

SAMOHI Science Sequence

February 19, 2021

Why Physics First?

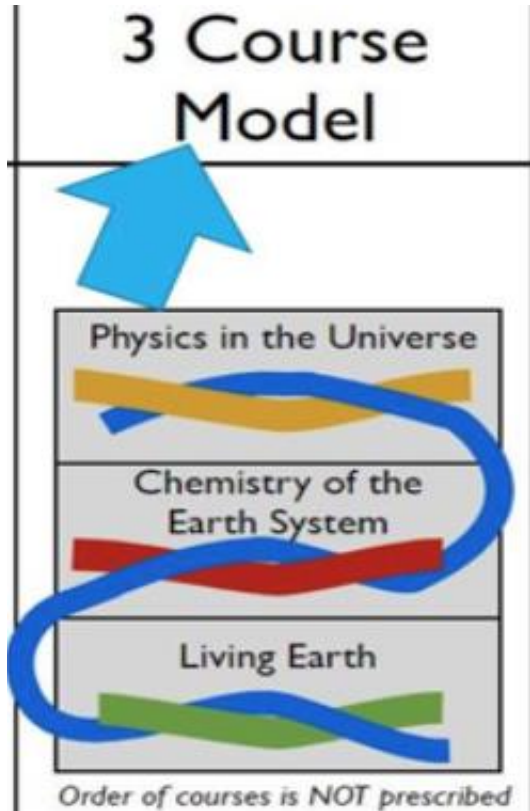
Physics - Chemistry - Biology sequence builds a strong foundation and provides students the opportunity to construct their scientific knowledge and understanding in a logical, coherent manner

- Samohi Class of 2021: **38.7%** (279/720) students took any level of Physics (P or AP)
 - Class of 2020: **26.8%** (185/691) students took any level of Physics
 - Class of 2019: **29%** (213/725) students took any level of Physics
 - → **more than 60% of Samo students do NOT take any Physics**
- Physics is the most fundamental and all-inclusive of the science, and has had profound effect on all scientific development. (Bouma, C.E., 2013)
- Chemistry is based on charge structure of atoms and forces between charges (Physics)
- Understanding function of DNA (Biology) requires understanding in Chemistry, Physics
- **A 9th grade Physics course starts with concrete experiences from students' daily lives and motivates students to learn more math tools.**
 - Provides students with opportunities for further STEM and AP science studies

“Every Science, Every Year”

