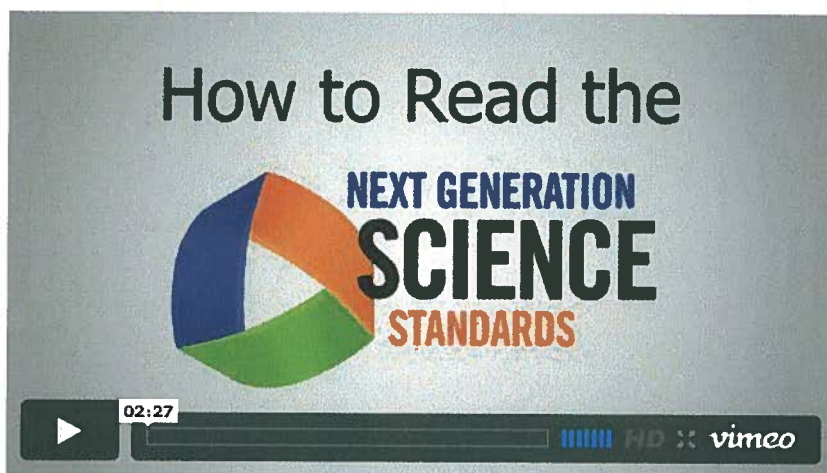




How to Read the Next Generation Science Standards

The Next Generation Science Standards (NGSS) are distinct from prior science standards in that they integrate three dimensions within each standard and have intentional connections across standards. To provide guidance and clarification to all users of the standards, the writers have created a system architecture that highlights the NGSS as well as each of the three integral dimensions and connections to other grade bands and subjects. The standards are organized in a table with three main sections: 1) performance expectation(s), 2) the foundation boxes, and 3) the connection boxes.

In the figure below, from top to bottom are seen the title, the topic label row, the performance expectation(s) (the assessable component), the foundation boxes (containing Practices, Disciplinary Core Ideas and Crosscutting Concepts), and the connection boxes. Detailed information about this architecture can be found online [here](#).



Related Content

[Detailed Information on How to Read the Standards](#) (PDF)

What's New?

The First Public Draft is Ready for Review!

[Click here to read and provide comments on the first of two public drafts of the NGSS](#)

Code for Topic Name

System Architecture

Assessable Component

MS.ESS-SS Space Systems

Students who demonstrate understanding can:

- Construct explanations for the occurrences of day/night cycles, seasons, tides, eclipses, and lunar phases based on patterns of the observed motions of celestial bodies.** (Assessment Boundary: *Kepler's Laws of orbital motion are not used as the basis for evidence at this level.*)
- Obtain, evaluate, and communicate support the Big Bang theory.** (Clarification: *radiation, the motions of galaxies away from each other.*)
- Construct and use models to describe the solar system, Milky Way Galaxy, and universe.** (Assessment Boundary: *Mathematical models are not expected; use AU for Solar System scale; use light years for universal scale.*)
- Use models to support explanations of the composition, structure, and formation of the solar system from a disk of dust and gas drawn together by gravity.**

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices

Developing and Using Models
Modeling in 6-8 builds on K-5 and progresses to developing, using and revising models to explain, explore, and predict more abstract phenomena and design systems.
• Use and/or construct models to predict, explain, and/or collect data to test ideas about phenomena in natural or designed systems, including those representing inputs and outputs. (c),(d)

Constructing Explanations and Designing Solutions
Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence, principles, and theories.
• Base assumptions as the so in
Obtaining Information
Obtaining, evaluating, and communicating information in 6-8 builds on 3-5 and progresses to evaluate the merit and validity of ideas and methods.
• Read critically using scientific knowledge and reasoning to evaluate data, hypotheses, conclusions, and competing information. (b)

Disciplinary Core Ideas

ESS1.A: The Universe and Its Stars
• Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (a)
• The universe began with a period of extreme and rapid expansion known as the Big Bang. Nearly all observable matter in the universe is hydrogen or helium, which formed in the first minutes after the Big Bang. (b)
• Earth and the solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (c)

ESS1.B: Earth and the Solar System
• The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids. Gravity has kept the planets in orbit around the sun by its gravitational pull. (a)
• This model of the solar system shows the planets, moons, and asteroids in their orbits around the sun. (a)
• Earth's spin on its axis causes day and night. (a)
• Earth's tilt on its axis causes the seasons. (a)
• Earth's orbit around the sun causes the year. (a)
• The differential intensity of sunlight on different areas of Earth over the year is a result of that tilt, as are the seasons that result. (a)
• A system can be changing but have a stable repeating cycle of changes; such observed regular patterns allow predictions about the system's future (e.g., Earth orbiting the sun). (a)

PS2.C: Stability and Instability in Physical Systems
• A system can be changing but have a stable repeating cycle of changes; such observed regular patterns allow predictions about the system's future (e.g., Earth orbiting the sun). (a)

Crosscutting Concepts

Patterns
Macroscopic patterns are related to the nature of microscopic and atomic-level structure. Patterns in rates of change and other numerical relationships can provide information about natural and human designed systems. Patterns can be used to identify cause and effect relationships. Graphs and charts can be used to identify patterns in data. (a),(d)

Scale, Proportion, and Quantity
Time, space, and energy phenomena can be observed at various scales using models to study systems that are too small or too large to observe directly. Properties and processes can be compared across scales. Properties and processes can be compared across scales. Properties and processes can be compared across scales. (a),(d)

Lowercase letters designate which of the performance expectations incorporate this disciplinary core idea

Lowercase letters designate which of the performance expectations incorporate this crosscutting concept

Connections Boxes

Connections to other DCIs in this grade-level: MS.LS-GDRO, MS.PS-FM, MS.PS-IF, MS.PS-E

Articulation to DCIs across grade-levels: 1.PCS, 5.ESS, MS.ESS-SS

Common Core State Standards Connections: (Note: these connections will be made more explicit and complete in future draft releases.)

ELA

W.6.1 Write arguments to support claims with clear reasons and relevant evidence.
W.6.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
W.7.1 Write arguments to support claims with clear reasons and relevant evidence.
W.7.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

W.8.1 Write arguments to support claims with clear reasons and relevant evidence.
W.8.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

Mathematics

MP.4 Model with mathematics
8.F Use functions to model relationships between quantities

Read the NGSS

Go to the NGSS survey

Attachments:

 How to Read Next NGSSFINAL PUBLIC May Draft.pdf

© 2011, 2012, Achieve, Inc. All rights reserved.
NEXT GENERATION SCIENCE STANDARDS and the associated logo are trademarks of Achieve, Inc.