

# ALTERNATIVE DIPLOMA PHYSICAL, EARTH, AND ENVIRONMENTAL SCIENCE GUIDANCE

Guidance for Nevada's teachers and high schools regarding the implementation of the Science credit 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 credit requirements necessary for a student to attain an Alternative Diploma. The Nevada Revised Statute (NRS) requires students pursuing the Alternative Diploma to attain a minimum number of high school credits (Table 1), including two credits in science. Currently, Nevada does not have approved NVACS Connectors in the science subject area; however, they only inform the creation of a Life Science course. This document provides suggestions for modified standards that align to the Next Generation Science Standards in the areas of Earth, Physical, and Environmental Science, which can be used to inform the content of science classes other than Life Science for students with significant cognitive disabilities (SCD).

**Table 1.**

### **Credit Minimums for Graduating Cohorts 2022 and After**

<b>Required Course</b>	<b>Minimum Number of Units</b>
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 Education and Technology	0.5
<b>Science</b>	<b>2.0</b>
Electives	6.0
<b>TOTAL</b>	<b>23 Units</b>

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

1. 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*);
2. Fourth year of mathematics;
3. Third year of social studies; **or**
4. Third year of science.

**Primary Heading** - *Identifies Science content area*

**1. Science Topic:** *Identifies Science topic area*

**Recommended Minimum Access Point** – *Suggests a minimum point of access for students pursuing attainment of the modified Science Standard*

**Definitions of Terms** – *Defines terms within the Recommended Minimum Access Points for clarification and to ensure broad consideration of students’ ability to access the modified Science Standard*

**Modified Standards**

**Standard No.** - *Identifies the number for the Next Generation Science Standards from which the science NVACS Connectors are derived*

**Modified Science Standard** – *Identifies the modified Science Standard to guide content and instruction*

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.

*\*Note: Earth Science Standards highlighted in red can also be used to inform the creation of an Environmental Science course when combined with certain Life Science Standards as described later in this document.*

## Earth Science

### 1. Space Systems

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of *space systems* and Earth's place within those 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.

*space systems\** - Space systems can be limited to those that occur within our own solar system. Space systems should be understood to encompass the broadest possible range of representation to allow students the greatest latitude in their engagement with Earth's place within those systems.

#### Modified Standards

##### HS-ESS1-1

Using a model, show how energy is produced in the sun and released toward the Earth

##### HS-ESS1-4

Model the location and motion of orbiting planets in the solar system

## Earth Science

### 2. History of Earth

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of Earth's history.

*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.

*Earth's history \** - Earth's history should be taught within the context of naturally occurring phenomena and focus on Earth's geological history.

### Modified Standards

#### HS-ESS1-5

Model how crustal plates are responsible for the movement of continents and how evidence of these movements and Earth's history can be found within crustal rocks

#### HS-ESS1-6

Using a model, show how planetary surface composition can be used to describe the history of the Earth, including Earth's formation

#### HS-ESS2-1

Using a model, show how natural forces construct (build), destruct (weather/erode) Earth's features

## Earth Science

### 3. Earth's Systems

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of the Earth and *Earth 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.

*Earth systems\** - The Earth contains various natural systems of processes and interactions that range from simple systems to highly complex systems. Earth systems should be understood to incorporate the widest possible range of representation to allow students the greatest latitude in their engagement with Earth science concepts.

#### Modified Standards

##### HS-ESS2-2

Using a model, show how changes in one Earth system can change other Earth systems

##### HS-ESS2-3

Using a model, describe the properties of Earth's interior layers and their effect on Earth systems

##### HS-ESS2-5

Using a model, show how the properties of water can affect Earth's materials and surfaces

##### HS-ESS2-7

Show how changes to the Earth result in changes to life on Earth

## Earth Science

### 4. Weather and Climate

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of Earth's weather and climate 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.

*Earth's weather and climate systems\** - Weather and climate manifest in a variety of ways within Earth's systems. Representations of weather and climate and their effect on other Earth systems should incorporate the widest possible range of representation to allow students the greatest latitude in their engagement with this Earth science topic.

### Modified Standards

#### HS-ESS2-4

Identify evidence that energy from Earth's systems results in changes in Earth's climate

## Earth Science

### 5. Human Sustainability

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of the *Earth and human interactions\**

*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.

*Earth and human interactions \** - The ways in which humans interact with the Earth and Earth processes are numerous and encompass individualized, localized interactions and larger, systems-based interactions. Earth and human interactions should be understood to incorporate the widest possible range of occurrences and representations.

#### Modified Standards

##### **HS-ESS3-1**

Show how access to natural resources and Earth changes influence human activity

##### **HS-ESS3-3**

Using a model, show how resources are managed to sustain human populations and biodiversity

##### **HS-ESS3-4**

Identify solutions that humans use to reduce their impact on Earth's natural systems

##### **HS-ESS3-6**

Using a model, show how human activity is changing the relationships between Earth systems



## Physical Science

### 1. Matter and its Interactions

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of *properties of matter\**

*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.

