



HSA-Alt Teacher Resource Guide—Grade 11 Science Classroom Embedded Assessment

The HSA-Alt Classroom Embedded Assessment (CEA) is a non-mandatory assessment option available to HSA-Alt-identified students. The CEA is designed for students who have an established communication system. Although non-responsive students are allowed to take the assessment, the assessment is ideally suited for students who are able to attend to stimuli, engage in activities, and demonstrate understanding through actions, gestures, symbols, signs/signing, a communication device, or speech.

The CEA offers a model of standards-based instruction and supports, leading to progress toward year-end targets for learning found in the [HSA-Alt Range PLDs](#). Each CEA testlet is aligned to a single standard and features scripted instructional activities and assessment items at five performance levels in prerequisite, well-below, approaching, meets, and exceeds level of performance for students.

CEA testlets include teaching activities and performance tasks, which are available to download in the General Resources section in TIDE. It is recommended that teachers download the testlets and read them with the accompanying Teacher Resource Guides.

As a classroom assessment, the CEA offers greater flexibility than a summative assessment. The CEA may be individualized in the following ways to meet student needs:

- Teachers may select the most appropriate performance level for administration of each CEA for each student. Teachers can administer one or more levels for each session based on the student's instructional level.
- Teachers have up to five opportunities to administer each subject area CEA during the testing window (October 3, 2022–July 21, 2023). The complexity level of each administration may be the same or higher than the previous administration.
- It is recommended that teachers provide the same accommodations on the CEA as are utilized during classroom instruction. The scripted language and materials in the CEA may be modified to support student comprehension.
- For some students, an individually administered assessment may not be necessary. Teachers may administer the CEA to these students in small groups using PDF testlets, which include teaching activities and performance task items. PDF testlets are available at www.hitide.org.

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Targeted Hawaii Next Generation Science Standards and CEA Targets

Next Generation Science Standards (NGSS)				
HS-LS2-2: PE: Ecosystems: Interactions, Energy, and Dynamics: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.				
Essence Statement: Identify the interdependence of organisms and use data ¹ to explain patterns and trends between a population and the availability of resources.				
Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)			Crosscutting Concepts (CC)
<p>Using Mathematics and Computational Thinking Mathematical and computational thinking in 9-12 builds on K-8 experiences and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions. → Use mathematical representations of phenomena or design solutions to support and revise explanations.</p> <p>Scientific Knowledge is Open to Revision in Light of New Evidence Most scientific knowledge is quite durable, but is, in principle, subject to change based on new evidence and/or reinterpretation of existing evidence.</p>	<p>LS2.A: Interdependent Relationships in Ecosystems Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. These limits result from such factors as the availability of living and nonliving resources and from such challenges such as predation, competition, and disease. Organisms would have the capacity to produce populations of great size were it not for the fact that environments and resources are finite. This fundamental tension affects the abundance (number of individuals) of species in any given ecosystem.</p> <p>LS2.C: Ecosystem Dynamics, Functioning, and Resilience A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.</p>			<p>Scale, Proportion, and Quantity Using the concept of orders of magnitude allows one to understand how a model at one scale relates to a model at another scale.</p>
Skill Levels				
Prerequisite Skill	Well Below PLD ²	Approaching PLD	Meets PLD	Exceeds PLD
Recognize a plant or animal.	Recognize the needs of a common plant or animal.	Identify the interdependence of two or more organisms in an ecosystem.	Use data ¹ to explain the patterns and/or trends between population size and the availability of resources.	Given a graphical representation of data, predict the change in the size of a population as another environmental factor changes.

1. Note: Data may be in the form of tables or graphs.

2. PLD: Performance Level Descriptor

Performance Level Materials and Supports

All graphics and printouts in the Materials Lists below are available to download as PDF posters from the Hawaii TIDE site (<https://www.hitide.org>) in the General Resources > Download Forms section.

Prerequisite Level: Materials List

Materials List:

- Pictures of monk seals
- Pictures of aquatic plants native to Hawaii
- Picture of one monk seal, one reef triggerfish, kelp, and algae
- t-chart

Well Below Level: Materials List

Materials List:

- Picture of monk seal
- Pictures of food monk seals eat (fish), beach area, ocean water, air
- Pictures of plant needs—sunlight, watering can, soil
- Pictures of people needs—shelter, food, glass of water
- t-chart

Approaches Level: Materials List

Materials List:

- t-chart of People and Plant Needs from Well Below activity
- Picture of monk seal from Well Below activity
- Picture of triggerfish
- Picture of algae
- Big printable of monk seal head with open mouth
- Medium printable of triggerfish head with open mouth

Meets Level: Materials List

Materials List:

- Pictures of resources for monk seals: food monk seals eat (reef fish, octopus, lobster, etc.), beach area, ocean water
- Graph of population numbers of monk seals in Hawaii until 2010
- Graph of downward trend of available land over time

Exceeds Level: Materials List

Materials List:

- Graph of monk seal population decline from Meets activity
- Updated graph of monk seal population noting a fish protection law in 2015
- Picture of food monk seals eat

Academic Vocabulary Used in This Testlet

algae. A plant found in bodies of water.

conclusion. A decision reached after reasoning (i.e., looking at data, discussing information, etc.).

data. Facts gathered together for reference.

environment. The surroundings in which an organism lives; also used as a general term to describe the natural world.

graph. A diagram that shows the relationship between two variables

impact. To have an effect on something.

