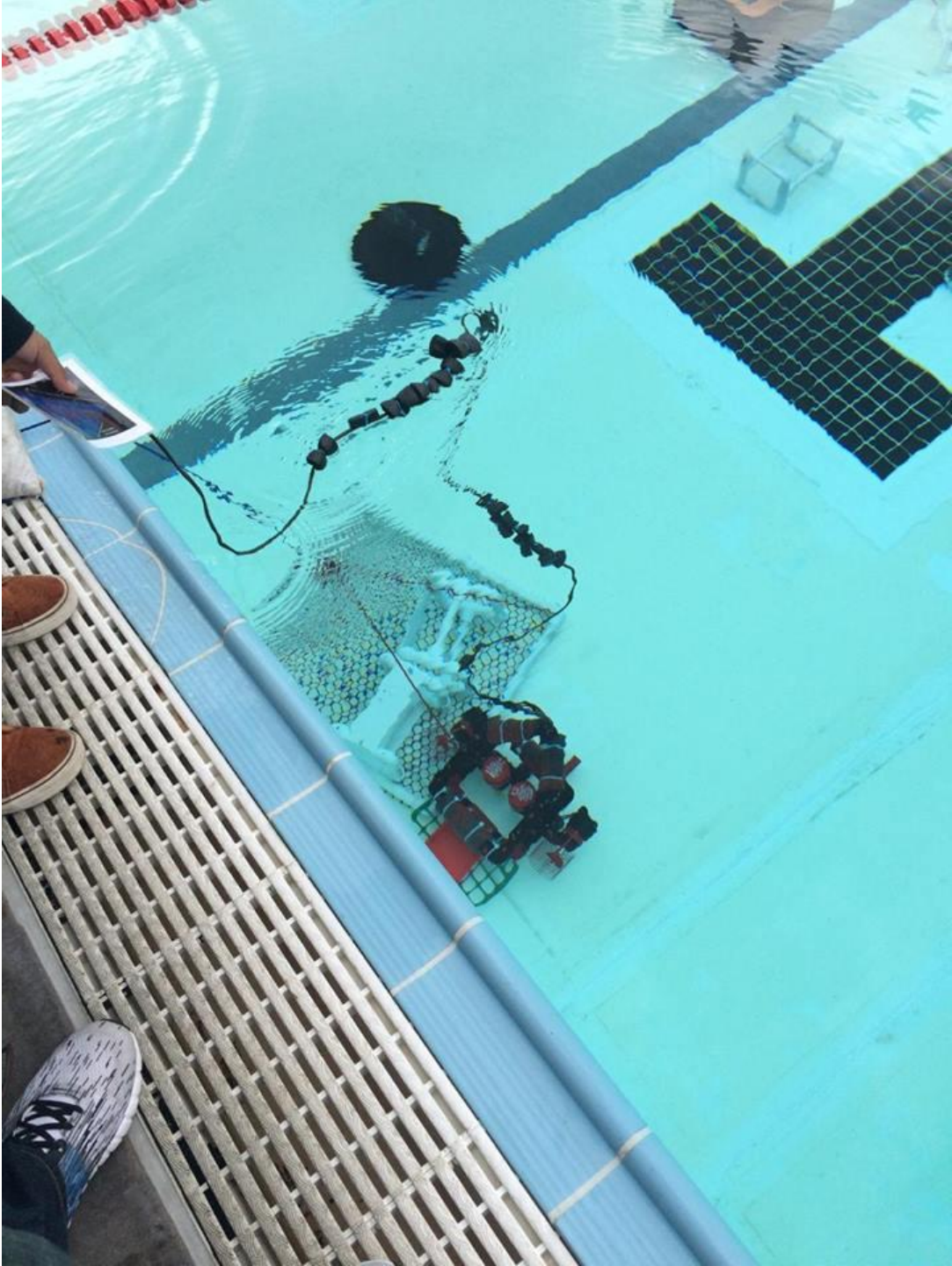
# How to raise an engineer? Teens love the thrill of competition!

- Competition is the “hook” and keeps the students engaged
- Many engineering corporations conduct competitions for middle & high school students. Way to identify future talent.
- Lack of participation by African American and Latino students.
- Engineer Factory supports students in underserved communities become competition ready!



