

SCIENCE NVACS CONNECTORS GUIDANCE

Guidance for Nevada's teachers and high schools regarding the implementation of the Science requirements for the Alternative Diploma for students with significant cognitive disabilities



Introduction

This guidance document is designed to assist Nevada’s schools and teachers in the implementation of the Nevada Academic Content Standards (NVACS) Connectors in the science subject area. The Science NVACS Connectors in this guide are organized under the science topic area to which they are aligned, and include: 1.) Structure and Function; 2.) Matter and Energy in Organisms and Ecosystems; 3.) Interdependent Relationship in Ecosystems; 4.) Inheritance and Variation of Traits; and 5.) Natural Selection and Evolution. Each section of this guidance document is organized as follows:

1. Primary Heading - *Identifies science topic area*

Recommended Minimum Access Point – <i>Suggests a minimum point of access for students pursuing attainment of the NVACS Connectors</i>
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Definitions of Terms – <i>Defines terms within the Recommended Minimum Access Points for clarification and to ensure broad consideration of students’ ability to access the NVACS Connectors</i>

Science NVACS Connectors

NVACS No. – <i>Identifies the number for the Next Generation Science Standards from which the science NVACS Connectors are derived</i>

NVACS Connectors – <i>Identifies the NVACS Connector to guide content and instruction</i>
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The Nevada Department of Education’s Office of Special Education recognizes that students with significant cognitive disabilities (SCD) represent a broad diversity of abilities and support needs. In an effort to assist IEP teams in decision making and planning for the Alternative Diploma, we have developed the aforementioned Recommended Minimum Access Points as guidance. These recommended access points for students with SCD are intended to promote the broadest level of student access while also ensuring a high level of rigor in student programming.

1. Science Topic: Structure and Function

Recommended Minimum Access Point: Student can *access** various *representative models** of *life systems**

*access** - A student's ability to access curriculum materials should be considered within the broadest range of possible options and should consider: adaptations, modifications, and alternative versions of presentation and response.

*representative models** - Scientific concepts can be modeled and demonstrated to students in a variety of ways. Representative models may include: hands-on laboratory based instruction, visual models, manipulatives that represent scientific concepts, assistive technology applications and devices, etc. The broadest range of possible options for representations of scientific concepts should be considered.

*life systems** - Since DNA is the building block of all living things, life systems should be understood to encompass all living systems that may be represented to a student.

Science NVACS Connectors:

HS-LS1-1

Explain how the structure of DNA defines the structure of the protein which it codes (proteins carry out all life functions)

HS-LS1-2

Model at least two body systems in terms of their contributions to the overall function of the organism.

HS-LS1-3

Describe how negative and positive feedback mechanisms maintain body systems (homeostasis)

2. Science Topic: Matter and Energy in Organisms and Ecosystems

Recommended Minimum Access Point: Student can *access** various *representative models** of *energy use and matter** within *lived environments**

*access** - A student's ability to access curriculum materials should be considered within the broadest range of possible options and should consider: adaptations, modifications, and alternative versions of presentation and response.

*representative models** - Scientific concepts can be modeled and demonstrated to students in a variety of ways. Representative models may include: hands-on laboratory based instruction, visual models, manipulatives that represent scientific concepts, assistive technology applications and devices, etc. The broadest range of possible options for representations of scientific concepts should be considered.

*models of energy use and matter** - All living organisms must obtain and use energy to live. Matter can be broadly defined as everything in the universe. The broadest range of possible options for representations of energy use and matter should be considered.

*lived environments** - Lived environments should be understood to encompass all known habitats for living organisms.

