

The logo for Science Anchors features the word "SCIENCE" in blue, uppercase letters. Below it, the word "Anchors" is written in a gold, lowercase font. A stylized anchor graphic, composed of blue and gold geometric shapes, is positioned between the two words. A horizontal gold line runs across the middle of the anchor graphic.

SCIENCE Anchors

A Vision for Clear, Coherent and Manageable Science Standards

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History

- 2007 NSTA Board Exploration
- 2008 Science Anchors National Taskforce
The Report Requested Revisions
- 2009 Work Began
Interagency Steering Committee
Conceptual Framework and Paper
Input from NSTA, CSSS
Writers & Developers

Vision

Exemplary science standards are:

- CLEAR targets for instruction and assessment
- COHERENT concepts within and across disciplines
- MANAGEABLE for teachers and students

Approach

- Identify a coherent set of Big Ideas
- Prioritize standards that support Big Ideas
- Eliminate nonessential content
- Update the science

Questions

- A. Audience
- B. Purpose
- C. Disciplinary content: Big Ideas
- D. Disciplinary content: Learning Progressions
- E. Crosscutting content
- F. Scope
- G. Organization
- H. How much is too much?

A. Audience

- State science education leaders
- State & district assessment teams
- Curriculum developers
- Teacher educators
- Teachers
- School board members
- Parents

All are equally important

B. Purpose

- 1996 All students scientifically literate
- 2009 All students able to:
 - § Succeed in college
 - § Thrive in the workforce
 - § Participate in civic life

C. Big Ideas

- Central to the disciplines
- Broad explanatory power
- Integrates many key concepts
- Understanding grows over the years



D. Big Ideas and Learning Progressions

- Describe actual learning trajectories
- Allow for stepping-stone concepts
- Can be corrected with further research

E. Crosscutting Content

- As important as disciplinary content
- May include concepts such as:
 - Nature of science
 - Process of inquiry (The practice of science)
 - Engineering design
 - Unifying principles
 - Habits of mind
 - Strands from TSTS

