Investigations in Environmental Science Correlation to the Nevada Academic Content Standards for Earth and Space Science, Grades 9-12

Scientific Inquiry (Nature of Science Unifying Concept A)
Scientific inquiry is the process by which humans systematically examine the natural world. Scientific inquiry is a human endeavor and involves observation, reasoning, insight, energy, skill, and creativity. Scientific inquiry is used to formulate and test explanations of nature through observation, experiments, and theoretical or mathematical models. Scientific explanations and evidence are constantly reviewed and examined by others. Questioning, response to criticism and open communication are integral to the process of science.

Indicator	**Location/Page where Standard is found**
<u>N.12.A:</u> Students understand that a variety of communication methods can be used to share scientific information.	
N.12.A.1 Students know tables, charts, illustrations and graphs can be used in making arguments and claims in oral and written presentations. E/S	U1 SE: 6, 20-32, 34-35, 37, 39-42, 43-45, 46-47, 68-69, 71-74, 75-76-128-134, 128-134, 138-140, 145, 146-150, 158-160, 162-162, 170-171, 182-207 U2 SE: 12-14, 21-28,57-58, 66, 79-81, 100-104, 136-137, 146-147, 154-180, 196-201, 207-209, 211- 215, 216-217, 230-234, 240-241, 246, 254-294 U3 SE: 16-17, 19, 26, 28-30, 86-87, 103-104, 108-111, 118-119, 120-124, 136-140, 146-153, 155-158, 159-161, 162-163,170, 173-175,176-177, 188-189, 207-208, 225, 226-228, 231-232, 233, 238, 251-252, 253-254, 258-259, 267-

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N.12.A.2 Students know scientists maintain a permanent record of procedures, data, analyses, decisions, and understandings of scientific investigations. I/S	
N.12.A.3 Students know repeated experimentation allows for statistical analysis and unbiased conclusions. E/S	
N.12.A.4 Students know how to safely conduct an original scientific investigation using the appropriate tools and technology. E/L	U1 SE: 21-32, 81-92, 98-105, 12-13 U2 SE: 50-55, 57-58, 63-79, 90-92, 100-104, 119-120, 153-180, 207-209, 211-217, 230-234, 246, 254-294 U3 SE: 20-21, 22-24, 28-30, 36-37, 39-40, 41-42, 44-45, 52-54, 72-73, 74-77, 81-82, 89-91, 92-94, 95-96, 98, 105-107, 118-119, 120-121, 122-123, 128-130, 136-137, 138-140, 145-147. 164-165, 170-172, 181-182, 188-189, 192, 199-202, 207-208, 217-219, 222-223, 274-279
N.12.A.5 Students know models and modeling can be used to identify and predict cause-effect relationships. I/S	U2 SE: 57-58, 63-69, 79-81, 85-86, 100-104, 211-215, 230-234, 240-241 U3 SE: 81-83, 88-91, 92-94, 95-96, 98, 105-107. 118-119, 120-121, 122-123, 128-130, 145-147, 170-172, 192, 199-208, 222-223, 224
N.12.A.6 Students know organizational schema can be used to represent and describe relationships of sets. E/S	U1 SE: 20- 32, 38-42, 81-92, 98-105, 158-162, 170- 171 U2 SE: 21-29, 51-52, 57-58, 61, 62, 64-69, 100-104, 120, 121, 136, 142, 154-173, 207-217, 230-234, 240-241, 246, 262, 270-287 U3 SE:

	11-12, 19, 26, 34, 44, 46, 81-82, 83, 87, 89-91, 92-94, 95-96, 104, 105-107, 118-119, 120-121, 122-123, 136-137, 138-140, 146, 148-153, 156, 170, 174-175, 177, 181-182, 188-189, 199, 207, 218, 227, 233, 239, 263, 274-279

Science, Technology, and Society (Nature of Science Unifying Concept B)

Technology defines a society or era. It can shape the environment in which people live, and it has increasingly become a larger part of people's lives. While many of technology's effects on society are regarded as desirable, other effects are seen as less desirable. These concepts are shared across subject areas such as science, math, technology, social studies and language arts. The development and use of technology affects society and the environment in which we live, and, at the same time, society influences the development of technology and its impact on culture.

