

NGSS Science

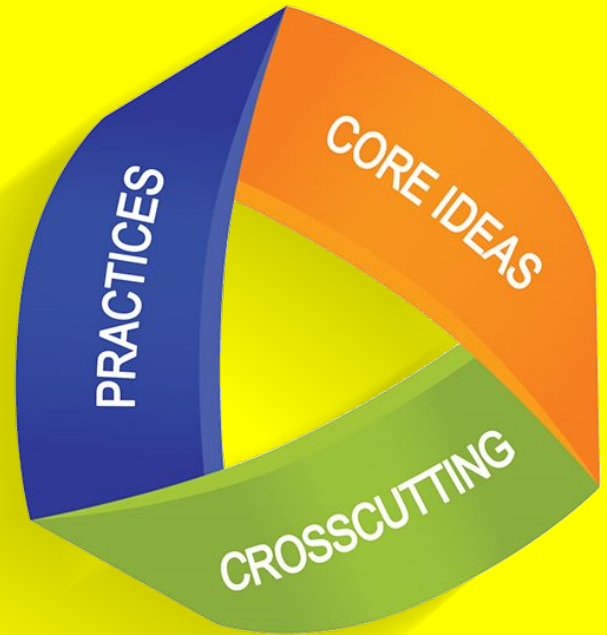
2017-2018 School Year



What does NGSS science look like?

Next Generation Science Standards include:

- Engineering and Design Practices
- Cross-cutting Concepts Across Areas of Science
 - Patterns
 - Models
 - Cause and Effect
- Disciplinary Core Ideas (Science Content)
 - Physical Science
 - Biological Science
 - Earth Science



What does NGSS science look like?

Images from
NSTA. "How Today's Students Learn Science." NGSS@NSTA, Jan. 2017,
ngss.nsta.org/Infographics.aspx.

DISCUSSING, EXPLAINING, AND USING EVIDENCE FOR IDEAS



IN THE GYM, BOBBY DEMONSTRATES AND EXPLAINS HIS IDEAS ABOUT ENERGY TRANSFER.

OBSERVING, POSING QUESTIONS, MAKING SENSE OF REAL-WORLD OBJECTS AND EVENTS (PHENOMENA)



IN PHYSICS CLASS, JENNY CAN'T WAIT TO INVESTIGATE WHAT MAKES HER HAIR STAND ON END.

What does NGSS science look like?

DESIGNING SOLUTIONS USING ENGINEERING AND TECHNOLOGY

DARN! I NEED TO
MODIFY MY DESIGN.

CRASH



SUCCESS! THIS DESIGN
SUPPORTS MORE WEIGHT.

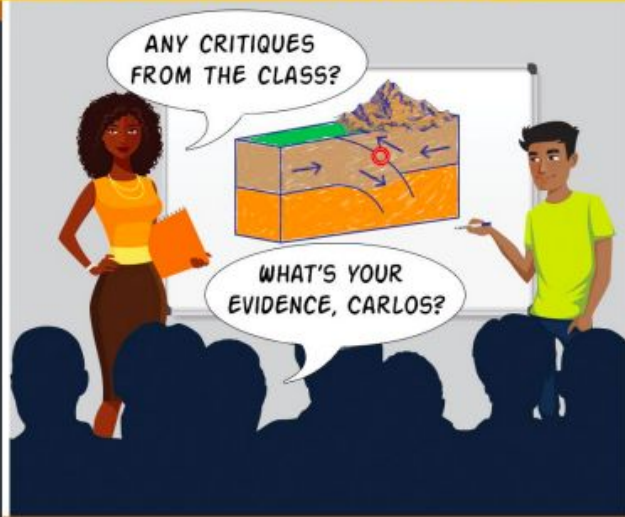
WROO



AFTER MANY DESIGN CHANGES, DEJA BUILT
THE STRONGEST BRIDGE IN THE CLASS.

What does NGSS science look like?

DEVELOPING MODELS TO EXPLAIN REAL-WORLD OBJECTS OR EVENTS



MEANWHILE, IN MS. STURGEON'S EARTH SCIENCE CLASS, CARLOS EXPLAINS HOW SOME MOUNTAINS FORM.