Science NVACS Connectors:

HS-LS1-5

Describe how environmental factors affect the process of photosynthesis. (A series of chemical reactions that convert light energy into stored chemical energy)

HS-LS1-7

Reinforce the idea that the energy stored in food molecules originally came primarily from the sun's energy

HS-LS2-3

Compare aerobic (using oxygen) and anaerobic respiration (not using oxygen) in terms of the organisms that use the processes

HS-LS2-4

Apply the conservation of matter and energy to food webs

HS-LS2-5

Use diagrams to emphasize conservation of matter (carbon) as atoms move through the ecosystem

3. Science Topic: Interdependent Relationship in Ecosystems

Recommended Minimum Access Point: Students can *access** various *representative models** of *interdependent relationships** in a *lived environment**.

*access** - A student's ability to access curriculum materials should be considered within the broadest range of possible options and should consider: adaptations, modifications, and alternative versions of presentation and response.

*representative models** - Scientific concepts can be modeled and demonstrated to students in a variety of ways. Representative models may include: hands-on laboratory based instruction, visual models, manipulatives that represent scientific concepts, assistive technology applications and devices, etc. The broadest range of possible options for representations of scientific concepts should be considered.

*interdependent relationships** - Interdependent relationships should be understood to encompass any relationship between any two organisms where there is some form of shared reliance.

*lived environment** - Lived environments should be understood to encompass all known habitats for living organisms.

Science NVACS Connectors:

HS-LS2-1

Describe the role resource availability plays on carrying capacity (population an ecosystem can support)

HS-LS2-2

Describe how changes in an ecosystem may affect biodiversity and characteristics of populations

HS-LS2-6

Examine biodiversity and the relationships among ecosystems

HS-LS2-7

Explain how human activity may affect the environment and biodiversity

HS-LS2-8

Explain how group behavior can increase the chances for an individual and a species to survive and reproduce

HS-LS4-6

Use a simulation or model to describe the effectiveness of human solutions related to the loss of biodiversity

4. Science Topic: Inheritance and Variation of Traits

Recommended Minimum Access Point: Student can access various representative models related to the transmission of genetic traits

access* - A student's ability to access curriculum materials should be considered within the broadest range of possible options and should consider: adaptations, modifications, and alternative versions of presentation and response.

representative models* - Scientific concepts can be modeled and demonstrated to students in a variety of ways. Representative models may include: hands-on laboratory based instruction, visual models, manipulatives that represent scientific concepts, assistive technology applications and devices, etc. The broadest range of possible options for representations of scientific concepts should be considered.

transmission of genetic traits* - Gene transmission manifests in an infinite number of ways in the physical world. There are also a variety of illustrations and models of cellular processes related to gene transmission. The broadest range of possible options for representation of the transmission of genetic traits should be considered.

Science NVACS Connectors:

HS-LS1-4

Describe how cell division (mitosis) is a mechanism that allows organisms to grow, develop, and repair damaged tissue

HS-LS3-1

Explain the relationships among DNA, chromosomes, and traits observed in organisms

HS-LS3-2

Explain that during meiosis genetic information can combine in many different ways

HS-LS3-3

Use data to identify patterns and explain the distribution of an expressed trait when environmental variables change

5. Science Topic: Natural Selection and Evolution

Recommended Minimum Access Point: Student can *access** various *representative models** of *how things change over time**

*access** - A student's ability to access curriculum materials should be considered within the broadest range of possible options and should consider: adaptations, modifications, and alternative versions of presentation and response.

*representative models** - Scientific concepts can be modeled and demonstrated to students in a variety of ways. Representative models may include: hands-on laboratory based instruction, visual models, manipulatives that represent scientific concepts, assistive technology applications and devices, etc. The broadest range of possible options for representations of scientific concepts should be considered.

*how things change over time** - Critical to the theory of evolution is speciation, the formation of distinct species over time. Speciation is understood within an environmental context, by which the conditions of habitats and life circumstances promote biological change. Biological change over time should be considered the essential learning objective of this scientific area and broad latitude should be given to how it is represented.

