



**NEXT GENERATION**

**SCIENCE**

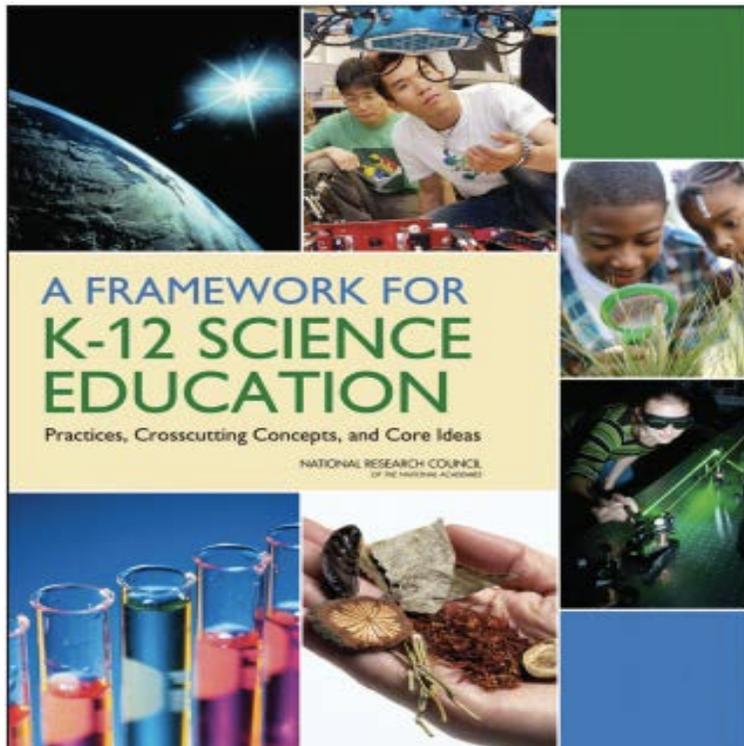
**STANDARDS**

**For States, By States**

# Developing the NGSS

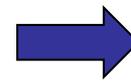


Phase I



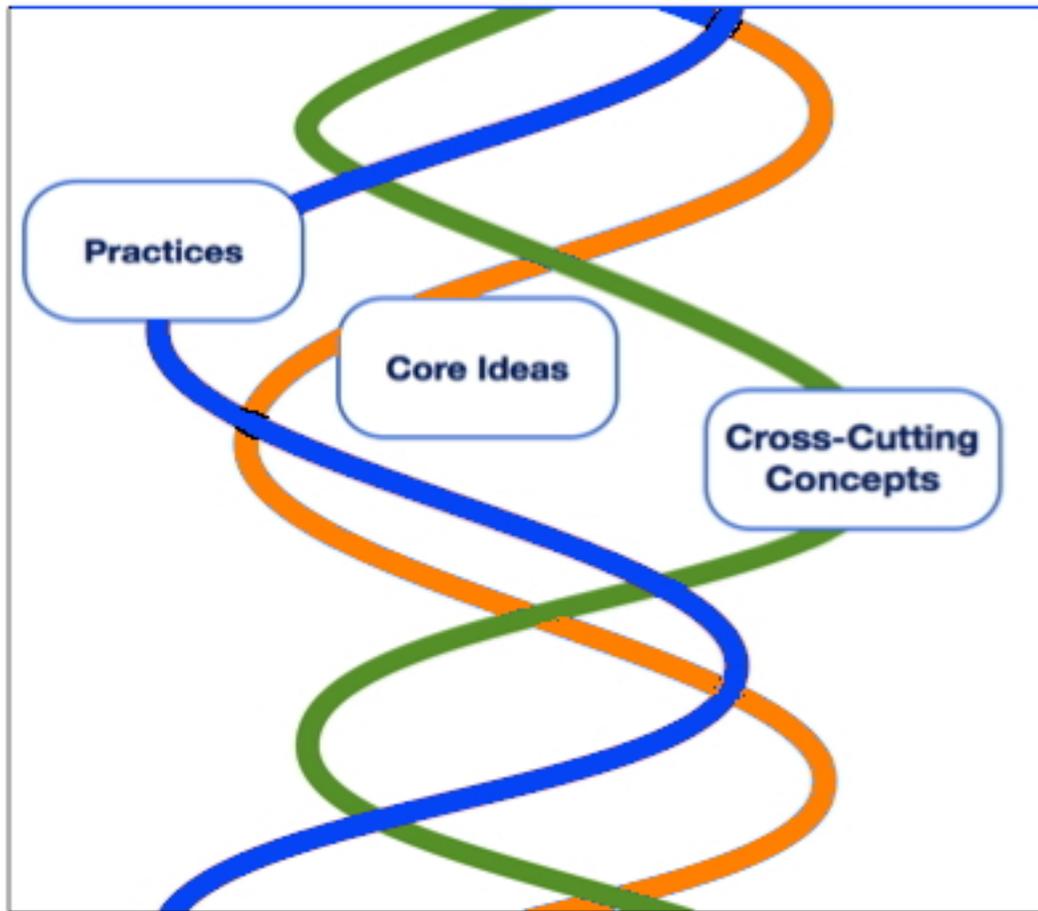
1/2010 - 7/2011

Phase II



7/2011 – April 2013

# Three Dimensions Intertwined



- The NGSS are written as Performance Expectations
- NGSS will require contextual application of the three dimensions by students.
- Focus is on how and why as well as what



# **What's Different about the Next Generation Science Standards?**

# Current State Science Standard Sample



## Inquiry Standards

- a. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.
- b. Students will use standard safety practices for all classroom laboratory and field investigations.
- c. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.
- d. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities utilizing safe laboratory procedures.
- e. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.
- f. Students will communicate scientific ideas and activities clearly.
- g. Students will question scientific claims and arguments effectively.

## Content Standards

- a. Distinguish between atoms and molecules.
- b. Describe the difference between pure substances (elements and compounds) and mixtures.
- c. Describe the movement of particles in solids, liquids, gases, and plasmas states.
- d. Distinguish between physical and chemical properties of matter as physical (i.e., density, melting point, boiling point) or chemical (i.e., reactivity, combustibility).
- e. Distinguish between changes in matter as physical (i.e., physical change) or chemical (development of a gas, formation of precipitate, and change in color).
- f. Recognize that there are more than 100 elements and some have similar properties as shown on the Periodic Table of Elements.
- g. Identify and demonstrate the Law of Conservation of Matter.

# Standards Comparison: Structure and Properties of Matter



## Current State Middle School Science Standard

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# Standards Comparison: Structure and Properties of Matter



## NGSS Middle School Sample

Students who demonstrate understanding can:

1. Develop models to describe the atomic composition of simple molecules and extended structures.
2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.\*

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6. **Undertake a design project to construct, test, and modify a device** that either releases or absorbs thermal energy by chemical processes.\*

# Shifts in the NGSS



1. Evidence of learning
2. Learning Progressions
3. Science and Engineering
4. Coherence of Science Instruction
5. Connections within Science and between mathematics and literacy

# Contact Information



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