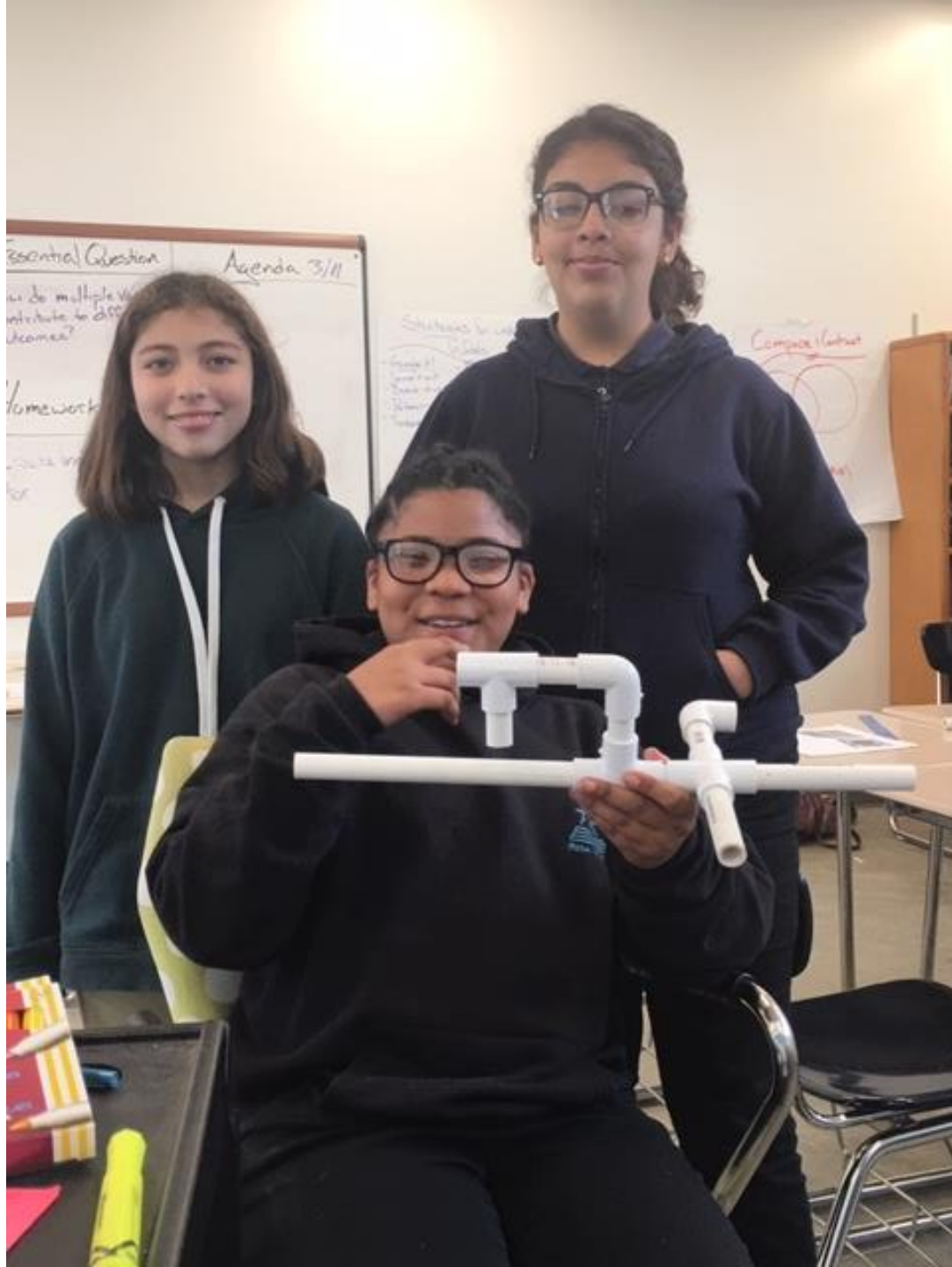
















# MATE ROV COMPETITION

2nd Place Scout Class



**LB**<sup>™</sup>  
LONG BEACH  
CITY COLLEGE

LBCC  
Electrical  
Program

## Upcoming Events

- June 2**  
**Construction Meeting**  
Morningside High School  
10500 S. Yukon Ave. • 6:30 p.m.
- June 2**  
**Construction Meeting**  
Monroe Middle School  
10711 S. 10th Ave. • 9 a.m.
- June 9**  
**Last Day of School**
- June 15**  
**Regular Board Meeting**  
Inglewood Unified School District  
401 S. Inglewood Ave.  
5:30 p.m.