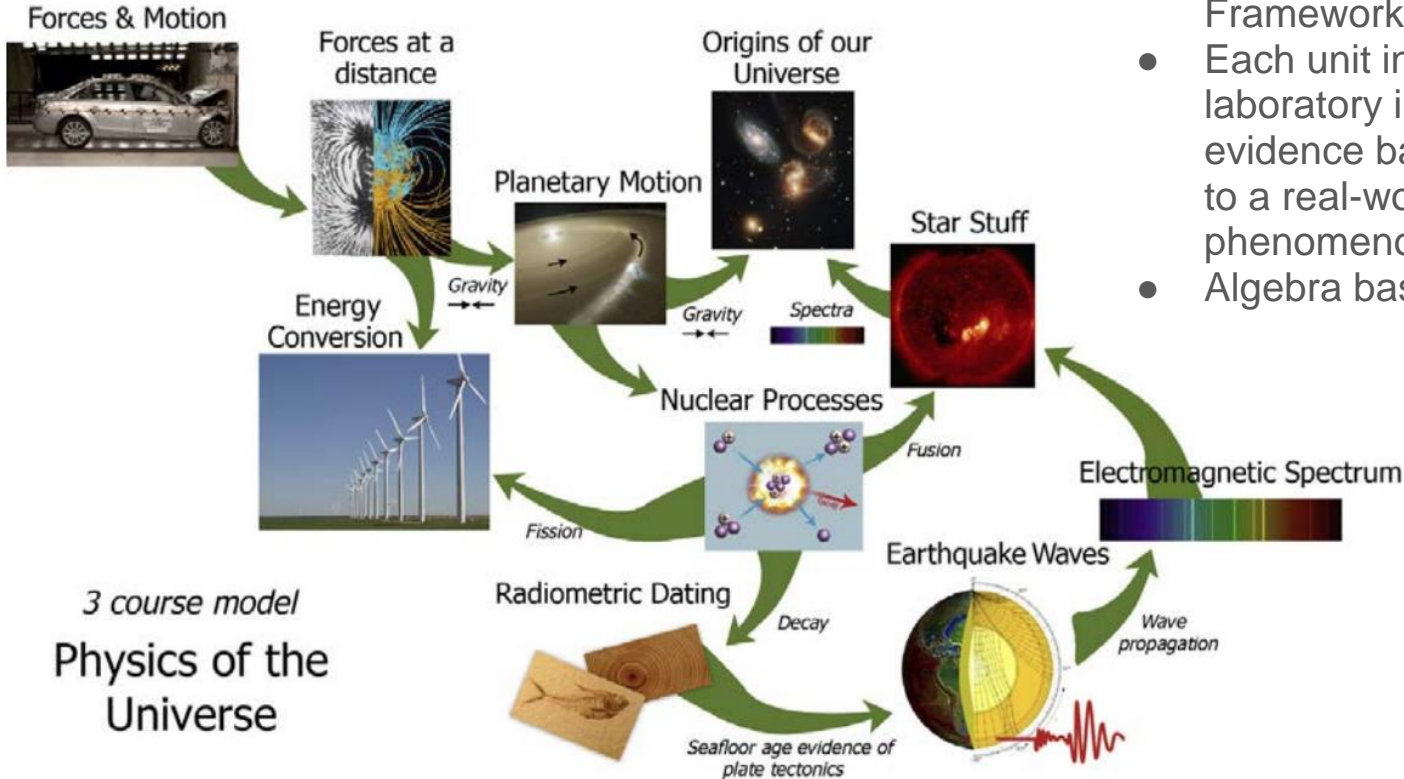
Three-course model: earth and space sciences phenomena motivate in-depth study of other science disciplines. The three courses are titled to emphasize the synergy between disciplines.

(CA Science Framework, 2018)



- Physics teaches HOW science works (Central to NGSS)
- Physics empowers sense making (Student Centered)
- Allows for inquiry based teaching (Teacher facilitates learning through questioning)
- Physics provides key concepts for chemistry, biology, astronomy, earth science, medical science
- Increased coherence across science curriculum
- Increased enjoyment of science
- NGSS has eliminated complex math for more depth.
 - Reinforce Algebra concepts with real life applications.

Physics of the Universe



3 course model
Physics of the
Universe

- Integrates Physics, Earth Science, and Engineering Practices based upon the NGSS California Science Framework
- Each unit includes hands-on laboratory investigation that is evidence based and connects to a real-world application or phenomenon
- Algebra based

Physics of the Universe

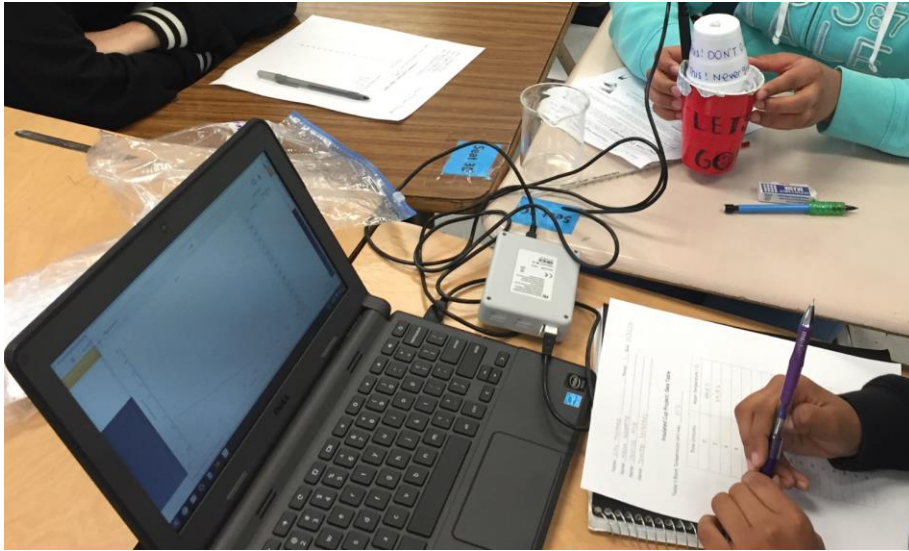


Connections to ELA and Math daily!

