



Case Study

Greenfield Builds College and Career Readiness
with STEMscopes CA NGSS 3D

Greenfield, California

Greenfield Union School District (GUSD) is committed to ensuring the “Greenfield Guarantee,” which is that ALL students will learn and achieve at high levels in order to be college and career ready. The rural district resides in the city of Greenfield in southern Monterey County, Calif., which boasts a strong agricultural presence and history.

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THE CHALLENGES

“Greenfield is a Title I district,” said Shelley M. Duttarer, the district science coach for GUSD. “We have a high percentage of students who receive free and reduced lunch, a high ELL population, and a high migrant population. Students come to us not having the vocabulary, academic language, and background knowledge that their peers do in other cities in this area. The problem is access; it’s not equitable. This makes college and career readiness far more challenging.”

Understanding the district’s challenges, Assistant Superintendent of Educational Services Laura Cortez has made science instruction a priority in the Greenfield Union School District. “We are a Preschool through 8th grade district, and every child is afforded the opportunity to experience hands-on science,” said Cortez.

“Kids need to have access to science,” said Duttarer. “It’s not just about giving teachers the training and materials to teach the Next Generation Science Standards (NGSS); it’s about giving students the tools to drive their own inquiry. The standards provide the framework, but how do you connect that to student access and make it equitable for every child?”

“We have built a culture where science, technology, arts, music, etc. are just as important as reading and writing,” said Cortez. “All of our teachers and administrators support science instruction as they would any other subject.”

THE STEM SOLUTION

After the State Board of Education adopted the California Next Generation Science Standards (CA NGSS) in 2013, GUSD decided to find a new science curriculum to inspire and equip students with the knowledge and skills to become college and career ready.

“We reviewed several programs that claimed to be NGSS-aligned, but STEMscopes was the only one that was actually built to meet the NGSS and rooted in the 5E model of inquiry,” said Duttarer.

After successfully piloting the STEMscopes digital STEM curriculum at the middle school level in 2015, GUSD expanded its implementation district-wide in fall 2016. Today, it uses STEMscopes CA NGSS 3D in all schools in grades K-8. It also implements STEMscopes Early Explorer in transitional kindergarten (TK).

Implementing a phenomena-based, three dimensional STEM curriculum

STEMscopes CA NGSS 3D is built on the CA NGSS and aligned to the California Science Framework. It is centered on phenomena-based instruction to drive student inquiry and a passion for STEM, while helping students prepare for the California Science Test (CAST). The curriculum, which was adopted by the California State Board of Education in 2018, is also available in Spanish for grades K-12.

“We are incredibly excited to integrate and intentionally focus on STEM, robotics, and engineering in the everyday life of our PreK-8th grade Greenfield students,” said GUSD Superintendent Zandra Jo Galván. “We are intentional about designing experiences for our elementary and secondary students to explore, analyze, and engage in deep learning and collaborative dialogue that promotes their critical thinking. We want them fully prepared for the plethora of college and career post-secondary opportunities ahead of them. We are proud to partner with STEMscopes and to use their curriculum to watch our children thrive with every such experience!”

Supporting teachers

In addition to student learning modules, the STEMscopes curriculum includes embedded support for teachers — such as lesson plans, professional development videos, on-demand webinars, and how-to guides — to help them continuously improve their teaching.

“STEMscopes made it easier for our teachers to facilitate and our district to support the implementation of the NGSS,” said Duttarer. “It helped our teachers become familiar with the new standards, and it provided the tools and resources to help them teach to the rigor of the standards and make them accessible to all students.”

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Implementing the 5E+IA lesson model

Each unit or “scope” in STEMscopes is developed around the 5E (Engage, Explore, Explain, Elaborate, Evaluate) model of instruction, with additional phases for Intervention and Acceleration. This helps create deeper learning experiences that engage students with all areas of the CA NGSS.

“STEMscopes makes it simple for teachers to implement the 5E model, and the hands-on learning makes it engaging for students,” said Duttarer.

To further bolster student learning, GUSD created Wonder Wednesdays with a 90-minute block dedicated to STEM. “Teachers like to use the STEMscopes hands-on kits for the Explore phase of the 5E model on Wonder Wednesdays,” she said. “Students look forward to Wonder Wednesdays because they’re so focused on hands-on exploration.”

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Conducting distance learning in STEM

When California issued a shelter-in-place order in March 2020 due to the COVID-19 pandemic, GUSD moved to distance learning, which has continued into the 2020-21 school year. “COVID-19 presented a whole new set of equity issues for our students,” said Cortez. “We were not a 1:1 district yet and even if we were, not all families had WiFi capability at home to access lessons at home.”

“Since then, we have achieved 100% connectivity for all of our students, which is something that was a HUGE collaboration at all levels of our organization. We are grateful to have so many GUSD team members that love our Greenfield students and

families and do whatever it takes to ensure they succeed,” said Galván.

As the district science coach, Duttarer regularly uses the STEMscopes distance learning hub to access lessons and guidance for using the curriculum in synchronous and asynchronous learning. In addition, teachers use a variety of STEMscopes distance learning tools to keep the learning going.

Using the STEMscopes Virtual Learning Videos, for example, GUSD teachers can engage students in hands-on learning in the classroom or at home. With embedded teacher talk, questioning, and instructional modeling, students can follow along and participate in activities from anywhere. Each standalone mini-lesson includes handouts, virtual and printable manipulatives, and comprehension questions. The teacher-led instructional videos are also assignable to individual students or across an entire school or district.

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“STEMscopes is a living curriculum. The changes that are being made and the resources that are being added to support distance learning are so helpful,” said Duttarer. “STEMscopes also has tools, like the PhET simulations, that have always been there but are being used a lot more now with distance learning.”

To meet the needs of its most vulnerable students, in November 2020 GUSD opened its schools for in-person learning for small groups in preschool, TK, and special day class [for students in special education]. “The special day class teachers know their students need high-quality materials to prepare for college and careers, and STEMscopes places them right at their fingertips,” she said.

Helping students become college and career ready

“With STEMscopes, our students have developed a stronger understanding of STEM concepts and their learning is more inquiry-based. We are extremely proud of where our partnership has taken GUSD,” said Duttarer.

“We have an ALL means ALL commitment in Greenfield and work to ensure that each student who comes through our doors receives our commitment to fulfilling the Greenfield Guarantee. We are committed to ensuring both access and equity in our journey of college and career readiness for ALL the students we serve,” said Galván.