## Please Join Our IUSD Family

Some of the Current Classified Employment Opportunities at Inglewood Unified School District:

- Child Development Assistant**  
Posting Date: 2/1/16  
Open Until Filled
- Substitute Teacher - Immediate Opening**  
Posting Date: 3/15/16  
Open Until Filled
- School Police Officer**  
Posting Date: 4/14/16  
Deadline: 10/17/16 at 8 PM.
- Special Education Teacher - Special Day Class (SDCI) Moderate/Severe - Immediate Opening: 2015-16**  
Posting Date: 4/15/16  
Open Until Filled
- Special Education Teacher - Special Day Class (SDCI) Eligibility List 2015-2017**  
Posting Date: 4/15/16  
Open Until Filled
- School Psychologist - Eligibility List 2015-2017**  
Posting Date: 4/15/16  
Deadline: 7/29/16 at 4 PM.
- Resource Specialist Teacher (BST)**  
Posting Date: 4/15/16  
Open Until Filled
- Program Specialist - Special Education - 2016-2017**  
Posting Date: 4/15/16  
Deadline: 7/29/16 at 4 PM.
- Instructional Assistant - Special Needs**  
Posting Date: 4/20/16  
Open Until Filled
- School Nurse - Inpatient - Immediate Opening**  
Posting Date: 5/3/16  
Open Until Filled
- School Safety Assistant**  
Posting Date: 5/12/16  
Open Until Filled
- School Counselor - K-8 2016-2017**  
Posting Date: 5/17/16  
Deadline: 7/1/16 at 12 PM.
- Facility Technician**  
Posting Date: 5/20/16  
Deadline: 6/17/16 at 5 PM.
- Custodian/Substitute Custodian**  
Posting Date: 5/20/16  
Open Until Filled
- Bus Driver/Substitute Bus Driver**  
Posting Date: 5/20/16  
Open Until Filled
- Employment opportunities for Inglewood Unified School District by visiting [www.iusd.org](http://www.iusd.org)

## Monroe Wins Second Place In ROV Competition

On May 7th, IUSD's Monroe Middle School brought home the second place prize in the MATE Remote Operating Vehicle (ROV) competition. Although it was their first time competing, Monroe's Underwater Robotics (ROV) Team was one of the top winners amongst 70 schools.

Monroe's ROV Team partnered with The Engineer Factory, a non-profit group that wants to inspire underrepresented populations to strive in the STEM field, and received professional mentoring that helped contribute to the school's success.

The group's Executive Director, Audrey Thompson, worked with 13 eager Team Monroe students every week for months until the week of the competition. The team met on Fridays from 2:30 pm- 4:30 pm, and they also came together on two different Saturdays to fully prepare for May 7th.

According to Thompson and Team Monroe's sponsoring teacher and mentor, Alicia Reyes, the students' level of teamwork was excellent. "They were supportive of each other's efforts and they encouraged and pushed each other to step out of their

comfort zones," recalled Thompson. When it came to working on their project, the students organized positions on the team, some students taking on the role of the CEO, CFO, and prop building lead, amongst other positions.

Although learning to get along was an important skill to develop, Thompson and Reyes emphasized the importance of resilience: staying encouraged in spite of the conflicts that arise in a situation. Thompson elaborates on this lesson by saying, "We explained to the students that not always getting it right the first time is a part of the scientific process." The ROV Team bought into this concept fully and set up a safe space themselves where they would not berate anyone for asking a simple question or running into difficulty.

"When someone said a great idea, another would have different ideas. So it was hard to just get one," reflected Monroe 8th grader, Kevin Perez. However, the students made sure that they were accepting one another's ideas and stayed focused on the mission.

It is a good thing, too. The day

of the competition, Monroe's ROV Team had to put their collaborative and technical skills to the test when they faced a serious problem just moments before the competition began. A propeller on one of the motors the students had built came loose, and the team was given 20 minutes to fix the issue or else they would be disqualified. Team Monroe did not panic. They immediately spoke to competing team members to ask for spare tools, and ultimately the students were able to put their heads together to fix their machine and go on to their second place victory.

After winning the competition, these IUSD future scientists were eager to expand their experience with engineering. According to Reyes and Thompson, there was no doubt that the Monroe's ROV Team will compete in next year's event.

Alicia Reyes reflects on the past three months of work and admantly states, "I am an advocate for providing my students with as many opportunities to compete in the STEM competition." Who knows? With their resilience, teamwork, and mentorship next year, the Monroe ROV Team just may be number one!