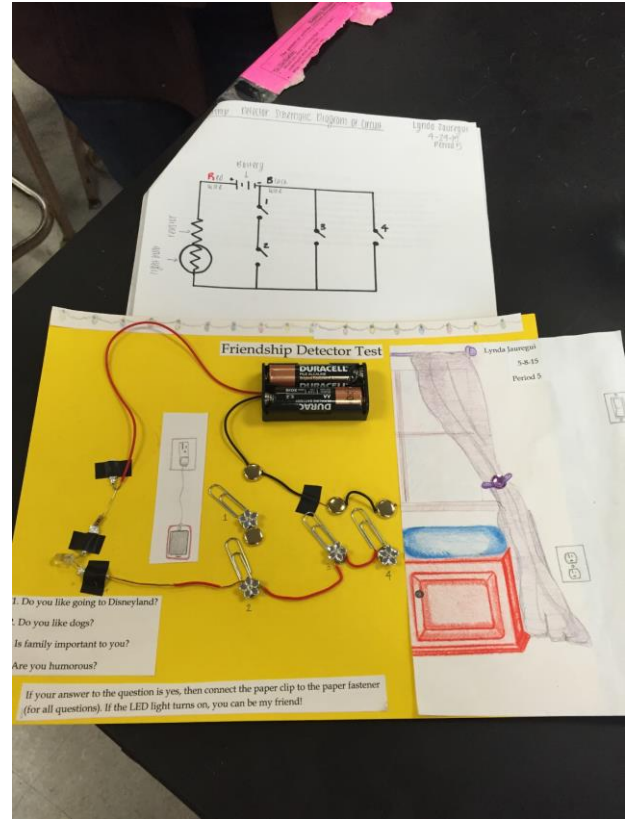


Designing and building paper Roller coasters during unit on Energy

Physics of the Universe



Integrating Chromebooks and Vernier probes to test insulated cups students design



Friendship Detector Project: Students design, build and test circuits

Current Sequence (Biology First)

Grade	Pathway A	Pathway B	Pathway C
9 th	Biology of the Living Earth P	Biology of the Living Earth P	Chemistry of the Earth System HP (Summer EdAhead Biology)
10 th	Chemistry of the Earth System P	Chemistry of the Earth System HP	Chemistry AP or Biology AP
11 th	Physics of the Universe P	Physics of the Universe P or Physics1 AP	Chemistry AP or Biology AP Physics 1 AP or Physics C AP
12 th	Marine Biology P Physiology P Biology AP Environmental Science AP Chemistry AP Physics 1 AP Physics C AP	Marine Biology P Physiology P Biology AP Environmental Science AP Chemistry AP Physics C AP	Marine Biology P Physiology P Environmental Science AP Chemistry AP Physics 1 AP Physics C AP Physics E+M AP

Physics First Sequence (Full implementation 2022-2023)

Grade	Pathway A	Pathway B	Pathway C	Pathway D*
9 th	Physics of the Universe P	Physics of the Universe P	Physics of the Universe P	Chemistry of the Earth System HP (Summer EdAhead Physics P)
10 th	Chemistry of the Earth System P	Chemistry of the Earth System HP	Chemistry of the Earth System HP AND Biology AP	Biology AP
11 th	Biology of the Living Earth P	Biology of the Living Earth P or Biology AP	Chemistry AP or Physics 1 AP or Physics C AP	Chemistry AP or Physics 1 AP or Physics C AP
12 th	Marine Biology P Physiology P Biology AP Environmental Science AP Chemistry AP Physics 1 AP Physics C AP	Marine Biology P Physiology P Biology AP Environmental Science AP Chemistry AP Physics 1 AP Physics C AP	Marine Biology P Physiology P Environmental Science AP Chemistry AP Physics 1 AP Physics C AP Physics E+M AP	Marine Biology P Physiology P Environmental Science AP Chemistry AP Physics 1 AP Physics C AP Physics E+M AP

*pending on availability of EdAhead Physics courses

Questions?