

Honors 7th Grade Science

2014-15 Proposed Syllabus

Mission Statement

The primary focus of the Honors Science Class at Glassboro Intermediate School is to help academically talented students achieve at their optimal level. Students will be in a classroom that is ripe with academic rigor, higher-level thinking, challenging activities and critical thinking and problem solving situations. The goal is to create a class of like-minded, dedicated students who are willing to work hard and challenge themselves.

How are students identified?

1. All students were given the opportunity to complete an interest essay where they were made aware of the criteria for 7th grade honors science.
2. NJ ASK Scores in Math and Language Arts – must be proficient
3. Map Scores
4. Teacher Recommendation
5. Overall grades

Description of Class Overview

7th grade honors science will follow the same core curriculum but with added rigor, additional assignments, acceleration and higher expectations. There is the potential for students to receive more homework, outside reading and independent assignments. Classes will move at a faster pace, with more time for discussion and reflection; this will include a non-fiction selection that students will read at home. Honors students will be able to investigate engineering design challenges in more detail than the other 7th grade students and be introduced to the STEM field.

Curriculum

Students in 7th grade honors science will cover topics in Life and Earth Sciences.

Unit 1: Forces Shaping the Earth

Ch. 10/11 – Glencoe Science Level Red – Integrated: In this unit, students will understand the interactions among Earth's layers, and how major geologic events like volcanoes and earthquakes have shaped its surface. They will investigate evidence for the theory of plate tectonics and be exposed to magnetism and how it is used for navigation. Students will understand what processes go into the formation of soil, and that soils are found in layers, with different chemical compositions and textures. They will also learn that landforms are created through Earth processes like weathering and erosion.

Labs:

Formation of a Volcano

Convection Currents in Action

Sea-Floor Spreading

Exploration of Magnetic Fields

Volcanoes Webquest (honors)

Watching For Weathering (honors will create portfolio of weathering in community)

Soil Sample and pH (honors will collect soil samples and test planting capabilities of different types)

Chemical and Mechanical Weathering Lab (honors will investigate pH in greater detail including making own pH paper)

Projects:

Model Earth's Layers (and their interactions for honors)

Theory of Plate Tectonics Presentations (honors will present using technology)

Current Events Presentations (honors)

Design own test review (honors)

STEM and Environmental Issues:

Introduce STEM field and engineering as a profession

Tall Tower Challenge (STEM) and self assessment

Soil Erosion (honors)

Unit 2 – Atmosphere and Weather

In this unit, students will learn that Earth's atmosphere is a mixture of gasses including water vapor and that it is layered with different physical and chemical compositions at each layer. They will understand that the sun is the Earth's primary source of energy and drives convection in the atmosphere. This uneven heating causes energy that results in wind, ocean currents and storms. They will learn that water in the oceans holds large amounts of heat and affects global climate. Differences between climate and weather will be addressed.

Labs:

Transpiration in plants

Rates of evaporation

Water Cycle Webquest

Model Sunlight on Earth

Weather Observation and tracking (honors)

Projects:

Water Cycle Video (honors)

Weather Forecast and Climate Presentation (honors use of technology)

Environmental Issues/STEM

Water Usage Data (honors)

Alternative Energy Research (honors)

Wind Turbine Design (STEM) and self-assessment

Global Warming and Greenhouse effect (honors)

Unit 3 – History of Earth and Evolution

In this unit, students will understand that the complexity of life has changed over time and that today's Earth is very different than early Earth. They will explore anatomical evidence for evolution including fossils and how they provide evidence of how life and environmental conditions have changed. They will investigate the principles of natural selection and how organisms adapt, including species which have not been able to adapt to changing environmental conditions and therefore became extinct.

Labs:

Bean Variation

Peppered Moths

Bird Beak/Variation/Adaptation/Survival of the Fittest

Fossil Virtual Lab (honors)

Interactive Timeline (honors)

Imprint Fossil

Projects:

Research Darwin and Origin of Species (honors)

Species Research (honors)

Environmental Issues/STEM

Extinction caused by humans

Toxic Popcorn (STEM)

Texts and Additional Teacher Resources

Glencoe Science Level Red: Integrated Science

Glencoe Earth Science

Glencoe Life Science

Glencoe Science Critical Thinking/Problem Solving: Life Science

Glencoe Science Critical Thinking/Problem Solving: Earth Science

Glencoe Science Mathematics Skill Activities

Proposed Budget for Honors Curriculum

\$500 –

*to be used toward purchase of class set of “The Boy Who Harnessed the Wind” by William Kamkwamba and Bryan Mealer

*for potential honors field trip to PSEG Education center, Academy of Natural Sciences or Fossil Dig

*for lab materials as needed