Monroe's Underwater Robotics Team



The students learned teamwork and resilience through the 3 month process

## Monroe Gana el Segundo Lugar en la Competencia ROV

En Español

El 7 de mayo, la Escuela Secundaria de Monroe de IUSD trajo a casa el segundo premio en el concurso ROV MATE. A pesar de que era su primera vez compitiendo, la Submarina Robótica (ROV) de Monroe fue uno de los primeros ganadores entre 70 escuelas.

El Equipo ROV de Monroe se asoció con The Engineer Factory, un grupo sin fines de lucro que quiere inspirar a las poblaciones con baja representación esforzarse en el campo de STEM y recibió la tutoría profesional que ayudó a contribuir al éxito de la escuela.

Director ejecutivo del grupo, Audrey Thompson, trabajó con 13 estudiantes ansiosos del equipo Monroe cada semana durante meses hasta la semana de la competición. El equipo se reunió el viernes de 2:30 pm- 4:30 pm y también se reunieron en dos diferentes sábados para terminar de prepararse para el 7 de mayo.

Según Thompson y Alicia Reyes la maestra patrocinadora del Equipo de Monroe y mentora, el nivel de trabajo en el equipo de los estudiantes fue excelente. "Ellos dieron su apoyo a los esfuerzos de los demás y alertaron y se ayudaron el uno al otro a salir de su zona de confort," Thompson recordó. Cuando se trataba de trabajar en este proyecto, los estudiantes organizaron posiciones en el equipo, algunos estudiantes que toman el papel del CEO, CFO y otras la construcción del liderazgo, entre otras posiciones.

Aunque aprender a llevarse bien era una habilidad importante para desarrollar, Thompson y Reyes destacaron en la importancia de la resiliencia: mantenerse animado a pesar de los conflictos que surgen en una situación. Thompson explica en detalle esta lección diciendo: "Les explicamos a los alumnos que no siempre hacer las cosas bien la primera vez es una parte del proceso científico." El equipo ROV estuvo de acuerdo en este concepto totalmente y ellos mismos crearon un espacio seguro en el que lo habían sin menospreciar a nadie por hacer una pregunta simple o pasar con dificultad.

"Cuando alguien dice una gran idea, otra tendría ideas diferentes. Así que era difícil de obtener sólo uno," se refleja Kevin Perez, del 8º grado De Monroe. Sin embargo, los estudiantes se aseguraron de que estaban aceptando unas ideas de los demás y se enfocaron en la misión.

También, es una buena cosa. El día de la competición, el equipo ROV de Monroe tuvo que colaborar y poner sus habilidades técnicas para la prueba cuando se enfrentaron a un problema serio sólo momentos antes del comienzo de la competición. Una hélice en uno de los motores de los estudiantes que habían construido se soltó y el equipo se le dio 20 minutos para solucionar el problema o de lo contrario sería descalificado. El Equipo de Monroe no entró en pánico. Ellos hablaron de inmediato a los miembros del equipo que competieron

para pedir piezas de herramientas y en última instancia, los estudiantes fueron capaces de pensar juntos para arreglar su máquina y pasar por la victoria del segundo lugar.

Después de ganar la competencia, estos futuros científicos de IUSD estaban ansiosos por ampliar su experiencia con la ingeniería. Según Reyes y Thompson, no había duda de que el equipo del ROV Monroe competirán en el even-

to del próximo año. Alicia Reyes refleja en los últimos tres meses de trabajo y rotundamente afirma: "Soy una interesada de proporcionar a mis alumnos con la mayor cantidad de oportunidades para competir en este concurso STEM." ¿Quién sabe? Con su capacidad de resiliencia, trabajo en equipo y el trabajo del próximo año, el equipo de ROV de Monroe sólo puede ser el número uno!

**ATTENTION!**

**INGLEWOOD UNIFIED SCHOOL DISTRICT APPLICATION FOR CITIZENS' OVERSIGHT COMMITTEE**

Inglewood Unified School District is seeking two qualified, interested individuals to serve on a committee of community leaders which will serve as the independent Citizens' Oversight Committee ("COC") for the implementation of the District's Measure GG school facilities bond program. The two seats that are available are:

- Business Representative - Active in a business organization representing local business**
- Parent/Guardian of Child Enrolled in District & Active in a Parent-Teacher Organization.**

On November 8, 2012, voters residing within the Inglewood Unified School District passed Measure GG. Measure GG is a \$90 million bond measure that authorizes funding for needed repairs, upgrades and new construction projects of the District's schools. Proposition 39 required a 55% supermajority for approval; Measure GG was passed by 66.1%.