law. a rule from the government defining certain behaviors and actions

native. a descriptive word (such as “native plant”) used to identify an organism that has occurred naturally in a particular area for a long time

organism. an individual plant or animal

outcome. The end result of actions

population. A group of organisms that live in the same place

predict. To estimate something in the future; an educated guess on what will happen

resource. A substance in the environment required by an organism to survive (e.g., food, water)

sea level. The height of the ocean surface, relative to the nearby land. Sea level change is a measurement of how much and how quickly that height has increased or decreased over time.

species. A group of similar organisms who can reproduce naturally

survive. Continue to live

t-chart. A diagram that separates information into two columns

trend. The general direction in which something is changing

Standard Core Concept

Ecosystems have carrying capacities resulting from biotic and abiotic factors. The fundamental tension between resource availability and organism populations affects the abundance of species in any given ecosystem. If a biological or physical disturbance to an ecosystem occurs, including one induced by human activity, the ecosystem may return to its more or less original state or become a very different ecosystem, depending on the complex set of interactions within the ecosystem.

Associated Below Grade-Level Dimensions

The **Disciplinary Core Ideas** for this standard are LS2.A, Interdependent Relationships in Ecosystems and LS2.C, Ecosystem Dynamics, Functioning, and Resilience. These topics build on a student's understanding of the interactions of organisms in an ecosystem. Students should be familiar with these concepts from middle school:

MS-LS2-1

Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. (HSA Alternate Essence Statement: Recognize organisms or environmental factors; identify factors in an ecosystem that impact organisms, including factors that cause population changes; and/or use data to describe how population changes impact available resources.)

MS-LS2-2

Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. (HSA Alternate Essence Statement: Recognize one or more organisms interacting with its (their) environment, identify interactions within and across ecosystems, and/or use data showing cause-and-effect interactions₁ to predict the impact of a change in the population of a species.)

MS-LS2-3

Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (HSA Alternate Essence Statement: Recognize that food webs include producers, consumers, and decomposers; complete a food web that includes common organisms; demonstrate the flow of energy in a food web; and/or use a model to show energy flow within an ecosystem.)

MS-LS2-4

Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. (HSA Alternate Essence Statement: Recognize an ecosystem; identify components of an ecosystem; use data to determine the effect of limited resources on a population; and/or predict the impact of a change in the population or physical environment of an ecosystem and recognize that changes to any physical or biological component of an ecosystem can lead to population shifts.)

The **Science and Engineering Practice** for this standard is Using Mathematics and Computational Thinking. At the high school level, it builds in part on a student's mathematical thinking skills, to:

- Use mathematical representation of phenomena (NGSS Appendix F).

The **Crosscutting Concept** for this standard is Scale, Proportion, and Quantity. At the high school level, it builds on a student's skills to:

- Recognize observable patterns, and
- Understand the significance of a phenomena is dependent on scale and quantity (NGSS Appendix G).

Accommodating Individual Student Needs on the CEA

It is highly recommended that students receive the same accommodations on the CEA as they receive during classroom instruction.

Manipulatives

Manipulatives may aid student understanding, engagement, and ability to focus on the concepts in this testlet. Objects representing plants and animals (i.e., algae, kelp, monk seals, triggerfish, reef fish, octopus, and lobster) and objects to represent needs (i.e., sunlight, water, soil, shelter, food) can be used to demonstrate this standard.

Physical Action

Encourage the student to interact with instruction and make choices using a preferred mode of communication. If the student is not able to interact with the instruction verbally or physically (e.g., manipulating or pointing to objects or graphics), consider other ways that the student could indicate a choice. Always make sure to provide enough wait time for the student to respond.

Picture Symbols, Sign Language, Augmentative and Alternative Communication (AAC) Devices

Ensure that the student is able to use a preferred mode of communication (verbalizing, pointing, gesturing, selecting picture symbols, using sign language or an AAC device) when interacting with the testlet. Pre-teach key vocabulary using the following strategies:

1. Introduce key vocabulary with associated graphics (illustrations or picture symbols).
2. Post the graphics in a place that is convenient for student viewing.
3. Repeat the vocabulary on a regular basis, using verbal cues.
4. Provide the student with opportunities to practice using the vocabulary.

Tactile Materials, Including Tactile Graphics and Tactilely Enhanced Objects

Tactile materials can be used to represent environmental concepts to a student with a visual impairment or a student who learns best through touch. Present graphs showing monk seal population and availability of land using tactile materials that are most familiar and engaging to the student.

Resources

Hawaii TIDE site: <https://www.hitide.org>

HSA-Alt CEA resources are available in General Resources > Download Forms at the bottom of the page.

HSA-Alt Participation Guidelines: <https://hsa-alt.alohahsap.org/resources/resources-2022-2023/hsa-alt-participation-guidelines-2022-2023>

Burnes, J. J., & Clark, A. K. (2021). Characteristics of students who take Dynamic Learning Maps® alternate assessments: 2018–2019 (Technical Report No. 20-01). University of Kansas, Accessible Teaching, Learning, and Assessment Systems (ATLAS).

https://dynamiclearningmaps.org/sites/default/files/documents/publication/Characteristics_of_Students_Who_Take_DLM_AAs.pdf

Universal design for Learning Instructional Units, NCSC’s ELA and mathematics instructional units for students with significant cognitive disabilities.

https://wiki.ncscpartners.org/index.php/UDL_Instructional_Units