



California State University, Dominguez Hills

# CSI<sup>3</sup> NEWS

CA STEM Institute for Innovation & Improvement, CSI<sup>3</sup>



## Harnessing Potential: Unleashing Student Energy

**"WE WANT TO CULTIVATE THEM INTO 21ST CENTURY LEADERS AND LIFELONG LEARNERS."**

**-JAMES BORDEN, CSI<sup>3</sup> STEM Lab School Coordinator**

At the CSI<sup>3</sup>'s STEM Lab School culmination, the student narrated his team's roller coaster assignment as his peers demonstrated their project's scientific nuances: "If you [were to] place the marble at the high point of the track, then you [will] have stored the maximum potential energy necessary for it to travel down the tubing to the cup at the end. You have to balance the potential and kinetic energy in order to ensure the trajectory will land the marble in the cup. But to stop it from overshooting the cup, you must introduce loops that will use up some of the kinetic energy." The marble was dropped. It effortlessly slid down the "roller coaster's" foam track, speeding and slowing at precisely predetermined moments. It coasted gently into the cup.

When they had finished their demonstration, he and his team triumphantly affirmed that they could not wait until they were old enough to attend high school.

They were not alone. The auditorium at Phineas Banning High School, Wilmington CA was filled with the Lab School's grand exhibition of its project-based learning curriculum, which trades memorizing textbooks for hands-on assignments that merge Mathematics and Science with real-world, relatable applications. All of the pre-high school student teams achieved similar success with their roller coaster exhibits. The Lab School's instructors carefully and solemnly examined the projects and their scientific rationale, nodding as each student team proudly answered their various questions. For the students, their pride and enthusiasm were both naturally felt and articulated: "The [STEM Lab School] program made everything more real. We would definitely recommend this to others. The teachers were all amazing!" Their enthusiasm arose as an organic product of the project-based learning that had been the cornerstone of the STEM Lab school's curriculum.

The parents stood agape at their children's rapid and monumental progress. One of them, Elaine Bishop, expressed her amazement, "I have had such a hard time motivating [my son] to go to school. But now? He is so eager. He is connecting the dots!" When asked to what she credited her son's newfound love for education, Bishop declared, "It's the Lab School. He's never done anything like this before: He and all of his friends can see the end product. You know, he told me he was 'only going to go for the first few days?' Well, now he's looking forward to next year!" Even a casual observer could see that Bishop would eagerly help her son to do the program again, if only to keep stoking his fiery love for learning.



Roller coasters being assembled to test principles of Mathematics and Physics.



**“ALL THESE KIDS NEEDED WAS THE RIGHT MOTIVATION AND AN AWESOME PROGRAM.” -DAN CASTILLO, Parent**

The students' energetic commitment to their own education was put on full display in the auditorium, and they happily provided their testimony during the awards ceremony. One student speaker proclaimed, "The program has taught me so much about teamwork and community. Thank you to the teachers." Following up on her evidence, another student supplied, "You know, none of these subjects had been my favorites before the program. Now, I know how to resolve problems on my own." Through a powerful community and program that aimed at excellence, the students had internalized the lessons of Science, Technology, Engineering, and Mathematics and had successfully translated them into lifelong lessons. Specifically, they were learning to take charge of their own learning, to set their own goals, and to accomplish them.

And that is no accident, as James Borden, CSI3 Academic Coordinator for CSUDH STEM Lab School, knowingly attested: "We employ a relevant curriculum that exposes the students to modern day standards, equipment, and techniques. We want to cultivate them into 21st century leaders and lifelong learners that serve the community and whose integrity and leadership are held together through support and collaboration. They should be proud of their



Gustavo Ferreyra, Fab Lab Coordinator, assisting students with creating their projects' materials.

excellence, since they have learned the value of education. Those are our core values." And, cutting to the essence, the heart of the Lab School, Borden added, "We will make the next generation standards possible. The tools may be new, but our value system is the same: Students should have the opportunity to go to college." The heart and soul of the program genuinely resonated with all of its participants, and parents could not help but provide further commentary.

Dan and Diana Castillo, parents, shared some of their observations about the Lab School's significance. Diana Castillo intimated, "Our little one didn't want to come initially – but her perspective has changed. She wants to take the tools and to learn." Dan Castillo nodded, adding, "The idea of introducing this type of learning at this age... Well, it pushes the envelope. All these kids needed was the right motivation and an awesome program. People need to see this at schools like this."



All members of the family were invited to test the students' designs.

**“THESE STUDENTS ARE MOTIVATED TO LEARN,  
AND, NOW, WE CAN ALL EXPLORE THE FUTURE  
TOGETHER.” -RUDY MENDOZA, Principal**



Teacher and students choosing materials for their projects.

United by the common purpose to build bridges - to give the students the opportunities they need - students, parents, teachers, and program administrators all bonded together to create paths to, success.

Speaking to the bridges that had been made, Rudy Mendoza, principal of Phineas-Banning High School, commented candidly, “Dr. Hamdan’s staff has been phenomenal, and when he talks about programs, he helps us to think innovatively for our students. Have you heard them speak? They’re using academic vocabulary. It has all come together: These students are motivated to learn. And, now, we can all explore the future together.” Shirley Guzman, the vice principal, elaborated, “It’s so exciting to see the students learn the reason why they should learn Math and Science – really, all of the content areas. They haven’t been given opportunities to see how

and why everything connects, until now. Look at their faces. Their confidence speaks volumes.” At the end of the day, for both of them, the proof was exemplified by their students.

The students, young though they were, carried a maturity and appreciation for STEM about them that could only be described as a serious commitment to education, learning, and community improvement. The students seemed to swell with pride and ambition as they shared their learning with their fellow students, families, and the community of teachers, administrators, and Lab School staff that had joined together to model a culture of growth and excellence. At the event’s conclusion, the entire program seemed to call upon the students to become leaders themselves and to embody the program’s core values.

As the students and their families slowly exited the auditorium, their certificates of completion in hand, no tears were shed. At such a heartfelt and emotionally charged culmination, some melancholy might be expected; their joyful program was over. But, no. After all, they knew that they would soon work together again as a team in order to learn together. They could form those bridges. It seems that, through their Physics lessons, they had learned that they only needed the opportunity to harness their potential in order to drive forward into their futures.