If you fit one of these constituencies we encourage you to apply. The application and bylaws may be downloaded on the District's website by visiting [www.iusd.net](http://www.iusd.net).

If you wish to serve on this important committee, please contact Mariela Zambrano at (310) 419-2726 to obtain an application to apply. Completed applications should be sent or handed to the Office of the State Administrator of the Inglewood Unified School District at (310) 660-5144 by 4:00 PM on June 15, 2016.



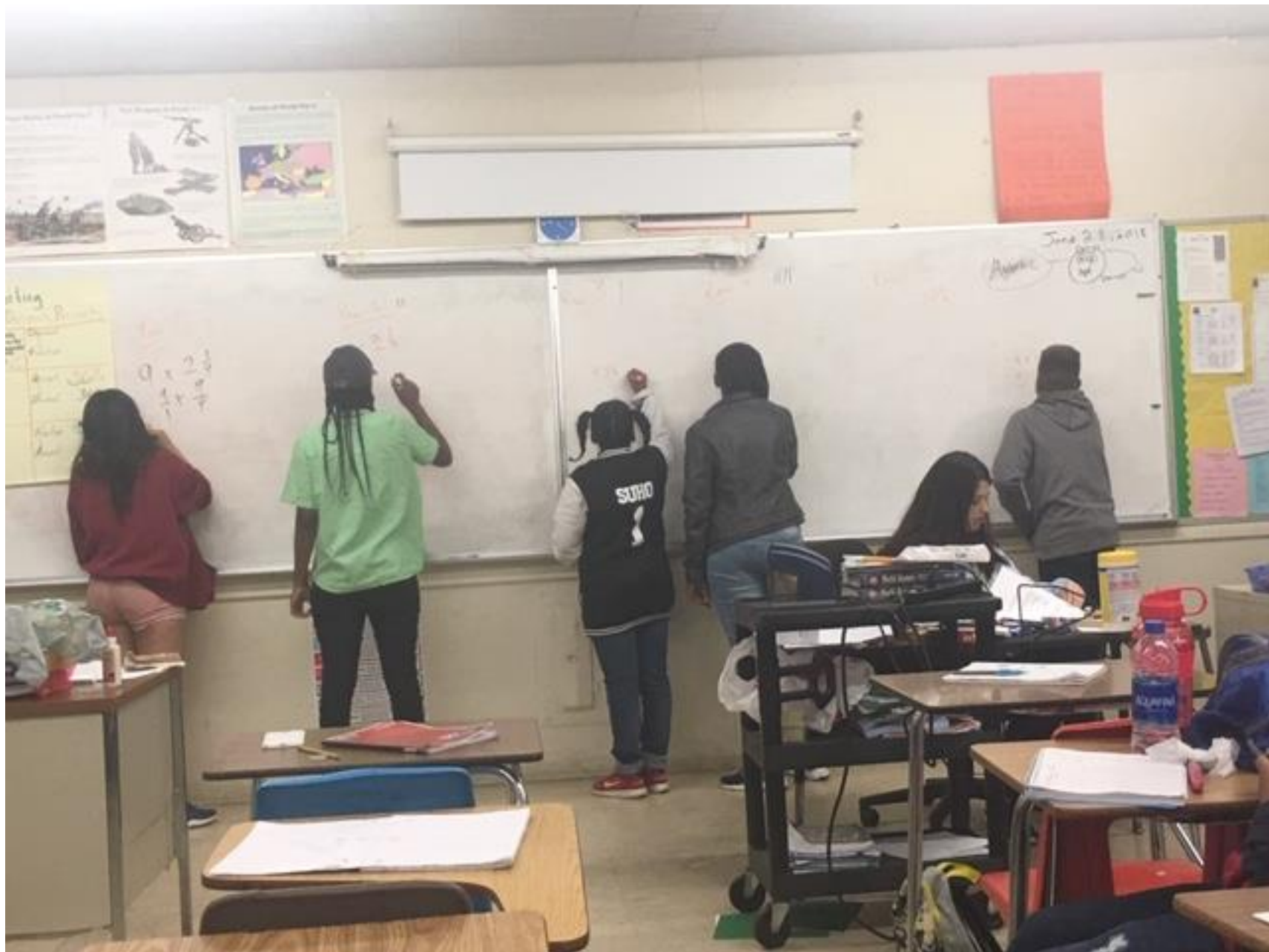
# How to raise an engineer? Help our students to have #MathSwag

