

Next Generation Science Standards (NGSS)

# What are the Next Generation Science Standards (NGSS)?

- **Goal to prepare today's students for tomorrow's workforce**
- **Standards that are rich in content and arranged in a coherent manner across disciplines and grades to provide all students an internationally-benchmarked science education**
- **Based on the *Framework K-12 Science Education* developed by the National Research Council**

# The 3 Dimensions of NGSS

## Dimension 1: Practices

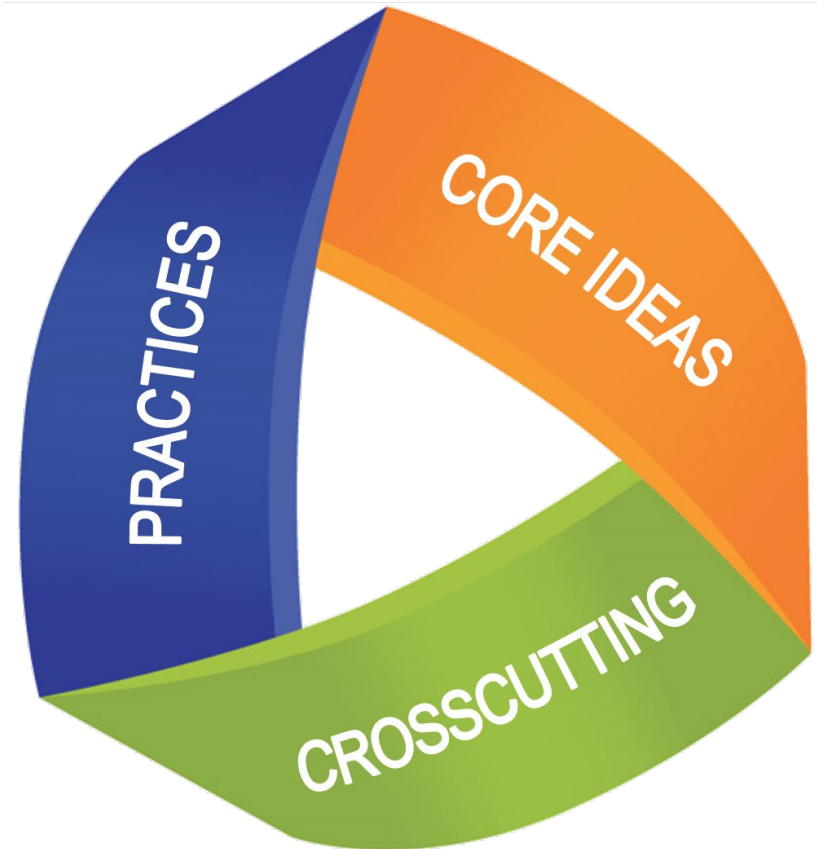
- Behaviors that scientists engage in on a regular basis

## Dimension 2: Crosscutting Concepts

- Applications that cross all domains of science

## Dimension 3: Disciplinary Core Ideas

- Physical, Life, Earth and Space, Engineering/Technology and Applications of Science



## 4-LS1 From Molecules to Organisms: Structures and Processes

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Students who demonstrate understanding can:

- 4-LS1-1.** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]
- 4-LS1-2.** Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. [Clarification Statement: Emphasis is on systems of information transfer.] [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.]