Indicator	**Location/Page where Standard is found**
<u>N.12.B:</u> Students understand the impacts of science and technology in terms of costs and benefits to society.	
N.12.B.1 Students know science, technology, and society influenced one another in both positive and negative ways. E/S	U1 SE: 3-7, 34-35, 36-37, 38-42, 49-51, 53-61, 68-70, 71-74, 77-78, 93-94, 98-99, 106-109, 110-119, 120-134, 138-140, 155-157, 161, 162, 176-180, 182-207 U2 SE: 4-14, 43-46, 63-69, 74-77, 82-84, 85-86, 90-92, 113-117, 121-126, 127-129, 133-137, 146-151, 154-180, 186-189, 202-203, 218-220, 226-229, 242-245, 254-294 U3 SE: 5-12, 48-50, 65-66, 98, 108-111, 105-107, 113-115, 116-117, 118-119, 120-121, 122-124, 131-134, 136-140, 159-161, 176-177, 179-180, 181-182, 262-264, 194-195, 196-198, 199-202, 203-204, 206-208, 230, 231-232, 266-299

N.12.B.2 Students know consumption patterns, conservation efforts, and cultural or social practices in countries have varying environmental impacts. E/S	U1 SE: 2-7, 66-74, 77-78, 93-94, 106-109, 110-119, 120-127, 182-207 U2 SE: 4-11, 79-81, 82-84, 85-86, 148-151, 184-185, 242-245, 247-251, 266-269 U3 SE: 5-12, 49-50, 65-66, 67-70, 85-96, 99, 141-143, 166-168, 212-213, 214-216, 217, 218-219, 233-235, 237-239, 245-246, 251-252, 253-254, 255-257, 258-259, 266- 299
N.12.B.3 Students know the influence of ethics on scientific enterprise. E/S	U1 SE: 53-61, 120-134, 182-207 U2 SE: 12-14, 153-180, 253-294 U3 SE: 5-12, 102, 105-107, 113-115, 116-117, 178-183, 205-209, 266-299
N.12.B.4 Students know scientific knowledge builds on previous information. E/S	U1 SE: 182-207 U2 SE: 153-180, 253-294, 186-189, 190-194 U3 SE: 205-209, 112-124, 266-299

EARTH SCIENCE

Atmospheric Processes and the Water Cycle (Earth and Space Science Unifying Concept A)
Earth systems have internal and external sources of energy, both of which create heat. Driven by sunlight and Earth's internal heat, a variety of cycles connect and continually circulate energy and material through the components of the earth systems.

Indicator	**Location/Page where Standard is found**

E.12.A: Students understand heat and energy transfer in and out of the atmosphere and influence weather and climate.	
E.12.A.1 Students know the Sun is the major source of Earth's energy, and provides the energy driving Earth's weather and climate. E/S	U1 SE: 81-92, 98-105 U2 SE: 184-185, 195-201, 202-203, 204-209, 211-217, 226-229, 230-234
E.12.A.2 Students know the composition of Earth's atmosphere has changed in the past and is changing today. I/S	U2 SE: 141-143, 182-183, 184-185, 186-189, 190-194, 195-201, 202-203, 218-219, 222-225, 230-234, 235-236, 237-239, 240-241
E.12.A.3 Students understand the role of the atmosphere in Earth's greenhouse effect. E/S	U2 SE: 184-185, 186-189, 196-201, 202-203, 210-215, 216-217, 222-225, 226-229, 230-234, 238-239, 248-251
E.12.A.4 Students know convection and radiation play important roles in moving heat energy in the Earth system. E/S	U2 SE: 184-185, 186-189, 205-206, 207-209, 211-215, 216-217, 218-220
E.12.A.5 Students know Earth's rotation affects winds and ocean currents. I/S	U2 SE: 146-147, 218-220, 230

Solar System and Universe (Earth and Space Science Unifying Concept B)

The universe is a dynamic system of matter and energy. The universe is extremely large and massive with its components separated by vast distances. Tools of technology will continue to aid in the investigation of the components, origins, processes and age of the universe. Earth is one part in our solar system, which is within the Milky Way galaxy. The Sun is the energy-producing star for our solar system. Most objects in our solar system are in predictable motion, resulting in phenomena such as day/night, year, phases of the moon, tides, and eclipses.