- Math achievement is a big challenge for African American and Latino students
- CSU Chancellor reports that 65% of Black, Latino and female college students change from STEM-related major to non-STEM major in first two year
- Biggest reason cited is math
- ❖ Engineer Factory selected at CSU Summer Algebra Institute in 2018 & 2019



# CSU Summer Algebra Institute

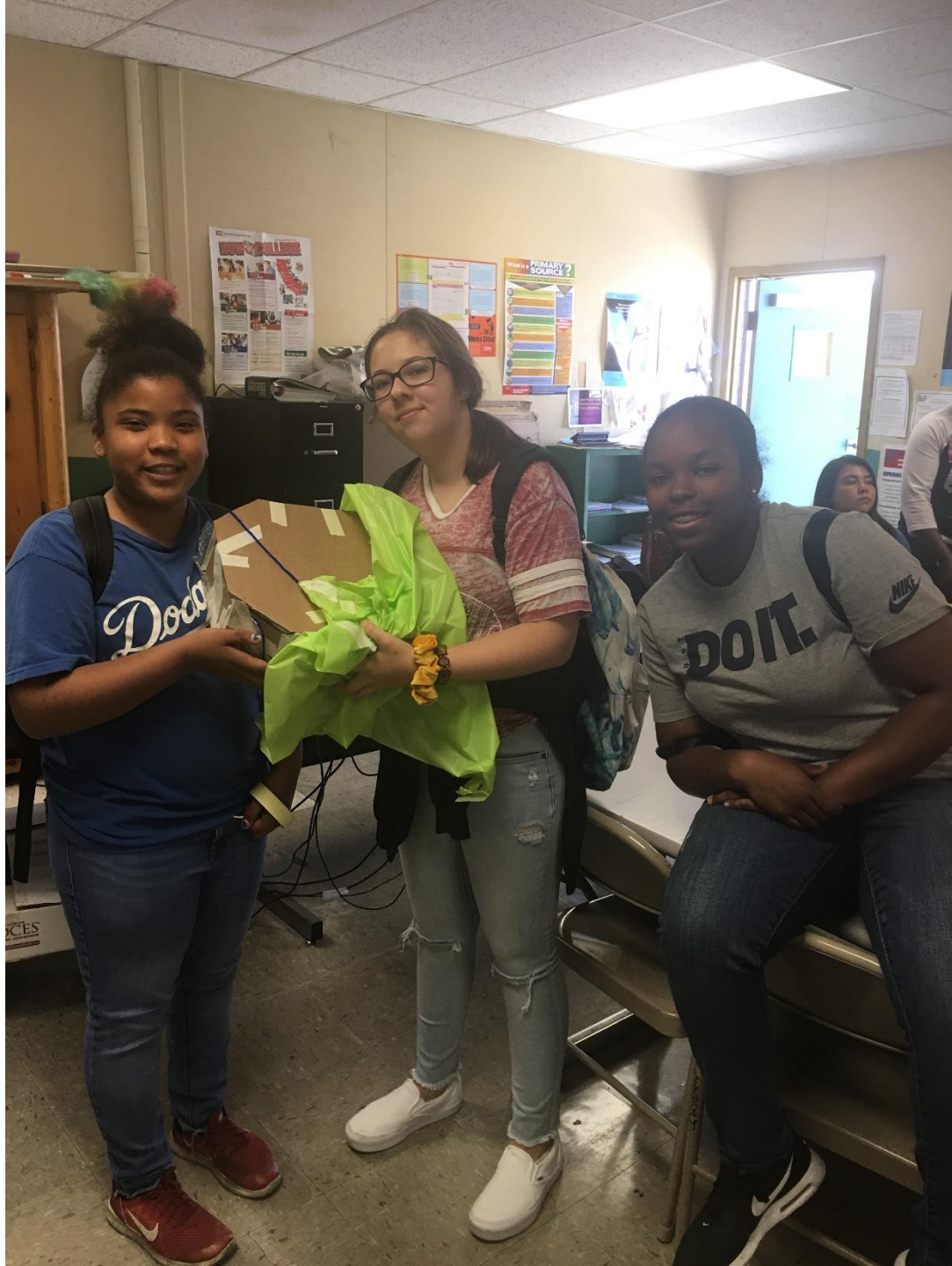
- Established to strengthen math skills of students of color; ensure college ready
- Evaluated by UCLA MDTP
- Six-week program includes math instruction, STEM projects, college readiness workshops and field trips
- Results have been great! Engineer Factory had 77% (2018) and 82% (2019) of students with increase in math proficiency
- **Villagers:** CSU MSTI, CSUDH, CSU Chancellor's Office, IUSD, South LA Robotics, Hack4Good and Google















**CONTRADICTION**  
When two or more statements or ideas are presented together, but one of them contradicts or denies the other.