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 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

- Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2)

#### Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- Construct an argument with evidence, data, and/or a model. (4-LS1-1)

### Disciplinary Core Ideas

#### LS1.A: Structure and Function

- Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

#### LS1.D: Information Processing

- Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)

### Crosscutting Concepts

#### Systems and System Models

- A system can be described in terms of its components and their interactions. (4-LS1-1),(4-LS1-2)

Connections to other DCIs in fourth grade: *N/A*

Articulation of DCIs across grade-levels:

**1.LS1.A** (4-LS1-1); **1.LS1.D** (4-LS1-1); **3.LS3.B** (4-LS1-1); **MS.LS1.A** (4-LS1-1),(4-LS1-2); **MS.LS1.D** (4-LS1-2)

Common Core State Standards Connections:

*ELA/Literacy* -

**W.4.1** Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (4-LS1-1)

**SL.4.5** Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-LS1-2)

*Mathematics* -

**4.G.A.3** Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded across the line into matching parts.

# State of Illinois Timeline

- February 2014- State of Illinois adopts NGSS to replace Illinois State Science Standards
- Full implementation 2016-2017 school year
- NGSS aligned science assessment
  - 5th, 8th, and HS Biology
  - Spring 2016 (late April through May)
  - Online only



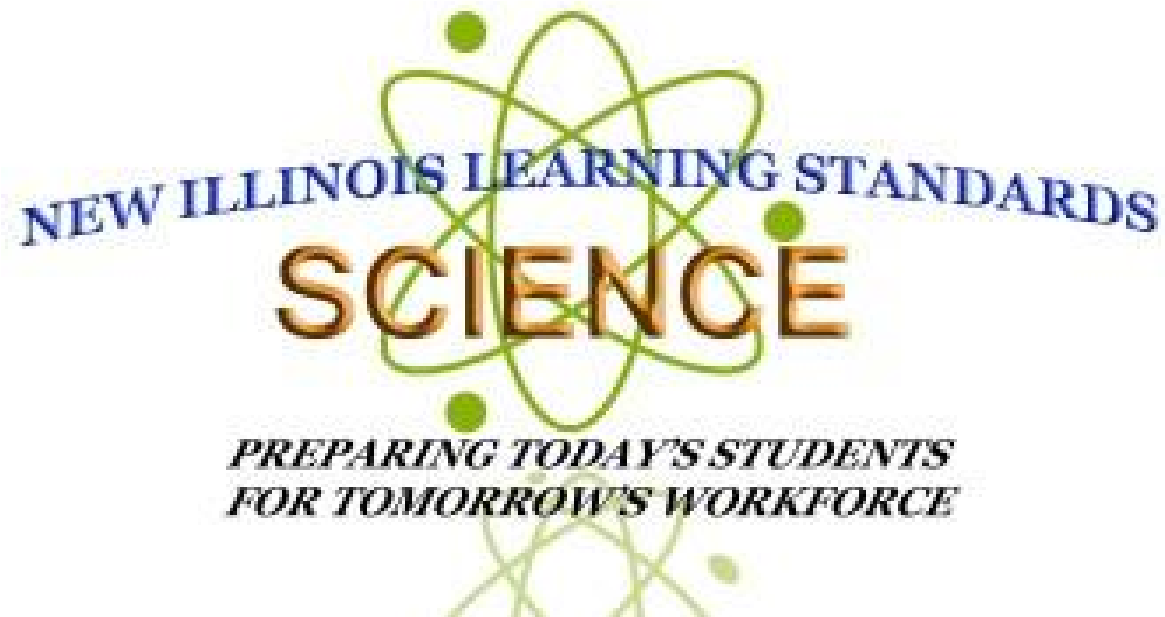
# District 228 Plan Towards Implementation

- 2014-2015
  - Side-by-Side curriculum comparison 4th - 8th grade
  - Teacher trainings
- 2015-2016
  - Teacher trainings
  - Teachers piloting NGSS lessons and activities
  - Looking at curriculum materials (**Foss** (\$12-\$18), **Discovery Education** (\$15-\$17), Pearson (\$18-\$35), Project Lead the Way (\$11-\$16))
  - Administrative and teacher review of curriculum materials
  - **Selection of curriculum materials- Bring back for board approval**
  - Teacher training and preparation for the 2016-2017 school year
- 2016-2017
  - NGSS aligned curriculum
  - Update Atlas units of instruction



# Elementary STEM Labs





**Questions?**