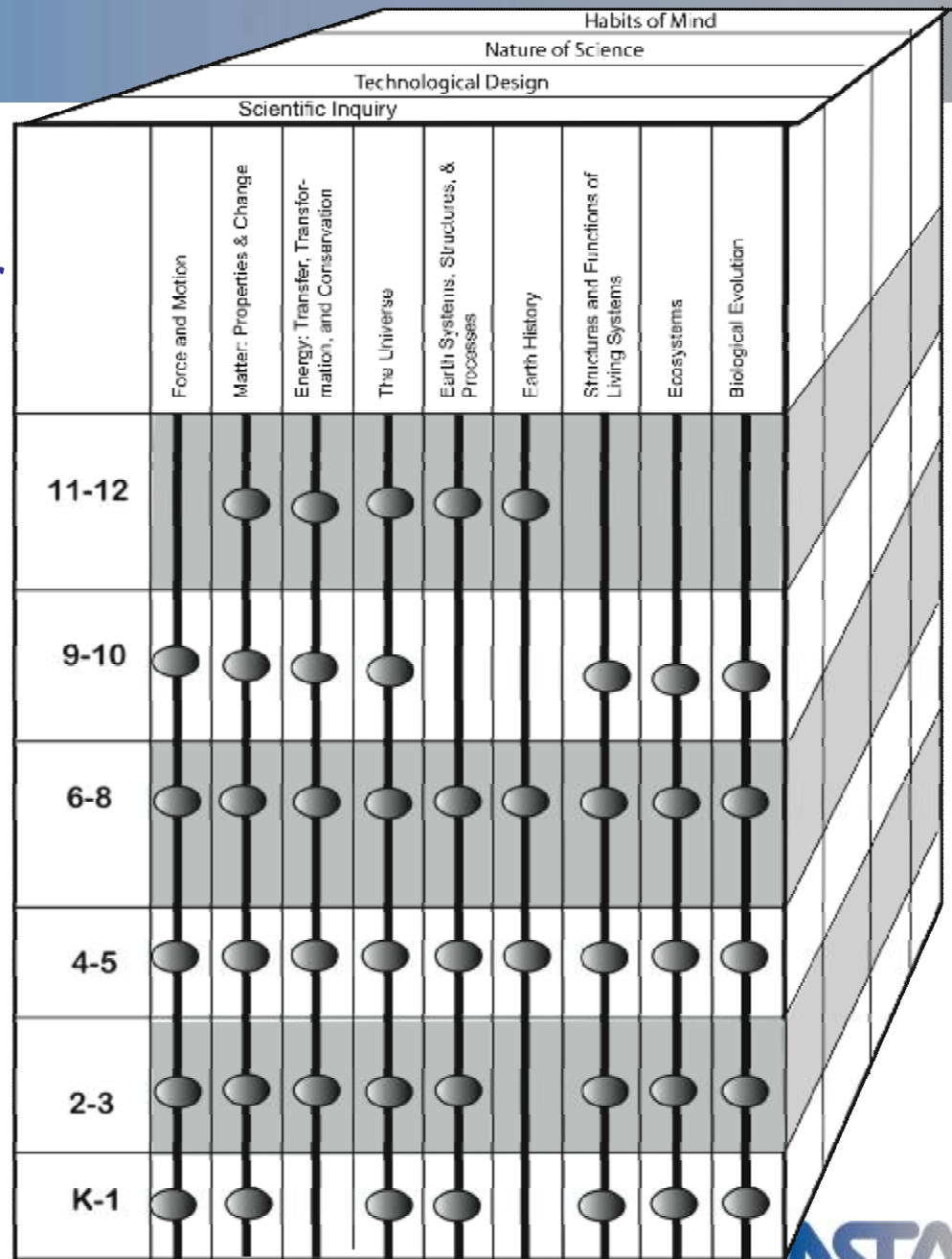
Science Anchors Graphic Organizer

§ 9 big ideas - vertical strings *(tentative)*

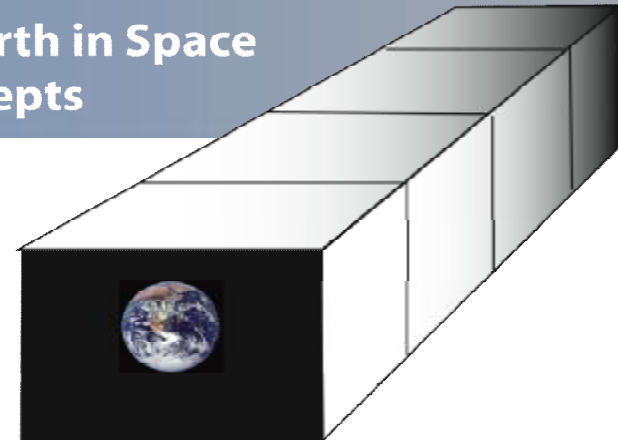
§ 6 grade groups *(tentative)*

§ Science units are beads

§ 4 crosscutting concepts and abilities *(tentative)*



Example: The Universe



11-12



9-10



6-8



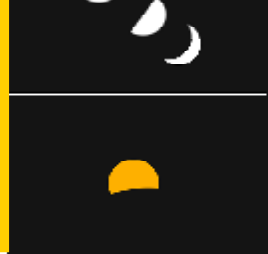
4-5



2-3



K-1



Earth is spherical in shape. It spins on its axis and orbits the Sun.

Earth's daily spin relative to the Sun causes night and day.

Earth's nearly circular yearly orbit around the Sun causes us to see different constellations at different times of year.

Earth is approximately spherical in shape. Things on or near the Earth are pulled toward Earth's center by the force of gravity.