**DICTION**  
The choice of words and the way they are used to convey a message.

*[Framed certificate or document]*

**HYPERBOLE**  
Exaggeration for emphasis or effect.

**IMAGERY**  
The use of words to create a picture in the reader's mind.

**JUXTAPOSITION**  
The placement of two things side by side to highlight their differences or similarities.

**METAPHOR**  
A comparison between two things that are not alike in an essential way.

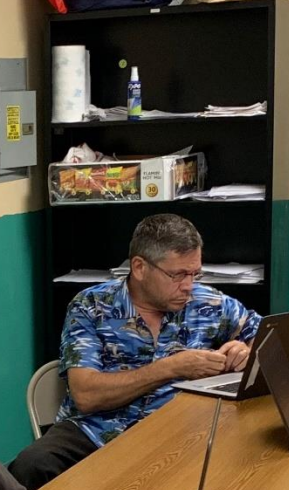
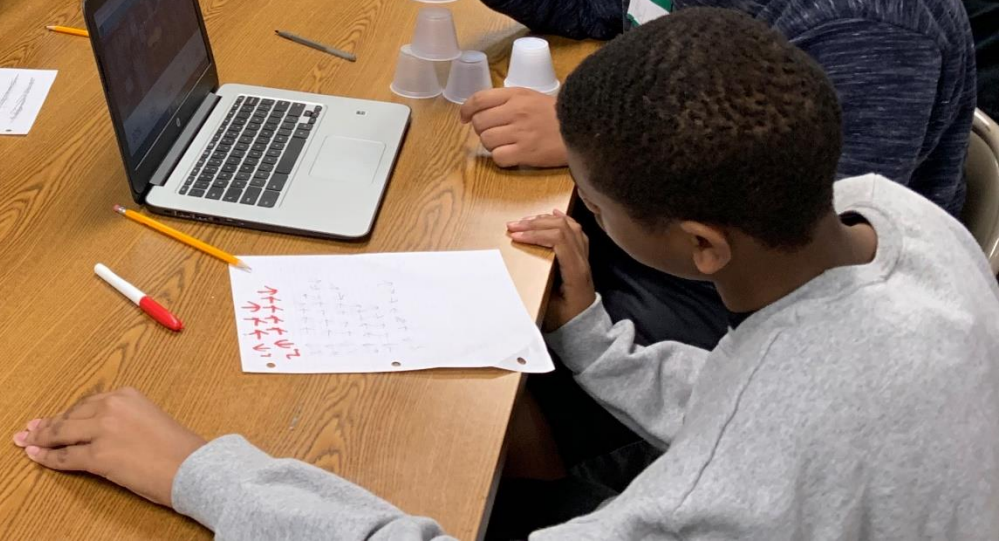
**PARALLELISM**  
The use of similar grammatical structures to create a sense of rhythm and balance.

**PERSONIFICATION**  
The attribution of human qualities to an object or animal.





What will you  
**LEARN**  
today?



...ions  
...ts.  
...ou care

**RISE**  
above your

- ✓ Never split infinitives.
- ✓ Verbs have to agree with their subjects.
- ✓ Between you and me, case is important.
- ✓ Correct spelling is essential.
- ✓ Watch for dangling participles.
- ✓ Use your apostrophes correctly.
- ✓ Avoid clichés.
- ✓ Don't use commas that aren't necessary.
- ✓ Proofread your writing.