Indicator	**Location/Page where Standard is found**
E.12.B: Students know scientific theories of origins and evolution of the universe.	
E.12.B.1 Students know common characteristics of stars. I/S	
E.12.B.2 Students know stars are powered by nuclear fusion of lighter elements into heavier elements, which results in the release of large amounts of energy. I/S	

E.12.B.3 Students know ways in which technology has increased understanding of the universe. I/S	
E.12.B.4 Students know the on-going processes involved in star formation and destruction. W/L	
E.12.B.5 Students know scientific evidence suggest that the universe is expanding. I/S	
E.8.B.7 Students know regular and predictable motions of Earth around the Sun and the Moon around the Earth explain such phenomena as the day, the year, phases of the Moon, and eclipses. E/S	

Earth's Composition and Structure (Earth and Space Science Unifying Concept C)

Earth is composed of materials that move through the biogeochemical cycles. Earth's features are shaped by ongoing and dynamic processes. These processes can be constructive or destructive and occur over geologic time scales.

Indicator	**Location/Page where Standard is found**
<u>E.12.C:</u> Students understand evidence for processes that take place on a geologic time scale.	
E.12.C.1 Students know how successive rock strata and fossils can be used to confirm the age, history, and changing life forms of the Earth, including how this evidence is affected by the folding, breaking, and uplifting of layers. E/S	U2 SE: 235
E.12.C.2 Students understand the concept of plate tectonics including the evidence that supports it (structural, geophysical and paleontological evidence). E/S	
E.12.C.3 Students know elements exist in fixed amounts and move through solid earth, oceans, atmosphere and living things as part of biogeochemical cycles. E/S	U1 SE: 95-97, 106-109 U2 SE: 23-27, 28-29, 40-42, 95-99, 218-220, 240-241, 242-244, U3 SE: 34-35, 81-82, 83, 170-172
E.12.C.4 Student know processes of obtaining, using, and recycling of renewable and non-renewable resources. E/S	U1 SE: 93-94, 106-109, 121-127 U2 SE: 43-46, 47-49, 64-66, 67-69, 70, 71-72, 73-77, 79-81, 85-86, 95-99, 100-103 U3 SE:

	36-39, 211-219
E.12.C.5 Students know soil, derived from weathered rocks and decomposed organic material, is found in layers. E/S	U3 SE: 16-17, 18-19, 20-21, 22-24, 25-26, 27, 28-30, 31-33, 36-37, 164-165, 166-167

Investigations in Environmental Science also address the following standards:

P12.A6 – Students know chemical reactions either release or absorb energy – Unit 2

P12.C1 – Students know waves (i.e. sound, seismic, electromagnetic) have energy that can be transferred when the waves interact with matter. – Unit 2

P12.C2 – Students know energy forms can be converted. – Unit 2

P12.C3- Students know nuclear reactions convert a relatively small amount of material into a large amount of energy. – Unit 2

P12.C6 – Students know electricity is transferred from generating sources for consumption and practical uses. – Unit 2

Biology Standards:
Students understand that ecosystems display patterns of organization, change and stability as a result of the interactions and interdependencies among the living and non-living components of the Earth. – Unit 1

Students know relationships of organisms and their physical environment. – Unit 1

Students know how changes in an ecosystem can affect biodiversity and biodiversity's contribution to an ecosystem's stability. – Unit 1

Students know that amount of living matter an environment can support is limited by the availability of matter, energy, and the ability of the ecosystem to recycle materials. – Unit 1