Introduction to the Oklahoma Science Framework Project

Tiffany Neill, Director of Science Education
Office of Instruction
Oklahoma State Department of Education
Tiffany.Neill@sde.ok.gov
(405) 522-3524

5TH GRADE

5-PS1-1 Matter and Its Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Develop a model to describe phenomena.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Structure and Properties of Matter:** • Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. • A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects.	**5-PS1-1** *Students who demonstrate understanding can:* **Develop a model to describe that matter is made of particles too small to be seen.** **Clarification Statement:** Examples of evidence that could be utilized in building models include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water. **Assessment Boundary:** Assessment does not include atomic-scale mechanism of evaporation and condensation or defining the unseen particles.

Crosscutting Concepts: Scale, Proportion, and Quantity
• Natural objects exist from the very small to the immensely large.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

What students are expected to do to demonstrate their understanding of science concepts and ability to explain them or make application of them.

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Dimension 1: Science and Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Dimension 2: Crosscutting Concepts

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function
7. Stability and change

Dimension 3: Disciplinary Core Ideas

Physical Science
PS1: Matter and Its Interactions
PS2: Motion and Stability: Forces and Interactions
PS3: Energy
PS4: Waves and Their Applications in Technologies for Information Transfer

Life Science
LS1: From Molecules to Organisms: Structures and Processes
LS2: Ecosystems: Interactions, Energy, and Dynamics
LS3: Heredity: Inheritance and Variation of Traits
LS4: Biological Unity and Diversity

Earth and Space Sciences
ESS1: Earth's Place in the Universe
ESS2: Earth's Systems
ESS3: Earth and Human Activity

Oklahoma Science Framework Project

Using the Science Framework Project Resources for Classroom Instruction

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Behavior of Energy

7th Grade Physics Unit

Phenomenon Ideas

Behavior of Energy Key Concepts

- *Energy is conserved*
- *Energy can be transferred between objects and states*

Commons Student Misconceptions

- *Energy does not need to be conserved*
- *Energy is a relatively short lived product that is generated, active and then disappears or fades.*

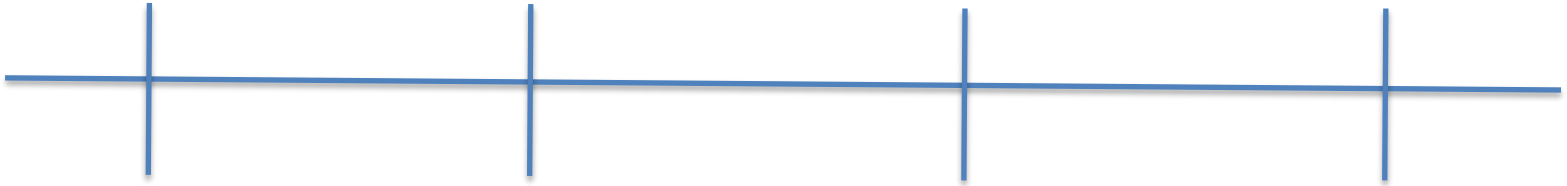
The phenomenon in the classroom

Experiencing a tennis ball rebound higher than the height it was dropped from when dropped with a basketball provides evidence that energy can be transferred from one object to another. This evidence helps students build an understanding about the behavior of energy.

Phenomenon

A tennis ball rebounds higher than the height from which it was dropped when dropped with a basketball.

Implementation Timeline



Summer 2014
OAS-Science
Adopted

2014-2015
Assessments
aligned to
PASS

2015-2016
Assessments
aligned to
PASS

2016-2017
Assessments
aligned to the **new**
OAS-Science

Questions