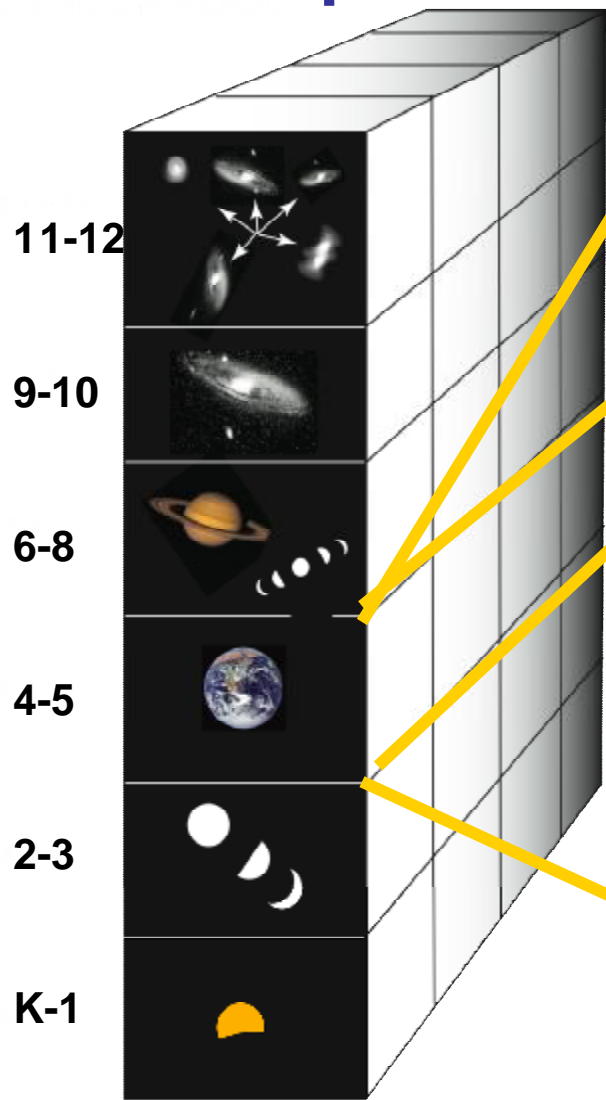
The Sun is a star. It is the central and largest body in our Solar System. The Sun appears much brighter and larger in the sky than other stars because it is many thousands of times closer to Earth.

Supporting Concepts and Benchmarks

Grades 4-5: Earth in Space

Crosscutting Concepts & Abilities

Example *Cont.*



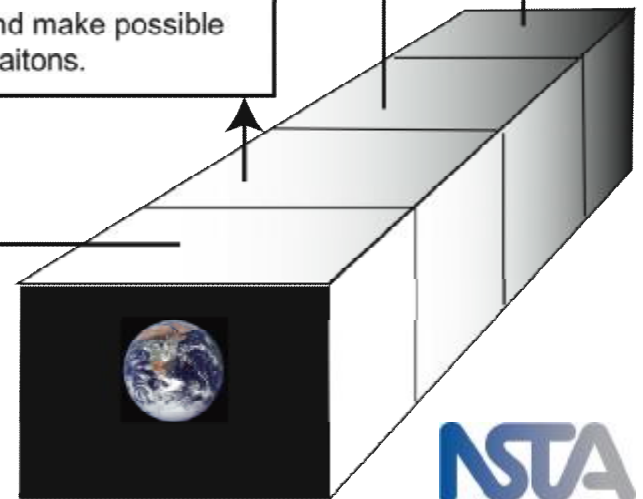
Essential Concept: Earth is spherical in shape. It spins on its axis and orbits the Sun.

Habits of Mind: Students are critical of the spherical Earth concept but open to weighing evidence for and against this idea.

Nature of Science: Students know that evidence convinced people that Earth is a sphere long before Columbus and Magellan.

Design: Envision how satellites are launched into orbit and make possible worldwide communications.

Inquiry: Using the spherical Earth concept to explain night & day.



F. Scope

Should science standards include:

- Teaching methods?
- 21st century skills?
- Engineering and technology?
- Performance expectations?

G. Organization

Should standards be organized:

- Grade-by-grade?
- Grade bands K-8
- Courses or topics 9-12?

H. How Much is too Much

- How to avoid “mile wide and inch deep?”
- Fewer standards are less specific.
- Fewer standards may not mean less content.
- What is the appropriate grain size?
- How do we make the hard choices?