South  
Los Angeles  
**ROBOTICS**

**Parallel Structure**  
Identify Subjects and Verbs

**WHY?** It helps

**WHERE?** In all writing

**WHY?** It makes

**SHOT**

**Abilix Krypton 5**  
Brick Series



**Mad WORDS**

**Mad WORDS**

**Can you feel it?**

**PURPOSE**  
MISSION

**\$**















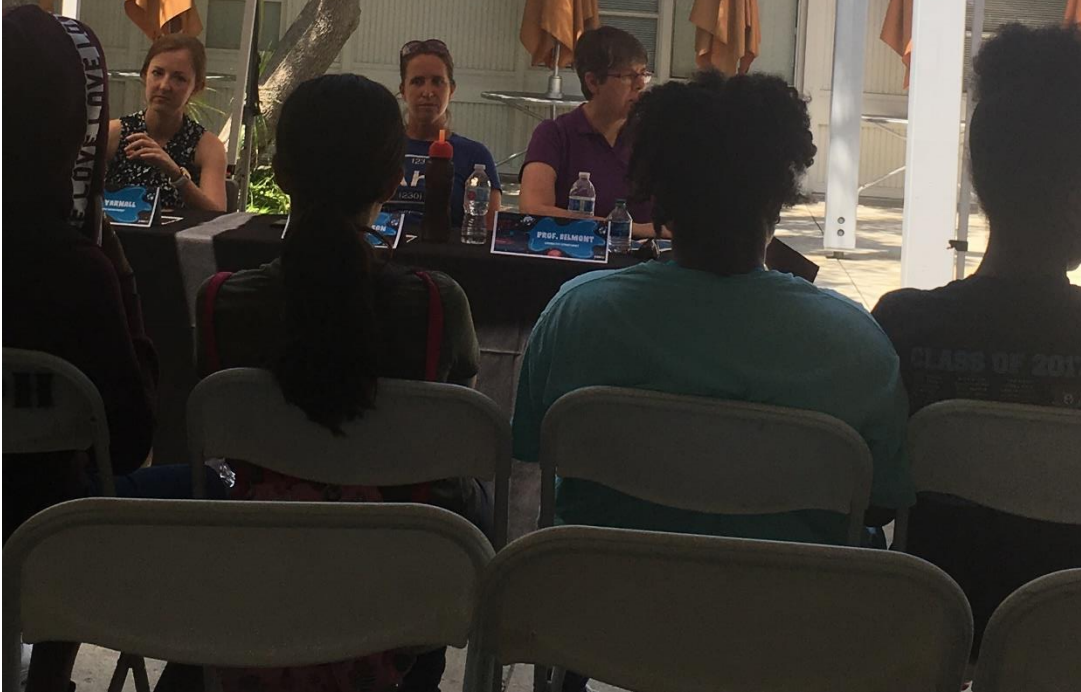
CA STEM INSTITUTE FOR INNOVATION  
AND IMPROVEMENT AT CSUDH

CA STEM INSTITUTE FOR INNOVATION  
AND IMPROVEMENT AT CSUDH

YARBALL

YARBALL

PROF. BELMONT

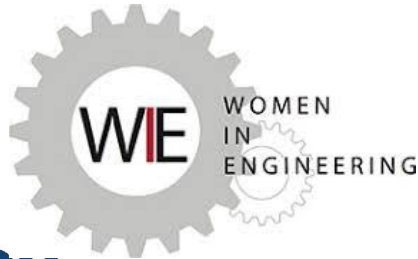


August 2, 2019



**Knott's**  
BERRY FARM

# Villagers who help



# Plans to expand the Engineer Factory Village in 2020!

## #MathSwag Labs

- Elementary Schools (facilities)
- Lab Management (MSTI Students)
- Volunteer Recruitment & Coordination (Parents)
- Volunteers (COGS, NSBE, SHPE, WIE, Community College students, Girl Scouts)
- MDTP (Data analytics)



## AAU for STEM

- Work with cohort of rising 9<sup>th</sup> graders; four year program
- Skills development (CSU SAI & Project Lead the Way, MESA)
- Competitions (MATE, Rube Goldberg, JPL, Aerospace Corp, Raytheon, MESA)
- Playing Up (Community College Co-Enrollment)
- Summer Engineering Programs (UCLA, RPI, Cornell, MIT, others)
- Industry Exposure & Linkage (site visits, internships, job shadowing, and corp curriculum development)

# Plans to expand the Engineer Factory Village in 2020 cont'd

## STEAM DAYS

- Goal: conduct 10-12 STEAM Days in 2020
- Elementary, Middle or High Schools
- CSULB has committed to a campus STEAM Day in March 2020
- Others?

## Expanded CSU Summer Algebra Institute

- LA Southwest College will host
- Expand from 50 to 125 middle and high school students
- At least 25 students will earn college credits
- STEM project will include: ROVs, Drones and STEMPilot

**Questions?**

# Want to join the Engineer Factory village?

Schedule a consultation at your site today! Contact:

Audrey Thompson, Executive Director

[audrey@theengineerfactory.org](mailto:audrey@theengineerfactory.org)

(310) 625-3710

[www.theengineerfactory.org](http://www.theengineerfactory.org)

We look forward to partnering with you!