

## HEROS for Zero California NGSS Alignment

The standards listed below are from the California NGSS Framework. The competition will address a component of the standards listed below.

### **Elementary (K-5)**

#### *Kindergarten through Grade 2*

- K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

#### *Grade 3 through Grade 5*

- 3-5-ETS1-1. Define a simple design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

### **Middle Grades (6-8)- Integrated Model**

#### *Grade 6 (Instructional Segment 4 in CA Framework)*

- MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (Integrated with any of the MS-ETS listed below)
- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

#### *Grade 7 (Instructional Segment 3 in CA Framework)*

- MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

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### *Grade 8 (Instructional Segment 4 in CA Framework)*

- MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

### **High School (9-12) – 3-Course Model**

#### *Physics of the Universe (Instructional Segment 3 in CA Framework)*

- HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. (Integrate with HS-ETS1-3)
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

#### *Chemistry in the Earth Systems (Instructional Segment 5 in CA Framework)*

- HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. (Integrate with HS-ETS1-3)
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

#### *Living Earth (Biology) (Instructional Segment 3 in CA Framework)*

- HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. (Integrate with HS-ETS1-3)
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.