

Analysis of NM STEM Ready Standards vs. NGSS

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Announcement of rule change on NM PED website and proposed standards available on PED website:
<http://ped.state.nm.us/ped/PublicNotices.html>

Elementary School

89 NGSS standards

1 revised standard

17 NM flavor standards

107 total standards

89/107=83% NGSS

If NM flavor is not considered 89/90=99% NGSS

Middle School

66 NGSS standards

5 revised

10 NM flavor standards

81 total standards 66/81=81% NGSS

If NM flavor is not considered 66/71=93% NGSS

High School

56 NGSS standards

4 revised standards (including 1 omitted standard)

8 NM flavor standards

68 total standards 56/68=82% NGSS

If NM flavor is not considered 56/59=93% NGSS

Key:

Underlined = new language

~~Strike through~~ = omitted

Kindergarten (1 additional standard)

K-LS-1 NM-1: Use observations of New Mexico plants and animals to describe patterns, that animals, need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirements of plants to have light; and, that all living things need water.

Grade 1 (3 additional standards)

1-ESS1-2 NM: Make observations at different times of year to relate the amount of daylight to the time of year emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring (e.g., snow melting, spring break, flowers) or fall (e.g., fall colors, starting school, state fair, balloon fiesta).

(4) New Mexico science and society:

1-NMSS-1: Read texts to discover that men and women of all ethnic and social backgrounds practice science and technology.

1-NMSS-2: Use media to discover that men and women of all ethnic and social backgrounds practice science and technology.

Grade 2 (5 additional standards; 1 typo)

2-ESS1-1 NM: Use information from several sources to provide evidence that Earth events can occur quickly or slowly. Although there are no active volcanoes in New Mexico, many extinct volcanoes exist throughout the state.

2-ESS2-2 NM: Develop a model to represent the state of New Mexico and the Rio Grande river and related water systems.

2-ESS2-3 NM: Obtain information to identify where fresh water is found on Earth, including the Rio Grande river and mountains.

(4) New Mexico science and society:

2-NMSS-1 Understand that everybody can do science, invent things, and formulate ideas.

2-NMSS-2 Use information from several sources to know that science has discovered many things about objects, events, and nature and there are many more questions to be answered.

(5) Engineering and design

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 (2 additional standards)

3-LS4-1 NM: Analyze and interpret data from fossils to provide evidence of the organisms and the environments include the state fossil Coelophysis, a theropod dinosaur.

3-LS3-2 NM: Obtain information on plants and animals in New Mexico and their ecosystem to use as evidence to support the explanation that traits can be influenced by the environment.

Grade 4 (1 revised standard; 3 additional standards)

1. 4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from ~~natural~~ renewable and non-renewable resources and how their uses affect the environment.

4-ESS3-1 NM: Obtain and combine information to describe the energy sources in the school's community and New Mexico and how it benefits the community.

4-ESS1-1 NM: Identify evidence from patterns in rock formation and fossils in rock layers to support possible explanations of New Mexico's geological changes over time.

4-ESS3-2 NM: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on New Mexico's people and places.

Grade 5 (3 additional standards)

5-ESS2-1 NM: Develop a model using an example to describe the way the geosphere, biosphere, hydrosphere, and/or atmosphere interact in New Mexico.

5-ESS2-1 NM: Obtain and combine information about ways your school communities use science ideas to protect the Earth's resources and environment.

(5) New Mexico science and society

5-NMSS-1: Use information to discover STEM careers throughout the state and know that both men and women of all races and social backgrounds have these careers.

Grades 6-8 (1 omitted standard; 3 revised standards; 8 new standards)

MS-LS2-1 NM: Analyze and interpret data to provide evidence for how organisms and populations (i.e. big horn Sheep, black bears, cougars, elk, deer, fish, coyote, wolves) exist together to create an ecosystem.

MS-LS2-4 NM: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem in New Mexico (forest, grasslands, desert, bosque) affect populations.

MS-LS2-5 NM: Evaluate competing design solutions for maintaining biodiversity and ecosystem services in New Mexico (i.e. soil erosion protection, forest fire control, watershed planning, recycling, water purification and conservations).

~~MS-LS4-3 Analyze displays of pictorial data to compare patterns of similarities in embryological development across multiple species to identify relationships not evident in the full formed anatomy.~~

2. MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's ~~4.6 billion year old~~ geologic history.

MS-ESS2-1 NM: Obtain and combine information to describe the impact of volcanoes and faults on New Mexico geology.

MS-ESS3-1 NM: Gather and synthesize information on what geologic processes/formations account for the concentration of oil and gas in certain regions of New Mexico.

MS-ESS2-5 NM: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions in New Mexico due to regional geography.

3. MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused ~~the rise~~ fluctuations in global temperatures over the past century.

MS-ESS3-5 NM: Ask questions to clarify evidence of the factors that have caused the fluctuation in global temperatures, and consider the risks and benefits associated with technologies related to energy production.

4. MS-ESS3-3: Apply scientific principles to design a method for monitoring, evaluating, and managing a human impact on the environment.

MS-ESS3-3 NM: Describe the benefits associated with technologies related to the location industries and energy production.

High School (5 revised standards; 10 new standards)

HS-PS-8 NM: Describe NM's role in nuclear science (Manhattan Project, WIPP, National Laboratories).

HS-PS-8a NM: Explore and communicate a 21st Century innovation created by the National Laboratories in New Mexico that demonstrates how advances in technology enable further advances in science.

HS-LS2-7 NM: Using a local issue, in your solution design, include the benefits of human activities that support the local population including reclamation projects, building dams and habitat restoration.

HS-LS4-6 NM: Identify a problem within the school community and create or revise a simulation to test a solution to reduce impacts on biodiversity.

5. HS-LS4-1: Analyze, interpret, and communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

6. HS-LS4-2: Construct an explanation based on evidence that ~~the process of evolution primarily results from four factors:~~ biological diversity is influenced by (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

7. HS-ESS2-7: Construct an argument based on evidence about the ~~simultaneous co-~~evolution of Earth's systems and life on Earth.

HS-ESS2-4 NM: Use a model to describe how variations in the flow of energy into and out of Earth's systems that were caused by natural occurrences that are not related to human activity.

8. HS-ESS3-5: Analyze ~~geoscience~~ data and the results from global climate models to make an evidence-based forecast of the current rate of global or ~~regional climate change~~ climate fluctuation and associated future impacts to Earth's systems.

HS-ESS3-2 NM: Describe how scientific knowledge helps decision makers with New Mexico national and global challenges (e.g., waste isolation pilot project [WIPP], mining, oil and gas production, and population growth).

HS-ESS3-4 NM: Evaluate the influences of technology on society (e.g., communications, petroleum, transportation, nuclear energy) including desired and undesired effects, and including some historical examples (e.g., telegraph, printing press, model-t ford, discovery of electricity, manhattan project).

9. HS-ESS3-6: Use a computational representation to illustrate the relationships among Earth's systems and how those relationships are being modified ~~due to human activity.~~

HS-ESS3-6 NM: Explain how societies can change ecosystems and how these changes can be reversible or irreversible.

New Mexico science and society:

HS-NMSS-1: Identify important questions that science cannot answer (e.g., questions beyond today's science, decisions that science can only help make, and questions that are inherently outside the realm of science).

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HS-NMSS-2: Identify ways that science plays a role in many different kinds of careers and activities (e.g., public service, legislators, teachers, farmers, ranchers, construction workers, ranchers, oil and gas workers, miners, movie industry support, landscapers, ski resort snowmakers).