



# to Success

## BACKGROUND

California's public schools, K-12 are undergoing a multi-year planning process from 2013-2018 for Next Generation Science Standards (NGSS) that moves from the traditional science teaching method of rote memorization of facts and lecturing towards a process of inquiry and investigation to help students form a deeper understanding of how science applies to their lives.

Next Generation Science Standards are rich in environmental sciences and lessons about human impact. Yet, Contra Costa teachers lack resources and materials aligned with the NGSS and students are in need of real-life applications that engage and inspire.



## WHAT IS DRIVING THE NGSS



- U.S. is losing its competitive edge
- Lagging achievement of U.S. students
- Essential preparation is needed for modern workplaces



**JOHN MUIR  
LAND TRUST**



# SOLUTION

Recognizing the value of hands-on learning in one's own backyard and the allure of mobile phone technology, John Muir Land Trust (JMLT) partnered with Canogle, Inc., Contra Costa County Office of Education, National Parks Service and Tesoro Corporation to establish the program, *POINTING to Success*. *POINTING to Success* integrates NGSS lessons with GPS-based audio tours located at JMLT's properties. The lessons and tours enhance STEM learning by focusing on local ecosystems and creating opportunities for students to explore local phenomena both in the classroom and in the "real-world."

## TARGET POPULATIONS

*POINTING to Success* targets underrepresented populations in STEM including girls, Latino and African American students and low-income Contra Costa County school districts. The program engages any student who is currently disengaged or underperforming in science because classroom material lacks relevance to their lives.



## PHASE I

Kicked off in October, 2015, Master Teachers from Martinez, Antioch and San Ramon Unified School Districts connected over 300 middle and high school students to JMLT's Fernandez Ranch using Canogle's POINT tours, *A Stroll Back in Time* and *A Walk on the Wild Side*. Students ranged from Advanced Placement Biology to developmentally challenged (e.g. autistic) and represented ethnic and gender diversity. For many, it was their first time experiencing the outdoors in a large open space. In the field students increased their capacity to embrace STEM themes, such as how human activity impacts air and water and why open space is so important to our life-sustaining environment.

**SURVEY RESULTS** from 140 student respondents indicate program effectiveness in these areas:

- The Project helped me relate my science class to real world issues- 79%
- The Project increased my understanding of science concepts taught in class- 76%
- With the Project, I have new insight on open space & stewardship responsibilities- 77%

## PHASE II

During the 2016-2017 academic year, over 400 students from 6 unified school districts and the Orin Allen Youth Rehabilitation Center in Byron will learn about local ecosystems through the new app, *Wonders of Mount Wanda* developed by *POINTing to Success*' very own Master Teachers and Canogle. For added effectiveness, the tour is narrated by a youthful female voice and poses open-ended questions to stimulate critical thinking.

**WONDERS OF MOUNT WANDA TOUR TOUCHES UPON THE 3-DIMENSIONS OF THE NGSS:**

1. Scientific & engineering practices (questioning, investigating, designing solutions)
2. Crosscutting concepts (cause & effect, energy & matter, stability & change)
3. Disciplinary core ideas (motion & stability, energy, ecosystems, and earth & human activity)

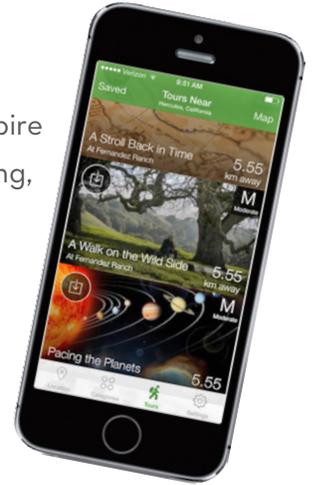


## STUDENT PRESENTATIONS

*POINTing to Success'* combination of field trips and GPS-based audio tours inspire research-oriented student projects that build competencies in team-building, collaboration, critical thinking, and problem-solving.

### Sample of Phase 1 Student Presentations:

- Carrying Capacity & Interdependent Relationships at Fernandez Ranch
- How to Sustain the Biodiversity of the Ecosystem at Fernandez Ranch (or anywhere else on our planet)
- Conservation Efforts & Development



Through experiential learning, JMLT is breaking barriers to understanding and providing innovative educational tools for teachers aligned with Next Generation Science Standards!

Funding Provided By:



POINTing to Success is a Collaborative Partnership



P.O. Box 31, Martinez CA 94553 • 925-228-5460 • info@jmlt.org • jmlt.org



**BREAKING BARRIERS WITH INNOVATIVE TEACHING TOOLS**  
**EXPERIENTIAL LEARNING**