PLANNING AND CARRYING OUT INVESTIGATIONS AND ANALYZING DATA

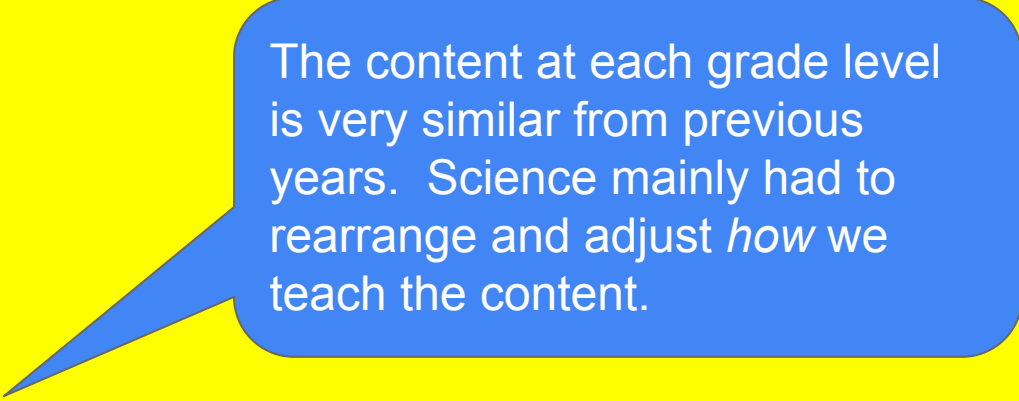


STUDENTS INVESTIGATE THE QUALITY OF WATER IN A NEARBY POND.

What does NGSS science look like?

Next Generation Lessons are:

- Hands-on
- Inquiry
- Engineering
- Problem Solving
- Modeling
- Driven by Phenomena



The content at each grade level is very similar from previous years. Science mainly had to rearrange and adjust *how* we teach the content.

6th Grade Science Classes

What's new or redesigned?

- Helmet Engineering and Design Lab (Human Body)
- Ecology Unit
- Cell Division Design Challenge
- Cell Unit Redesigned
- Natural Selection Redesigned
- Finch Lab and Data Analysis
- HMM Science Dimension Workbooks

Helmet Engineering and Design Lab

Students design a helmet that protects the head and retest/modify it.

- Research concussions
- Treat a patient with a concussion
- Design a bike helmet
- Test and redesign their helmets

7th Grade Science Classes

What's new or redesigned?

- Waves
- Soundproof Box Design Challenge
- Modeling Systems in Space
- Weathering and Erosion Labs
- Images of Change
- Natural Disaster Research Project
- Research Based Earthquake-proof Buildings
- Redesigned Cow Eye Dissection
- HMH Science Dimension Workbooks

Modeling the Solar System

Students select from a variety of materials a way to accurately represent the solar system to scale.

EXAMPLE

Modeling the Earth /Moon System Choices

- Golf ball
- Tennis ball
- Ball bearing
- Basketball

Acting out phases, eclipses, and seasons.

Earthquake- Proof Building Challenge

Students have to research earthquake-proof building modifications and construct a building than can withstand an earthquake.

CRITERIA & CONSTRAINTS

- 30 centimeters tall
- Carry mass of 200 grams
- Shake for 10 seconds
- Budget of \$900
- Research-based
- Limited materials

8th Grade Science Classes

What's new or redesigned?

- Helicopter Engineering Design Lab
- Sanitation Field Trip During the Environmental Science Unit
- Electromagnet Design Lab
- New Weather Standards
- Anemometer Activity
- Water Filtration Design Lab
- Law of Conservation of Mass
- HMH Science Dimensions Workbooks

Electromagnet Design Lab

What affects the strength of an
electromagnet?

VARIABLES:

- Manipulate iron core
- Number of coils
- Wire gauge

Water Purification Design Lab

Create a water filter system that
cleans water.

VARIABLES:

- Sand
- Gravel
- Filter paper
- Charcoal
- Funnels