You Want Me to Teach What??
Ways to Incorporate the NGSS in the Elementary Classroom

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Thank you for joining us today in our Breakout Session. We know how difficult simply teaching science at the elementary level can be. The curriculum behind NGSS asks us, as teachers, to present the same content, but in a way that is challenging to both the teacher and the students. Today, we will present how to begin to incorporate NGSS into your classroom. If you have any further questions about materials, presentation, content, etc. please do not hesitate to reach us at the email addresses listed above!

NGSS Website: https://www.nextgenscience.org/

Must have resource: A Framework for K-12 Science Education

State Science Assessment: 5th, 8th, and High School Biology
YouTube: Claim-Evidence-Reasoning by Matthew d’Alessio

Useful Websites

- http://www.ngssphenomena.com/
- Nextgenstoryline.org
- Phet.com
- http://sciencecases.lib.buffalo.edu/cs/
- http://concord.org/ngss/
- http://www.ngssphenomena.com/
- Veritasium on YouTube
- Ck12.org/ngss
- http://ambitiousscience-teaching.org/

Other Ideas:
**Kindergarten**

K-PS2-1 Motion and Stability: Forces and Interactions
Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

K-PS2-2 Motion and Stability: Forces and Interactions
Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*

K-LS1-1 From Molecules to Organisms: Structures and Processes
Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-ESS2-1 Earth's Systems
Use and share observations of local weather conditions to describe patterns over time.

K-ESS2-2 Earth's Systems
Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

K-ESS3-1 Earth and Human Activity
Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

K-ESS3-2 Earth and Human Activity
Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.*

K-ESS3-3 Earth and Human Activity
Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*

**1st Grade**

1-PS4-1 Waves and Their Applications in Technologies for Information Transfer:
Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

1-PS4-2 Waves and Their Applications in Technologies for Information Transfer:
Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.
1-PS4-3 Waves and Their Applications in Technologies for Information Transfer:
Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.

1-PS4-4 Waves and Their Applications in Technologies for Information Transfer:
Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.*

1-LS1-1 From Molecules to Organisms: Structures and Processes:
Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.*

1-LS1-2 From Molecules to Organisms: Structures and Processes:
Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

1-LS3-1 Heredity: Inheritance and Variation of Traits:
Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

1-ESS1-1 Earth's Place in the Universe:
Use observations of the sun, moon, and stars to describe patterns that can be predicted.

1-ESS1-2 Earth's Place in the Universe:
Make observations at different times of year to relate the amount of daylight to the time of year.

2-PS1-1 Matter and Its Interactions
Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

2-PS1-2 Matter and Its Interactions
Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.*

2-PS1-3 Matter and Its Interactions
Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
2-PS1-4 Matter and Its Interactions
Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

2-LS2-1 Ecosystems: Interactions, Energy, and Dynamics
Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-2 Ecosystems: Interactions, Energy, and Dynamics
Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*

2-LS4-1 Biological Evolution: Unity and Diversity
Make observations of plants and animals to compare the diversity of life in different habitats.

2-ESS1-1 Earth's Place in the Universe
Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

2-ESS2-1 Earth's Systems
Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*

2-ESS2-2 Earth's Systems
Develop a model to represent the shapes and kinds of land and bodies of water in an area.

2-ESS2-3 Earth's Systems
Obtain information to identify where water is found on Earth and that it can be solid or liquid.

3rd Grade

3-PS2-1 Motion and Stability: Forces and Interactions
Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

3-PS2-2 Motion and Stability: Forces and Interactions
Make observations and/or measurements of an object’s motion to provide evidence that a pattern can be used to predict future motion.
3-PS2-3 Motion and Stability: Forces and Interactions
Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

3-PS2-4 Motion and Stability: Forces and Interactions
Define a simple design problem that can be solved by applying scientific ideas about magnets.*

3-LS1-1 From molecules to Organisms: Structures and Processes
Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

3-LS2-1 Ecosystems: Interactions, Energy, and Dynamics
Construct an argument that some animals form groups that help members survive.

3-LS3-1 Heredity: Inheritance and Variation of Traits
Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

3-LS3-2 Heredity: Inheritance and Variation of Traits
Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-1 Biological Evolution: Unity and Diversity
Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

3-LS4-2 Biological Evolution: Unity and Diversity
Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

3-LS4-3 Biological Evolution: Unity and Diversity
Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4-4 Biological Evolution: Unity and Diversity
Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*

3-ESS2-1 Earth's Systems
Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
3-ESS2-2 Earth's Systems
Obtain and combine information to describe climates in different regions of the world.

3-ESS3-1 Earth and Human Activity
Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.*

4th Grade

4-PS3-1 Energy
Use evidence to construct an explanation relating the speed of an object to the energy of that object.

4-PS3-2 Energy
Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

4-PS3-3 Energy
Ask questions and predict outcomes about the changes in energy that occur when objects collide.

4-PS3-4 Energy
Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.*

4-PS4-1 Waves and Their Applications in Technologies for Information Transfer
Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

4-PS4-2 Waves and Their Applications in Technologies for Information Transfer
Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

4-PS4-3 Waves and Their Applications in Technologies for Information Transfer
Generate and compare multiple solutions that use patterns to transfer information.*

4-LS1-1 From Molecules to Organisms: Structures and Processes
Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
4-LS1-2 From Molecules to Organisms: Structures and Processes
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.

4-ESS1-1 Earth's Place in the Universe
Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

4-ESS2-1 Earth's Systems
Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-2 Earth's Systems
Analyze and interpret data from maps to describe patterns of Earth’s features.

4-ESS3-1 Earth and Human Activity
Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

4-ESS3-2 Earth and Human Activity
Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*

5th Grade

5-PS1-1 Matter and Its Interactions
Develop a model to describe that matter is made of particles too small to be seen.

5-PS1-2 Matter and Its Interactions
Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

5-PS1-3 Matter and Its Interactions
Make observations and measurements to identify materials based on their properties.

5-PS1-4 Matter and Its Interactions
Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

5-PS2-1 Motion and Stability: Forces and Interactions
Support an argument that the gravitational force exerted by Earth on objects is directed down.
5-PS3-1 Energy
Use models to describe that energy in animals’ food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

5-LS1-1 From Molecules to Organisms: Structures and Processes
Support an argument that plants get the materials they need for growth chiefly from air and water.

5-LS2-1 Ecosystems: Interactions, Energy, and Dynamics
Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

5-ESS1-1 Earth's Place in the Universe
Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.

5-ESS1-2 Earth's Place in the Universe
Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

5-ESS2-1 Earth's Systems
Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

5-ESS2-2 Earth's Systems
Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

5-ESS3-1 Earth and Human Activity
Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.