*properties of matter\** - Matter is everything. Matter can be described and presented to students based on molecular and/or physical properties.

### Modified Standards

#### HS-PS1-1

Using the periodic table as a model, identify common elements based on their atomic structure

#### HS-PS1-2

Using a model, identify the resulting compound from the combining of two or more elements in a chemical reaction

#### HS-PS1-5

Using a model, describe the reaction of molecules when the temperature of a substance increases and decreases

## Physical Science

### 2. Motion and Stability: Forces and Interactions

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of *force\**

*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.

*force\** - In scientific terms, a force is the push or pull on an object with mass that causes the object to change velocity. The exertion of force and its effect on an object or objects can be modeled in an expansive number of ways. Instruction should provide the broadest latitude of representation of force to provide students access to the curriculum.

#### Modified Standards

##### HS-PS2-1

Using a model, predict how force and an object's size will affect the object's acceleration

##### HS-PS2-3

Develop a device that reduces the force on an object during a collision

##### HS-PS2-4

Using a model, predict how gravity will affect an object's force in relationship to another object

##### HS-PS2-6

Using a model, show how the physical structure affects designed materials

## Physical Science

### 3. Energy

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of energy\*

*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.

*energy\** - In scientific terms, energy is the capacity to do work. The broadest range of possible options for representing energy and energy transfer should be considered.

#### Modified Standards

##### HS-PS3-1

Using a model, show how energy is transferred in a system with multiple parts

##### HS-PS3-3

Create a device that converts one form of energy into another

##### HS-PS3-5

Model how two objects interact in an electric or magnetic field

## Physical Science

### 4. Waves and their Applications in Technologies for Information Transfer

**Recommended Minimum Access Point:** Student can *access\** various *representative models\** of *waves\**

***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.

***waves\**** - In scientific terms, waves are an energy distribution mechanism. Waves transfer energy through a variety of matter. The broadest range of possible options for representing waves and energy transfer by waves through matter should be considered.

#### Modified Standards

##### HS-PS4-1

Differentiate wave frequency, wave length, and the speed of waves; and show their effect on various media

##### HS-PS4-2

Describe the functional advantages of storing and transmitting data digitally

##### HS-PS4-5

Identify technological devices that transmit and capture information or energy through waves

The modified standards included in this document can inform the content for a Physical, Earth, and Environmental Science high school course for students with significant cognitive disabilities. For the creation of an Environmental Science course, it is recommended that schools combine the Earth Science Human Sustainability Standards delineated in red above with the following Life Science Connectors Standards:

**Science Topic: Interdependent Relationship in Ecosystems**

**Science NVACS Connectors:**

<b>HS-LS2-1</b>
Describe the role resource availability plays on carrying capacity (population an ecosystem can support)

<b>HS-LS2-2</b>
Describe how changes in an ecosystem may affect biodiversity and characteristics of populations

<b>HS-LS2-6</b>
Examine biodiversity and the relationships among ecosystems

<b>HS-LS2-7</b>
Explain how human activity may affect the environment and biodiversity

<b>HS-LS2-8</b>
Explain how group behavior can increase the chances for an individual and a species to survive and reproduce

<b>HS-LS4-6</b>
Use a simulation or model to describe the effectiveness of human solutions related to the loss of biodiversity

A minimum of two science credits are required for students to attain the Alternative Diploma (Figure 1). This guidance document will assist schools and teachers in developing content for science courses other than a Life Sciences course. Delivery of the content required to meet science credit requirements 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 <sup>st</sup> Period	ELA I (1 Credit)	ELA II (1 Credit)	ELA III (1 Credit)	ELA IV (1 Credit)
2 <sup>nd</sup> Period	Algebra I (1 Credit)	Geometry (1 Credit)	Mathematics for Everyday Living (1 Credit)	
3 <sup>rd</sup> Period	Biology (1 Credit)	Physical, Earth, or Environmental Science (1 Credit)	Elective Credit (1 Credit)	
4 <sup>th</sup> Period	Economics (.5 Credit) American Government (.5 Credit)	American History (1 Credit)	Elective Credit (1 Credit)	
5 <sup>th</sup> Period	Health Education (.5 Credit)	Physical Education (1 Credit)	Physical Education (1 Credit)	
	Computer Science and Applications (.5 Credit)			
6 <sup>th</sup> Period	Culinary I (1 Credit)	Culinary II (1 Credit) *Flex Credit	Culinary III (1 Credit) * Flex Credit	
7 <sup>th</sup> Period	Elective Credit (1 Credit)	Elective Credit (1 Credit)	Elective Credit (1 Credit)	Elective Credit (1 Credit)