Science NVACS Connectors:

HS-LS4-1

Explain that there is a significant amount of evidence (fossils, DNA/genetics, embryological patterns, vestigial organs, comparative anatomy) that shows organisms change over time through biological evolution

HS-LS4-2

Explain that evolution can occur due to natural selection

HS-LS4-3

Describe how traits, that allow organisms to better survive, are passed to offspring and over time are more common in a population

HS-LS4-4

Examine evidence that the rate of natural selection changes based on the environment and the population of organisms in that environment

HS-LS4-5

Explain that changes in the environment, which occur at different rates, can lead to the expansion of some species, the emergence of a new species, and the decline or extinction of some species

Using the NVACS Connectors to Inform Implementation

The Nevada Revised Statute (NRS) requires students pursuing the Alternative Diploma to attain a minimum number of high school credits (Table 1). ***The Science NVACS Connectors should be used to inform the content of a Life Science class. The Life Science class will fulfill one of the two required credits that are specified within the NRS.*** The NRS prescribes a minimum requirement of 2 science credits.

Table 1.

Credit Minimums for Graduating Cohorts 2022 and After

Required Course	Minimum Number of Units
Social Studies	2.0
Arts and humanities, Junior Reserve Officers' Training Corps (Level III or Level IV) or career and technical education	1.0
College and career ready flex credit (see notes below for details)	2.0
English language arts	4.0
Health education	0.5
Mathematics	3.0
Physical education	2.0
Computer use and technology	0.5
Science	2.0
Electives	6.0
TOTAL	23 Units

Note. The course of study in college and career ready flex credit must include:

- (a) Level II or Level III course of study in a program area prescribed pursuant to NAC 389.803 (*Career and Technical Education courses that are Level II and Level III fulfill this requirement*);
- (b) Fourth year of mathematics;
- (c) Third year of social studies; **or**
- (d) Third year of science.

According to NRS 389.018 the science course of study for a high school student must include two laboratory courses. ***The NVACS Connectors provide standards for only a Life Science credited course. Beyond establishing a Life Science course, schools and IEP teams have more flexibility in determining how they will meet the second science credit requirement for students with SCD.*** Nevada Administrative Code (NAC) 389.450 states that in addition to Life Sciences, the science course of study for a high school student may include:

- Earth Science;
- Physical Science; and

- Environmental Science

Considerable flexibility exists for schools in determining how the second science credit will be provided. Schools may determine the need to create a Physical Science class that integrates functional skills, or they may include students with SCD in an existing general education science class and modify the curriculum (Figure 1). Classes that are developed that seek to integrate functional skills should also align themselves to the Next Generation Science Standards with modifications to the curriculum necessary for student access. It is also important to note that one of the two required college and career ready flex credits can be a third year of science, and therefore may require schools to offer a third, year-long course in science for students with SCD. Delivery of the content required to meet the NVACS Connectors may occur in the general education setting with modified content, or it may occur in a segregated special education setting, depending on the least restrictive environment (LRE) determinations made by the IEP team.

Figure 1.

Example Four Year Course of Study Based on 2022 Requirements

Period	Freshman Year	Sophomore Year	Junior Year	Senior Year
1 st Period	ELA I (1 Credit)	ELA II (1 Credit)	ELA III (1 Credit)	ELA IV (1 Credit)
2 nd Period	Other Approved Math Area (1 Credit)	Algebra I (1 Credit)	Geometry (1 Credit)	
3 rd Period	Life Science (1 Credit)	Other Approved Science Area (1 Credit)	Elective Credit (1 Credit)	
4 th Period	Economics (.5 Credit) American Government (.5 Credit)	American History (1 Credit)	Elective Credit (1 Credit)	
5 th Period	Health Education (.5 Credit)	Physical Education (1 Credit)	Physical Education (1 Credit)	
	Computer Science and Applications (.5 Credit)			
6 th Period	Culinary I (1 Credit)	Culinary II (1 Credit) *Flex Credit	Culinary III (1 Credit) * Flex Credit	
7 th Period	Elective Credit (1 Credit)	Elective Credit (1 Credit)	Elective Credit (1 Credit)	Elective Credit (1 Credit)